

CAR – 66

LICENCING OF AIRCRAFT MAINTENANCE ENGINEERS

DIRECTORATE GENERAL OF CIVIL AVIATION
TECHNICAL CENTRE, OPP SAFDARJUNG AIRPORT, NEW DELHI

Issue III, Rev 3 dated 29 October 2026

Salient Features of the CAR-66

The CAR-66

- has been drafted in line with the current rule 61 of Aircraft Rule 1937 and to harmonise the aircraft maintenance personnel licensing system with EASA Part 66 (General).
- details, requirements for qualifying an individual to obtain an Aircraft MaintenanceEngineer's Licence and extension of such licence [CAR-66]
- eliminates the system of obtaining Airframe, Engine, Electrical, Instrument and Radio System Licences separately [66.A.03]
- redefines the syllabus for basic knowledge examination in modular pattern [66.A.25]
- provides for endorsement of an AME licence after successful completion of type training and the type training examination/type examination which shall consist of both theoretical and practical examinations [66.A.45 (c)]
- lists the details of practical tasks to qualify an individual to obtain a type rating [Appendix II to AMC]
- provides for acquiring group type rating of aircraft and certification privileges [66.A.45 (a)]
- has a provision to convert the existing AME licence to CAR 66 licence [66.A.70] with or without limitation.

GENERAL

In order to harmonize Indian requirements for licencing of aircraft maintenance engineers with international requirements; CAR-66 Rev.0 dated 11th November 2011, was introduced.

This CAR is issued on the basis of amended Rule 61 of aircraft rules, 1937 *(G.S.R. No.289 (E) dated 08.04.2022).*

The CAR-66 is applicable to all personnel/ Organizations engaged in maintenance and/or certification of aircraft registered in India.

The Section A of CAR-66 establishes the requirements for the issue and extension of an aircraft maintenance engineer's license, conditions of its validity and use. It also has a provision for converting the aircraft maintenance engineer's (AME) license issued prior to the CAR-66 coming into force. The requirements are followed by Acceptable means of compliance (AMC) and Guidance Material (GM)

The AME licenses in CAR 66 pattern are available in two different ways:

a. After conversion of pre-CAR 66 AME licenses with applicable limitation.
b. Issue of fresh license after passing of applicable modules of Basic Knowledge Exam conducted by CEO.

Record of Revisions

Initial Issue (Revision 0) 11th November 2011

This CAR 66 provides requirements for the issue of an aircraft maintenance engineer's licence and conditions of its validity and use for aeroplanes and helicopters.

Revision 1, 23rd April 2015

The Revision-01 to CAR 66 was issued to revise conversion of licences issued prior toCAR-66 and examination credits. The revision also revises the License format.

CAR 66 Issue II, 4th April 2016

The CAR 66 Issue II is being issued to amend the training, examination, knowledge andexperience requirements for the issuance of aircraft maintenance licences

Salient features of the CAR 66 Issue II are:

1. The training, examination, knowledge and experience requirements for the issuance ofaircraft maintenance licences and to adapt these requirements to the complexity of the different categories of aircraft amended
2. The AMCs and GMs related to a point have been brought together for easy referencepurposes.
3. Provision for aircraft grouping added (66.A.5)
4. Requirements for completing all the module for basic knowledge within 10 year(66.A.25 (b)) added
5. Heading of (66.A.45) is changed from type /task training to Endorsement with aircraftrating. Related AMC and GM amended.
6. Point 66. A. 50 and related AMC added to make a provision for introducing or removalof limitation from the license
7. Existing AMCs and GMs are suitable amended.
8. Appendix -1- Basic knowledge requirements amended to revise the syllabus forknowledge examination
9. Appendix -2 -Basic examination standard have been revised
10. Appendix-3- Type examination standard have been amended, minimum standard and duration for type training, course curriculum have been introduced, practical elements requirements to be covered during type training added, type training examinations and assessment standard have been revised, relevant AMC and GM have been also amended/added.
11. Appendix-III to AMC of CAR 66 for competency assessment of assessors added.
12. Procedures for CAR -66 (Section –B) is removed from this CAR and shall be part of Airworthiness Procedures Manual (Chapter- 17)

CAR Issue II Revision 1, 10th February 2017

The Revision-01 to CAR 66 Issue II is proposed to be issued to incorporate amendments made in rule 61 of the Aircraft Rules. 1937 published vide GSR 911 (E) dated 16-9-2016.Salient revision in the CAR as follows:-

1. CAR 66.A.3 In the existing AME licence category, category B3 is introduced forcertifying unpressurised piston engine aircraft below 2000kgs MTOW.
2. Provision has been made for issue of Category A licence without type rating
3. 66. A. 20 privileges of AME licence has been replaced with new one in line with rule 61.
4. 66.A.30 Aircraft Maintenance Experience requirements of issue of Category A, B1.2and B 1.4 has been revised to 3 years.
5. Related paragraph in this CAR revised to include new category B3 where everrequired.
6. 66.A.45 endorsement on AME licence for aircraft ratings has been revised suitablyto include category B3 requirement.
7. Appendix –I Basic knowledge requirement has been revised to include syllabus forcategory B3.
8. Requirements for certifying staff engaged in certification of aircraft components aredetailed in Subpart C (Component).
9. Application and format are separated from the main CAR and published in the formsection on DGCA website.

CAR Issue II Revision 2, 4th September 2017

The salient features of this revision are as follows:

1. 66.A.35 amended to replace skill test requirement with demonstration of skill.
2. 66.A.215 (b) amended to include AME Course.
3. Appendix –II (Basic Examination Standard) para 1.5 amended to make provision forappearing in failed module related to limitation papers from 90 days to 30 days.
4. GM 66.A.35 (Skill Test Requirements) – Deleted.
5. Appendix-I (Appendices to AMC for CAR 66) amended to add a note on Type rating endorsement covering several models/ variant. Group 1 Helicopter Table amendedin line with EASA guidelines.

CAR Issue II Revision 3, 16th November 2018

The salient features of this revision are as follows:

1. Appendix 1 to AMC published separately.

CAR Issue II Revision 4, 5th February 2019

The salient features of this revision are as follows:

1. AMC 66.A.30(a) amended to incorporate amendment to Rule 61 of the Aircraft Rules 1937 published vide GSR 1066(E) dated 25-10-2018.

CAR Issue II Revision 5, 03rd December 2019

The salient features of this revision are as follows:

1. Appendix 1 to AMC published separately.

CAR Issue II Revision 6, 6th April 2021

The salient features of this revision are as follows:

1. Appendix 1 to AMC published separately.

CAR Issue II Revision 7, 7th February 2022

The salient features of this revision are as follows:

1. Reference of eGCA introduced at relevant places.
2. The requirements for endorsement of the full group 3 rating has been revised.
3. The requirements for endorsement of the rating 'piston-engine non-pressurised aeroplanes of 2000 kg MTOM and below' has been revised.
4. Appendix VI(a) - Aircraft Maintenance Engineer's Licence (PLASTIC CARD) format [issued through eGCA] has been added.
5. The definition of "designated assessors appropriately qualified" and its approval process has been revised as per AAC 04 of 2017.
6. Note added under 'DGCA application forms for licenses and examinations'.

CAR Issue II Revision 8, 20th April 2022

The salient features of this revision are as follows:

1. Appendix 1 to AMC published separately.

CAR Issue III, Revision 0, April 2024

The salient features of this issue are as follows:

1. Harmonize CAR 66 with the EASA Part 6 (Annex III dated 18-05-2021 and AMC/GM to Annex III dated 02-12-2022) and Rule 61 of Aircraft Rules 1937 (G.S.R. No. 289(E) dated 08.04.2022).

2. Requirement of issue of licence in the category "B2L" and category "L" have been added.

3. The maintenance experience logbook format added.

4. The requirements, related AMCs and GMs have been brought together for easy reference purposes.

CAR Issue III, Revision 1, 18th December 2024

The revision has been issued to remove Module 1L appearing in the 'Table of Contents' under Appendix VII — Basic Knowledge Requirements for Category L Aircraft Maintenance Licence and thereby removes the inconsistency in the previous issue of the CAR

CAR Issue III, Revision 2, September 2025

CAR 66 is amended to harmaonized with recent changes incorporated in EASA Part 66 (Annex III – of Regulation (EU) No 1321/2014) dated 12.07.2024 which is amended to incorporate changes as per EASA IMPLEMENTING REGULATION (EU) 2023/989 of 22 May 2023.

The salient features of this issue are as follows:

1. Requirement for issuance of Category C licence is amended to include the base maintenance experience.
2. Syllabus, modules level, number of question per modules are added and are rationalised as per EASA part 66 in Basic knowledge Examination requirement.
3. Skill test procedure (which is introduced in EASA as type evaluation) is also amended.
4. Requirement related to qualification of the Mentor and Designated assessor for On-Job Training (OJT) has been amended.
5. OJT procedure, requirements and list of OJT tasks are amended as per EASA Part 66.
6. Requirements related to renewal of licence for expired AME licence is amended

CAR Issue III, Revision 3, October 2026

CAR 66 has been revised in order to harmonize it with the EASA Part 66 (ANNEX II (Part-66)) to ED Decision 2023/019/R dated 20 Mar 2025, EASA User Guide Doc UG.CAO.00126-004

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SECTION A

Technical Requirements

SUBPART A

AIRCRAFT MAINTENANCE ENGINEER'S LICENCE AEROPLANES AND HELICOPTERS

66. A.01 Scope

This section defines the aircraft maintenance engineer's licence and establishes therequirements for application, issue and conditions of its validity

66. A.03 Licence categories

(a) Category A, divided into the following subcategories:

- A1 Aeroplanes Turbine;
- A2 Aeroplanes Piston;
- A3 Helicopters Turbine;
- A4 Helicopters Piston.

(b) Category B1, divided into the following subcategories:

- B1.1 Aeroplanes Turbine;
- B1.2 Aeroplanes Piston;
- B1.3 Helicopters Turbine;
- B1.4 Helicopters Piston.

(c) Category B2, applicable to all aircraft.

(d) Category B2L

Category B2L shall be issued with the 'system rating' for aircraft other than those in Group 1 (66.A.05(1)) as specified below:

- Communication/Navigation (Com/Nav),
- Instruments,
- Autoflight,
- Surveillance,
- Airframe systems.

A B2L licence shall contain, as a minimum, one system rating.

(e) Category B3

Category B3 licence is applicable to piston-engine non-pressurised aeroplanes of 2 000 kg Maximum Take-off Mass (MTOM) and below.

(f) Category L, divided into the following subcategories:

- L1C: composite sailplanes;
- L1: sailplanes;
- L2C: composite powered sailplanes and composite Light Aircraft 1 (LA1) aeroplanes;
- L2: powered sailplanes and Light Aircraft 1 (LA1) aeroplanes;
- L3H: hot-air balloons;
- L3G: gas balloons;
- L4H: hot-air airships;
- L4G: Light Aircraft 2 (LA2) gas airships; and
- L5: gas airships other than Light Aircraft 2 (LA2).

(g) Category C, applicable to aeroplanes and helicopters.

GM 66.A.03 Licence categories

Individual aircraft maintenance licence holders need not be restricted to a single category. Provided that each qualification requirement is satisfied, any combination of categories may be granted.\

1. Light aircraft 1 aircraft (LA1) means the following:

   (a) An aeroplane with a Maximum Take-off Mass (MTOM) of 1200 kg or less that is not classified as "complex motor-powered aircraft";

   (b) A sailplane or powered sailplane of 1200 kg MTOM or less;

   (c) A balloon with a maximum design lifting gas or hot air volume of not more than 3400 m^3 for hot air balloons, 1050 m^3 for gas balloons, 300 m^3 for tethered gas balloons;

   (d) An airship designed for not more than four occupants and a maximum design lifting gas or hot air volume of not more than 3400 m^3 for hot air airships and 1000 m^3 for gas airships;

2. Light Aircraft 2 aircraft (LA2) means the following:

   (a) An aeroplane with a Maximum Take-off Mass (MTOM) of 2000 kg or less that is not classified as "complex motor-powered aircraft";

   (b) A sailplane or powered sailplane of 2000 kg MTOM or less;

   (c) A balloon;

   (d) A hot airship;

   (e) A gas airship meeting all of the following elements:

      i. 3% maximum static heaviness,

      ii. Non-vectored thrust (except reverse thrust),

      iii. Conventional and simple design of: structure, control system and ballonet system

      iv. Non-power assisted controls;

(f) A Very Light Rotorcraft.

3. 'Gas airships other than LA2' refers to those gas airships which do not meet at least one condition of the definition of 'LA2 aircraft' that is contained in Para 2

NOTE: An aeroplane, meeting the MTOM requirements for LA 1 or LA 2 Category, is nevertheless classified as "complex motor-powered aircraft " when it is certificated for operation with a minimum crew of at least two pilots, or it is equipped with (a) turbojet engine(s) or more than one turboprop engine.

Note: The 'LA2 aircraft' category includes all 'LA1 aircraft'.

4. The term 'powered sailplane' includes:

- those powered sailplanes which may take off solely by means of their own power (self-launching sailplanes); and
- self-sustaining powered sailplanes; and
- touring motor gliders (TMGs).

5. While the L1C subcategory only includes composite sailplanes, the L1 subcategory includes all sailplanes (composite, metal and wood).

6. While the L2C subcategory only includes composite powered sailplanes and composite LA1 aeroplanes, the L2 subcategory includes all powered sailplanes and LA1 aeroplanes (composite, metal and wood).

7. In the case of maintenance of mixed balloons (combination of gas and hot air), it is required to hold both L3G and L3H subcategories.

8. For the B2L licence, a 'system rating' is a rating which gives privileges to release maintenance on the aircraft systems covered by the 'system rating' and electrical systems.

9. The sentence 'shall contain, as a minimum, one system rating' refers to the fact that the application for a B2L licence should be made for any of the system ratings or any combination of the system ratings specified in 66.A.03.

There is no specific order in which the system ratings should be applied for. Any combination of system ratings is possible.

The description of systems covered by the different system ratings is provided in Appendix I 'Basic Knowledge Requirements' under paragraph '2. Modularisation', subparagraph related to 'Categories B2 and B2L'.

66. A.05 Aircraft groups

For the purpose of ratings on aircraft maintenance engineers licences, aircraft shall be classified in the following groups:

1. Group 1: Complex motor-powered aircraft; multi-engine helicopters; other than piston-engine aeroplanes, with maximum certified operating altitude exceeding FL290; aircraft equipped with fly-by-wire systems; gas airships other than LA2.

   DGCA may decide to classify into Group 2, Group 3 or Group 4, as appropriate, an aircraft which meets the conditions set out in the first subparagraph, if it considers that the lower complexity of the particular aircraft justifies so.

2. Group 2: aircraft other than those in Group 1 belonging to the following subgroups:

   i. sub-group 2a:

   - single turbo-propeller engine aeroplanes
   - those turbine-engine aeroplanes classified by DGCA in this subgroup because of

their lower complexity

ii. sub-group 2b:

- single turbine engine helicopters
- those multiple turbine engine helicopters classified by DGCA in this subgroup because of their lower complexity.

iii. sub-group 2c:

- single piston engine helicopters.
- those multiple piston engine helicopters classified by DGCA in this subgroup because of their lower complexity.

3. Group 3: piston engine aeroplanes other than those in Group 1.

4. Group 4: sailplanes, powered sailplanes, balloons and airships, other than those in Group 1.

GM 66.A.05 Aircraft Groups

The following table summarizes the applicability of categories/subcategories of CAR-66 licences versus the groups/subgroups of aircraft:

Category/subcategory Groups/Sub-Groups	A, B1 and C	B2	B2L	B3	L				
					L1C and L1	L2C and L2	L3H and L3G	L4H and L4G	L5
Group 1 - Complex motor-poweredaircraft - Multi-engine helicopters - Aeroplanes above FL290 - Aircraft with fly-by-wire systems - Any other aircraft when defined by the Agency	X	X							
Group 1 — Gas airships other than LA2		X							X
Group 2 2a: Single turboprop aeroplanes2b: Single turbine helicopters 2c: Single piston helicopters	X	X	X						
Group 3 — Piston engine aeroplanes	X	X	X						
Group 3 — Piston engine aeroplanes (non-pressurised of 2 000 kg MTOM and below)	X	X	X	X					
Group 3 — LA1 piston engine aeroplanes	X	X	X	X		X			
Group 4 — Sailplanes — Powered sailplanes — Balloons — Airships not in Group 1		X X X X	X X X X		X	X X	X	X	X

66. A.10. Application

a) An application for an aircraft maintenance engineer's licence or change to such licence shall be made on CA Form 19 (Refer Appendix-V) (through eGCA) with necessary documents and fees to DGCA.

b) *Reserved*.

c) In addition to the documents required in points 66.A.10 (a) as appropriate, the applicant for any change to an existing aircraft maintenance engineer's licence shall submit his/her current original aircraft maintenance engineer's licence to the DGCA together with application.

d) Reserved

e) Reserved

f) Each application shall be supported by documentation to demonstrate compliance with the applicable theoretical knowledge, practical training and experience requirements at the time of application.

Note :

1) The CAR 66 Licences issued comply with ICAO standards and recommended practices as in para 5.1 and 5.2 of Chapter 5 of ICAO Annex 1 with regards to material and specifications.

2) With the implementation of eGCA, CAR 66 Licences are issued on a plastic card, as per the format given in Appendix VI(b). The detailed content of the licence are accessible through QR Code printed on the plastic card licence.

3) Earlier CAR 66 Licence were issued on first quality paper (booklet form) as per format given at Appendix VI(a). Such licences shall be converted into plastic card upon availing any licensing service through eGCA, subject to compliance with the applicable requirements of CAR-66.

AMC 66.A.10 Application

1. Maintenance experience should be written in a manner that the reader has a reasonable understanding of where, when and what maintenance constitutes the experience. A blank statement "X year's maintenance experience completed" is not acceptable. A log book of maintenance experience is required to be maintained in the desired format given in this CAR.

2. Applicants claiming the maximum reduction in 66.A.30 (a) total experience based upon having successfully completed approved basic training should include the certificate of approval with its validity schedule of the training establishment.

3. Applicants claiming reduction in 66.A.30 (a) total experience based upon having successfully completed technical training in an organization or institute recognized by DGCA as a competent organization or institute should include the relevant certificate of successful completion of training.

GM 66.A.10 (a) Application

When an application is made for a licence in the B2L category, the applicant should specify on the CA Form 19 (through eGCA):

- the system rating or the combination of system ratings the applicant applies for; and
- the aircraft rating,

Considering that according to 66.A.45 (e), a B2L licence endorsed with full subgroup 2b can be endorsed also with full subgroup 2c.

When applying for the addition of a system rating on a B2L licence, the applicant should provide together with the application, the demonstration of compliance with the experience requirements related to the system the applicant applies for.

When a B2L licence holder applies for the endorsement to add a new system rating, he/she needs to demonstrate the practical experience required by 66.A.30(a)(3) for the system rating but also the practical experience required by 66.A.45(e) and (f) in case the aircraft group is different.

When a B2L licence holder applies for the change of his/her B2L licence to the B2 category, he/she needs to:

- demonstrate by examination the differences between the basic knowledge corresponding to the B2L licence held and the basic knowledge of the B2 licence, as described in Appendix I; and
- demonstrate the additional experience relevant to the aircraft group/sub-group as described in Appendix IV.

When an applicant applies for the extension of his/her B2L licence to a B2 licence and he/she meetsthe relevant requirements, the B2L licence is replaced by the B2 licence.

66. A.15.Eligibility

a) The applicant must have passed 10+2 examination in Physics, Chemistry and Mathematics from a recognized board or university or its equivalent

b) An applicant for an aircraft maintenance engineer's licence shall be at least 18 years of age.

AMC 66.A.15 (a) Eligibility

Diploma in engineering recognizedby state technical education board where physics, chemistry and mathematics has been studied as subject, shall be considered as equivalent qualification**.**

To prove the equivalence to 10 +2, the applicant is required to submit a certificate from applicable board/University.

66.A.20 Privileges

a) The following privileges shall apply:

1. Category A licence holder to issue certificates for release to service after minor scheduled line maintenance and simple defect rectification within the limits of maintenance tasks specifically endorsed on the authorisation issued by a maintenance organisation approved under rule 133B and the certification privileges shall be restricted to the work carried out by the licence holder himself in the maintenance organization that issues the authorisation.
2. Category B1 licence holder to issue certificates for release to service and to act as support staff following the maintenance performed on aircraft structure, power-plant, mechanical and electrical systems; work on avionics system requiring simple tests to prove their serviceability and not requiring trouble shooting, in respect of an aircraft type endorsed on the licence.

NOTE: Category B1 shall include the appropriate sub-category of Category A;

3. Category B2 licence holder to issue —

(a) certificates of release to service and to act as support staff after maintenance on avionic and electrical systems; avionics and electrical task within powerplant and mechanical systems requiring only simple tests to prove their serviceability of aircraft type endorsed on the licence;

(b) certificates of release to service after minor scheduled line maintenance and simple defect rectification within the limits of tasks specifically endorsed on the certification authorisation issued by an approved maintenance organisation of aircraft type endorsed on the licence and this certification privilege shall be restricted to work that the licence holder has personally performed in the maintenance organisation which issued the certification authorisation and limitedto the rating already endorsed on the licence.

Note: The category B2 licence does not include any A sub-category.

4. Category B2L licence holder to issue certificates of release to service and to act as B2L support staff for maintenance performed on electrical systems; maintenance performed on avionics systems within the limits of the system ratingsspecifically endorsed on the licence, and when holding the 'airframe system' rating, performance of electrical and avionics tasks within power plant and mechanical systems, requiring only simple tests to prove their serviceability.

5. Category B3 licence holder to issue certificates of release to service and to act as B3 support staff for maintenance performed on aeroplane structure, engine and mechanical and electrical systems; and work on avionic systems requiring only simple tests to prove their serviceability and not requiring troubleshooting not requiring troubleshooting of 'piston-engine non-pressurised aeroplanes of 2000 kg Maximum Take-off Mass and below'.

6. Category L licenceholder to issue certificates of release to service and to act as category L support staff for the maintenance performed on aircraft structure, power plant and mechanical and electrical systems; work on radio, Emergency Locator Transmitters (ELT) and transponder systems;and work on other avionics systems requiring simple tests to prove their serviceability.

   Note1: Subcategory L2 includes subcategory L1. Any limitation to subcategory L2 in accordance with point 66.A.45 (h) becomes also applicable to subcategory L1.

   Note2: Subcategory L2C includes subcategory L1C.

7. Category C licence holders to issue certificates of release to service following base maintenance in respect of an aircraft of the type endorsed on the licence. The privileges apply to the aircraft in its entirety including all systems.

NOTE—Simple test means a test described in approved maintenance data and suchin nature that aircraft system serviceability is verified through aircraft controls, switches, Built-in Test Equipment (BITE), Central Maintenance Computer (CMC) or external test equipment not requiring special training." ;

b) The holder of Aircraft Maintenance Engineer license may not exercise certification privileges unless:

1. in compliance with the applicable requirements of CAR M, CAR –ML, CAR – CAO and/or CAR 145 ; and
2. in the preceding two year period he/she has either acquired six months of maintenance experience in accordance with the privileges granted by the AircraftMaintenance Engineer's Licence or met the provision for the issue of appropriate privileges; and
3. he/she has the adequate competence to certify maintenance on the correspondingaircraft; and
4. he/she is able to read, write and communicate to an understandable level in the language(s) in which the technical documentation and procedures necessary to support the issue of the certificate of release to service are written.

GM 66.A.20 (a) Privileges

1. The following definitions apply:

Electrical system means the aircraft electrical power supply source, plus the distribution system to the different components contained in the aircraft and relevantconnectors. Lighting systems are also included in this definition. When working on cables and connectors which are part of these electrical systems, the following typicalpractices are included in the privileges:

- Continuity, insulation and bonding techniques and testing;
- Crimping and testing of crimped joints;
- Connector pin removal and insertion;
- Wiring protection techniques.

Avionics system means an aircraft system that transfers, processes, displays or stores analogue or digital data using data lines, data buses, coaxial cables, wireless orother data transmission medium, and includes the system's components and connectors. Examples of avionics systems include the following:

- Autoflight;
- Communication, Radar and Navigation;
- Instruments (see NOTE below);
- In-Flight Entertainment Systems;
- Integrated Modular Avionics (IMA);
- On-Board Maintenance Systems;
- Information Systems;
- Fly-by-Wire Systems (related to ATA27 "Flight Controls");
- Fibre Optic Control Systems.

NOTE: Instruments are formally included in the privileges of the B2 and B2L with system rating 'instruments'. However, maintenance on electromechanical and pitot-static components may also be released by a B1, B3 or L license holder.

Simple test means a test described in approved maintenance data and meeting all the following criteria:

- The serviceability of the system can be verified using aircraft controls, switches, Built-in Test Equipment (BITE), Central Maintenance Computer (CMC) or externaltest equipment not involving special training.
- The outcome of the test is a unique go–no go indication or parameter, which can be a single value or a value within an interval tolerance. No interpretation of the test result or interdependence of different values is allowed.
- The test does not involve more than 10 actions as described in the approved maintenance data (not including those required to configure the aircraft prior to the test, i.e. jacking, flaps down, etc., or to return the aircraft to its initial configuration). Pushing a control, switch or button, and reading the corresponding outcome may be considered as a single step even if the maintenance data shows them separated.

Troubleshooting means the procedures and actions necessary using approved maintenance data,

in order to identify the root cause of a defect or malfunction. It may include the use of BITE or external test equipment.

Line maintenance: Refer to AMC 145.A.10

Base Maintenance: Refer to AMC 145.A.10

2. The category B3 licence does not include any A subcategory. Nevertheless, this does not prevent the B3 licence holder from releasing maintenance tasks typical of the A1.2subcategory for piston-engine non-pressurized aeroplanes of 2000 kg MTOM and below, within the limitations contained in the B3 licence.
3. The B1.2 and B3 licences do not include any L subcategory. Nevertheless, a holder of an aircraft maintenance licence in subcategory B1.2 endorsed with the Group 3 rating or in category B3 endorsed with the rating 'piston engine non-pressurised aeroplanes of 2 000 kg MTOM and below', shall be issue, upon application, a licence in subcategories L1 and L2, with the same limitations as the B1.2/B3 licence held.
4. The privileges of the B2 licence with given aircraft ratings include the privileges of the B2L licence for all the system ratings for the same aircraft ratings. Nevertheless, the holder of a B2 licence with given aircraft ratings may apply for a B2L licence in order to include a different aircraft rating if the applicant only wants to demonstrate compliance with the experience requirements for certain system ratings.
5. The category C licence permits certification of scheduled base maintenance by the issue of a single certificate of release to service for the complete aircraft after the completion of all such maintenance. The basis for this certification is that the maintenance has been carried out by competent mechanics and category B1, B2, B2L, B3 and L support staff, as appropriate, have signed for the maintenance tasks under their respective specialization. The principal function of the category C certifying staff is toensure that all required maintenance has been called up and signed off by the category B1, B2, B2L, B3 and L support staff, as appropriate, before issue of the certificate ofrelease to service. Only category C personnel who also hold category B1, B2, B2L, B3 or L qualifications may perform both roles in base maintenance.

AMC 66.A.20(a)(4) Privileges

'Within the limits of the system ratings specifically endorsed on the licence' refers to the fact that the privileges of the licence holder are limited:

- to the group/subgroup of aircraft endorsed on the licence, but also
- to the system rating(s) endorsed.

When an applicant wishes to get the privilege to issue certificates of release to service and to act as support staff for electrical and avionics tasks within powerplant and mechanical systems, he/she should apply for the rating 'airframe system' on the B2L licence. The reason is that the 'airframe systems' rating is the only rating which covers completely the electrical and avionics tasks of the powerplant and mechanical systems of the aircraft.

AMC 66.A.20 (b) (2) Privileges

The 6 months of maintenance experience in the preceding 2-year period should be understood as consisting oftwo elements, duration and nature of the experience. The minimum to meet the requirements for these elements may vary depending on the size and complexity of theaircraft and type of operation and maintenance.

1. Duration:

Within an approved maintenance organization:

- 6 months of continuous employment within the same organisation; or
- 6 months split up into different blocks, employed within the same or in different organisations.

The 6 months period can be replaced by 100 days of maintenance experience in accordance with the privileges, whether these have been performed within an approved organisation or as independent certifying staff according to M.A.801(b)1, or as a combination thereof.

When licence holder maintains and releases aircraft in accordance with M.A.801(b)1, in certain circumstances this number of days may even be reduced by 50% when agreed in advance by DGCA. These circumstances consider the cases where the holder of a CAR-66 licence happens to be the owner of an aircraft and carries out maintenance on his own aircraft, or where a licence holder maintains an aircraft operated for low utilization, that does not allow the licence holder to accumulate therequired experience. This reduction should not be combined with the 20% reductionpermitted when carrying out technical support, or maintenance planning, continuing airworthiness management or engineering activities. To avoid a too long period without experience, the working days should be spread over the intended 6 months period.

2. Nature of the experience:

Depending on the category of the aircraft maintenance engineer's licence, the following activities are considered relevant for maintenance experience:

- Servicing;
- Inspection;
- Operational and functional testing;
- Trouble-shooting;
- Repairing;
- Modifying;
- Changing component;
- Supervising these activities;
- Releasing aircraft to service.

For category A licence holder, the experience should include exercising the privileges, by means of performing tasks related to the authorization on at least one aircraft type for each licence subcategory. This means tasks as mentioned in AMC 145.A.30 (g), including servicing, component changes and simple defect rectifications.

For category B1, B2 , B2L, B3 and L, for every aircraft type rating included in the authorization the experience should be on that particular aircraft or on a similar aircraft within the same licence (sub) category. Two aircraft can be considered to be similar when they have similar technology, construction and comparable systems, which means equally equipped with the following (as applicable to the licence category):

(a) Propulsion systems (piston or turboprop or turbofan or turboshaft or jet-engineor push propellers); and

(b) Flight control systems (only mechanical controls or hydro-mechanically poweredcontrols or electro-mechanically powered controls); and

(c) Avionic systems (analog systems or digital systems); and

(d) Structure (manufactured of metal or composite or wood).For licenses endorsed with (sub)

group ratings:

- In the case of B1 licence endorsed with (sub) group ratings (either manufacturer sub group or full (sub) group) as defined in 66.A.45 the holder should show experience on at least one aircraft type per (sub) group and per aircraft structure (metal, composite, wood).
- In the case of a B2 or B2L licence endorsed with (sub) group ratings (either manufacturer group or full (sub) group) as defined in 66.A.45 the holder should show experience on at least one aircraft type per (sub) group.
- In the case of a B3 licence endorsed with the rating 'piston-engine non-pressurizedaeroplanes of 2000kg MTOM and below' as defined in 66.A.45, the holder should show experience on at least one aircraft type per aircraft structure (metal, metal-tubing with fabric ,composite, wooden).

For category C, the experience should cover at least one of the aircraft types endorsed on the licence.

For a combination of categories, the experience should include some activities of the nature shown in paragraph 2 in each category.

A maximum of 20% of the experience duration required may be replaced by the following relevant activities on an aircraft type of similar technology, construction and with comparable systems:

- Aircraft maintenance related training as an instructor/assessor or as a student;
- Maintenance technical support/engineering;
- Maintenance management/planning.

The experience should be documented in an individual log book or in any other recording system (which may be an automated one) containing the following data:

(a) Date and time (24 Hrs UTC format);

(b) Place;

(c) Aircraft & Engine type;

(d) Aircraft identification i.e. registration (A/c Reg.- ….);

(e) ATA chapter;

(f) Work order number;

(g) Operation performed e.g. 100 FH check, MLG wheel change, engine oil check and complement, SB embodiment, trouble shooting, structural repair, STC embodiment…;

(h) Type of maintenance i.e. base(B), line(L);

(i) Type of activity i.e. perform(P), supervise(S), release(R);

(j) Category /Subcategory used (A1, A2, A3, A4, B1.1, B1.2, B1.3, B1.4, B2, B2L, B3, C or L1, L1C, L2, L2C,L3G, L3H, L4G, L4H, L5);

(k) Duration in hours or days

(l) Signature and stamp of certifying staff.

Note: The above details may be printed on the first page of the individual logbook to guide the candidates to fill the required data in the format given below:

Work logbook format:

Date & Time (24 Hrs UTC)	Place	Aircraft & Engine type	A/c Reg.-….	ATA	Work order no.	Task performed	B/L	P/S/R	Cat/Sub-cat.	Duration (Hrs/ days)	Signature & stamp of certfying staff

Name……..…… AME licence no./BAMEL no./Computer no.....…..…….
Signature..…….…… Page no.……

GM 66.A.20 (b) 2 Privileges

The sentence "met the provision for the issue of the appropriate privileges" included in 66.A.20(b)2 means that during the previous 2 years the person has met all the requirements for the endorsement of the corresponding aircraft rating (for example, in the case of aircraft in Group 1, theoretical plus practical element plus, if applicable, on- the-job training). This supersedes the need for 6 months of experience for the first 2 years. However, the requirement of 6 months of experience in the preceding 2 years willneed to be met after the second year.

AMC 66.A.20 (b) 3 Privileges

The wording "has the adequate competence to certify maintenance on the corresponding aircraft" means that the licence holder and, if applicable, the organisation where he/she is contracted/employed, should ensure that he/she has acquired the appropriate knowledge, skills, attitude and experience to release the aircraft being maintained. This is essential because some systems and technology present in the particular aircraft being maintained may not have been covered by the training/examination/experience required to obtain the licence and ratings.

This is typically the case, among others, in the following situations:

- Type ratings which have been endorsed on a licence in accordance with AppendixI to AMC to CAR-66 "List of Type Ratings" after attending type training/on-the-jobtraining which did not cover all the models/variants included in such rating. For example, a licence endorsed with the rating Airbus A318/A319/A320/A321 (CFM56) after attending type training/on-the-job training covering only the Airbus 320 (CFM56).

- Type ratings which have been endorsed on a licence in accordance with AppendixI to AMC to CAR-66 "List of Type Ratings" after a new variant has been added to the rating in Appendix I, without performing difference training. For example, a licence endorsed with the rating Boeing 737-600/700/800/900 for a person whoalready had the rating Boeing 737-600/700/800, without performing any difference training for the 737-900.
- Work being carried out on a model/variant for which the technical design and maintenance techniques have significantly evolved from the original model used in the type training/on-the-job training.
- Specific technology and options selected by each customer which may not have been covered by the type training/on-the-job training.
- Changes in the basic knowledge requirements of Appendix I to CAR -66 not requiring reexamination of existing licence holders (grandfathered privileges).
- The endorsement of group/subgroup ratings based on experience on a representative number

of tasks/aircraft or based on type training/examination ona representative number of aircraft.

- Persons meeting the requirements of 6 months of experience every 2 years only on certain similar aircraft types as allowed by AMC 66.A.20(b)2.
- Persons holding a CAR-66 licence with limitations, obtained through conversion of pre-existing qualifications (66.A.70), where such limitations are going to be lifted after performing the corresponding basic knowledge examinations. In this case, the type ratings endorsed in the licence may have been obtained without coveringall the aircraft systems (because of the previous limitations) and there will be needto assess and, if applicable, to train this person on the missing systems.

Additional information is provided in AMC 145.A.35 (a).

GM 66. A. 20 (b) 4 Privileges

1. Holders of a CAR-66 aircraft maintenance licence may not exercise certification privileges unless they have a general knowledge of the language used within the maintenance environment including knowledge of common aeronautical terms in thelanguage. The level of knowledge should be such that the licence holder is able to:
   - read and understand the instructions and technical manuals in use within the organisation;
   - make written technical entries and any maintenance documentation entries, which can be understood by those with whom they are normally required to communicate;
   - read and understand the maintenance organisation procedures;
   - communicate at such a level as to prevent any misunderstanding when exercisingcertification privileges.
2. In all cases, the level of understanding should be compatible with the level of certification privileges exercised.

66. A.25 Basic Knowledge requirements:

a) The applicant for an aircraft maintenance licence shall demonstrate by examination a level of knowledge of the related subject modules in accordance with Appendix I (applicable to categoryA, B1, B2, B2L, B3 and C licences) or Appendix VII (applicable to category L licences).

b) The basic knowledge examinations shall comply with the standard set out in Appendix II(applicable to category A, B1, B2, B2L, B3 and C licences) or Appendix VIII (applicable to category L licences) to this CAR and shall be conducted by DGCA.

c) The training courses and examinations shall be passed within 10 years prior to the application for an aircraft maintenance licence or the addition of a category or subcategory to such aircraft maintenance licence. Should this not be the case, examination credits may however be obtained in accordance with point (d).

   The 10 years' validity requirement applies to each individual module examination, except for those module examinations which were already passed as part of another licence category and the licence has already been issued.

d) The applicant may apply to DGCA for full or partial examination credit to the basicknowledge requirements for

   1. basic knowledge examinations that do not meet the requirement described in point (c) above; and
   2. any other technical qualification considered by DGCA to be equivalent to the knowledge standard of CAR-66

Credits shall be granted in accordance with APM Chapter 17.

e) Credits expire 10 years after they were granted to the applicant by DGCA. The applicant may apply for new credits after expiration.

f) The holder of an aircraft maintenance licence applying for the addition of a different category or subcategory shall complement by examination the level of knowledge that is appropriate to the related subject modules in accordance with Appendix I (for category A, B1, B2, B2L, B3 and C licences) or Appendix VII (for category L licences).

Appendix IV details the modules of Appendix I (for category B1, B2, B2L, B3 and C licences) or Appendix VII (for category L licences) required for the addition of a new category or subcategory to an existing licence issued in accordance with this CAR

GM 66.A.25 (a) Basic knowledge requirements

The levels of knowledge for each licence (sub) category are directly related to the complexity of the certifications related to the corresponding licence (sub)category, which means that category A should demonstrate a limited but adequate level of knowledge, whereas category B1, B2, B2L and B3 should demonstrate a complete level of knowledge in the appropriate subject module.

66. A.30 Basic Experience requirements:

a) An applicant for an aircraft maintenance engineer's licence shall have acquired:

1. for category A, sub categories B1.2 and B1.4 and category B3:

(i) three years of practical aircraft maintenance experience on operating aircraft; or

(ii) two years of practical maintenance experience on operating aircraft and having acquired a Degree in Aircraft Maintenance or Degree in Engineering from a recognised University; or

(iii) one year of practical maintenance experience on operating aircraft and having successfully completed basic aircraft maintenance training conducted by a training organisation approved under rule 133B

2. for sub-categories B1.1 and B1.3 and category B2:

(i) five years of practical aircraft maintenance experience on operating aircraft; or

(ii) three years of practical maintenance experience on operating aircraft and having acquired a Degree in Aircraft Maintenance or Degree in Engineering from a recognised University; or

(iii) two year of practical maintenance experience on operating aircraft and having successfully completed basic aircraft maintenance training conducted by a training organisation approved under rule 133B.

3. for category B2L:

(i) three years of practical maintenance experience in operating aircraft, covering the corresponding system rating, if the applicant has no previous relevant technical training; or

(ii) two years of practical maintenance experience on operating aircraft, covering the corresponding system rating, and having acquired a Degree in Aircraft Maintenance or Degree in Engineering from a recognised University; or

(iii) one year of practical maintenance experience on operating aircraft, covering the corresponding system rating, and having successfully completed basic aircraft maintenance training conducted by a training organisation approved under rule 133B.

Note: For the addition of new system rating(s) to an existing B2L licence, 3 months of

practical maintenance experience relevant to the new system rating(s) shall be required for each system rating added.

4. for category L:

(i) two years of practical experience in operating aircraft covering a representative cross section of maintenance activities in the corresponding sub-category; or

(ii) one years of practical maintenance experience on operating aircraft, covering the corresponding system rating, and having acquired a Degree in Aircraft Maintenance or Degree in Engineering from a recognized University or successfully completed basic aircraft maintenance training conducted by a training organisation approved under rule 133B.Note: For the inclusion of an additional subcategory in an existing L licence, the experience required by points (i) and (ii) shall be 12 and 6 months respectively.

5. for Category C with respect to complex motor-powered aircraft (CMPA):

(i) three years of maintenance experience in exercising privileges of categories B1.1, B1.3 or B2 as support staff, or both support staff and certifying staff, in a maintenance organisation approved under rule 133B working on CMPA, including 12 months of experience as base maintenance support staff; or

(ii) five years of maintenance experience in exercising privileges of categories B1.2, B1.4 or L5 as support staff, or both support staff and certifying staff, in a maintenance organisation approved under rule 133B working on CMPA, including 12 months of experience as base maintenance support staff;

6. for Category C with respect to aircraft other than complex motor powered aircraft (CMPA), three years of maintenance experience in exercising privileges of categories B1 or B2 or support staff, in a maintenance organisation approved under rule 133B, working on aircraft other than complex motor powered aircraft, including 6 months of experience as base maintenance support staff.

b) An applicant for the addition of a category or a sub-category to an existing licence shall have a minimum civil aircraft maintenance experience requirement appropriate to the additional category or sub-category of licence applied for as defined in Appendix IV to CAR 66.

c) The experience shall be practical and involve with a representative cross section of maintenance tasks on aircraft.

d) At least one year of the required experience shall be recent maintenance experience on aircraft of the category/subcategory for which the initial aircraft maintenance engineer's licence is sought. For subsequent category /subcategory additions to an existing aircraft maintenance engineer's licence, the additional recent maintenance experience required may be less than one year, but shall be at least three months. The required experience shall be dependent upon the difference between the licence category/subcategory held and applied for. Such additional experience shall be typical of the new licence category/subcategory sought.

Note: 'Recent maintenance experience' shall be acquired on the type of aircraft for which the aircraft maintenance engineer's license is sought.

e) Notwithstanding para (a), the twelve years of practical aircraft maintenance experience acquired outside a civil aircraft maintenance environment in the relevant category supplemented by at least one year of recent experience in civil aircraft maintenance environment, shall be treated as equivalent to the requirements laid down in sub paras (1) to (4) of para (a) above.

f) Experience shall have been acquired within the 10 years preceding the application for an aircraft maintenance licence or the addition of a category or subcategory to such a licence. Notwithstanding to this, the aircraft maintenance experience gained indefense environment in

the preceding fifteen years shall be acceptable.

AMC 66.A.30 (a) Basic Experience requirements

1. A skilled worker is a person who has successfully completed a training acceptable to DGCA and involving the manufacture, repair, overhaul or inspection of mechanical, electrical or electronic equipment. The training would include the use of tools and measuring devices.
2. Maintenance experience on operating aircraft:

   - Means the experience of being involved in maintenance tasks on aircraft which are being operated by airlines, air taxi organisations, aero clubs, owners, etc., as relevant to the licence category/subcategory & group/subgroup;
   - Should cover a wide range of tasks in terms of length, complexity and variety;
   - Aims at gaining sufficient experience in the real environment of maintenance asopposed to only the training school environment;
   - May be gained within different types of maintenance organisations (CAR-145, M.A. Subpart F etc.) or under the supervision of independent certifying staff;
   - May be combined with CAR-147 approved training (or other training approved by DGCA) training so that periods of training canbe intermixed with periods of experience, similar to an apprenticeship.

   Note: Maintenance experience gained on foreign registered aircraft maintained in a CAR 145 approved organization located in India shall be counted towards meeting the practical aircraft maintenance experience on operating aircraft.

   - in the case of the L licence, it is acceptable that the 1 or 2 years of experience required by 66.A.30(a)4 covers maintenance performed only during the weekends (or equivalent periods) as long as the applicant has achieved a sufficient level of competency related to the applicable licence subcategory as attested by the corresponding statement(s) issued by the maintenance organisation(s) or independent certifying staff that supervised the applicant.
3. In the case of an applicant for a licence including several categories/subcategories, it is acceptable to combine the periods of experience as long as there is a sufficient experience for each category/subcategory during the required period. Examples:

   - Application for a B1.1 (turbine aeroplanes) + B1.3 (turbine helicopters): The Regulation requires 5 years of experience for B1.1 and 5 years of experience for B1.3 for an applicant with no relevant previous technical training:
     - It is not acceptable to combine the experience in a single 5-year period where the applicant has been working for 3 years on turbine aeroplanes and 2 years on turbine helicopters.
     - However, it is acceptable to combine the experience in a single 5-year period if the applicant has been working for 5 years on turbine aeroplanes and turbine helicopters (for example, aeroplanes in the morning, helicopters in the afternoon, or a few days every week on aeroplanes and a few days every week on helicopters).
   - Application for a B1.1 (turbine aeroplanes) + B2 (avionics): The Regulation requires 5 years of experience for B1.1 and 5 years of experience for B2 for an applicant with no relevant previous technical training.
     - It is not acceptable to combine the experience in a single 5-year period where the applicant has been working for 3 years on turbine aeroplanes (with no avionics

work) and 2 years on avionics systems.

- However, it is acceptable to combine the experience in a single 5-year period if the applicant has been working for 5 years on structures, powerplant, mechanical and electrical systems and avionics (for B1.1 tasks in the morning, B2 tasks in the afternoon, or a few days every week for B1.1 tasks and a few days every week for B2 tasks).

- Application for a B1.1, B1.2, B1.3, B1.4 and B2: The Regulation requires 5 years of experience for B1.1, B1.3 and B2 and 3 years of experience for B1.2 and B1.4 for an applicant with no relevant previous technical training.

  - In this case, it is very unlikely that the experience for each category/subcategory would be sufficient.

Note 1:

- 'Experience in working in a civil aircraft maintenance environment on a representative selection of tasks directly associated with aircraft maintenance' means experience gained at an organisation that is approved in accordance with CAR-145, CAR-CAO, CAR-CAMO or similar, or experience in performing comparable work that is directly related to the continuing airworthiness of aircraft.
- 'Including 6 months of participation in the performance of base maintenance tasks' on operating aircraft means experience gained through the active participation in base maintenance checks at maintenance organisations.
- If the applicant has acquired experience on operating CMPA, the corresponding category C licence should be issued. If the experience acquired has been limited to other than CMPA, then only the corresponding category C licence with respect to other than CMPA should be issued.
- While it is strongly recommended that the participation in the performance of maintenance on aircraft should be at the level required for the issue of a B1 or B2 licence, the objective of the required experience is to gain insight into the performance of base maintenance.It is encouraged that the future category C licence holder participates in both simple and complex tasks during their experience in base maintenance and gains insight in some aircraft critical systems.
- In the case presented in point 66.A.30(e), for the required experience gained outside the civil environment, at least 1 year should be in a CAR-145 or CAR-CAO environment.

Note 2 : Category C licence will be issued for the aircraft type rating already endorsed on the licence.

GM1 66.A.30(a) Basic experience requirements

The table below summarises the basic experience requirements for the category C licence.

To: **From:**	**Category C** **for CMPA**	**Category C** **for other than CMPA**
Holder of a licence with **B1.1, B1.3, B2**, B3*, B2L*, or L*	3 years of experience as support staff, or both support staff and certifying staff, in operating CMPA, including 12 months as support staff in base maintenance.	3 years of experience as certifying staff or support staff, in operating other than CMPA, including 6 months as support staff in base maintenance.
Holder of a licence with **B1.2, B1.4** or **L5****	5 years of experience as support staff, or both support staff and certifying staff, in operating CMPA, including 12 months as	

	support staff in base maintenance.	
Holder of a licence with category C for other than CMPA	2 years of experience as B1, B2 or L5 support staff, or both support staff and certifying staff, including 6 months as support staff in base maintenance. 6 months as support staff in basemaintenance.	
Holder of a licence with category C for CMPA		6 months as support staff in base maintenance
* Only applicable to category C for other than CMPA. ** Only applicable to category C for CMPA.		

AMC 66.A.30(c) Basic experience requirements

In the case of the category B2L licence, the sentence 'a representative cross section of maintenance tasks on aircraft' refers to the person that has carried out some maintenance tasks that are representative of the systems corresponding to the system ratings for which he/she applies (see 66.A.03). These tasks may include troubleshooting, modifications or repairs.

AMC 66.A.30 (d) Basic Experience requirements

To be considered as recent experience; at least 50% of the required 12 month experience should be gained within the 12 month period prior to the date of application for the CAR- 66 aircraft maintenance license. The remainder of the experience should have been gained within the **7** year period prior to application. It must be noted that the rest of the basic experience required by 66.A.30 must be obtained within the 10 years prior to the application as required by 66.A.30 (f).

AMC 66.A.30 (e) Basic Experience requirements

1. For category A and L, the additional experience should be a minimum of 6 months in civil aircraft maintenance environment. For category B1, B2, B2L or B3, the additional experience should be a minimum of 12 months in civil aircraft maintenance environment.
2. Aircraft maintenance experience gained outside a civil aircraft maintenance environment can include aircraft maintenance experience gained in armed forces, coast guards, police etc. or in aircraft manufacturing.

66. A. 35 Demonstration of Skill

An applicant for grant or extension of Aircraft Maintenance Engineer's licence shall demonstrate his aircraft maintenance skill in respect of each category or sub-categoryof license or specific type of aircraft or systems in accordance with CAR 66.A.45 for which the application has been made to the Director General

66. A.40 Continued validity of the aircraft maintenance engineer's licence

(a) The aircraft maintenance engineer's licence becomes invalid after five years or ten years (under revised Aircraft Rule 61) after its last issue or renewal, unless the holder submits his/her aircraft maintenance engineer's licence to DGCA, in order to verify the information contained in the licence is the same as that contained in DGCA records.

(b) The holder of an aircraft maintenance engineer's licence shall complete the CA Form 19-03 (Refer Appendix-V) (through eGCA) and submit it with the holder's copy of the licence to DGCA, unless the holder works in a maintenance organization approved in accordance with CAR 145 or that has a procedure in its exposition where by such organisation may submit the necessary documentation on behalf of the aircraft maintenance engineer's licence holder.

(c) Any certification privileges based upon an aircraft maintenance engineer's licence becomes invalid as soon as the aircraft maintenance engineer's licence is invalid.

(d) The aircraft maintenance engineer's licence is only valid when issued and/or changed by DGCA and when the holder has signed the document.

(e) An application to renew a licence that has expired will be accepted for up to four years after the date of expiry of the licence. The applicant is required to submit certified evidence of 6 months actual aircraft experience relevant to the category held within the 24 months prior to their application and that he has not exercised the privileges of his licence during this period.

In case, the privileges have been exercised, necessary enforcement action shall be initiated. Such licence shall be considered for renewal only after enforcement action is complete.

In case the applicant does not meet minimum 6 months experience criteria, he should be advised to apply for renewal after acquiring 6 month maintenance experience.

Licences expired for more than four years will not be renewed and applicants will need to meet all of the applicable requirements for the issue of a licence in accordance with this CAR.

Note: *For the purpose of renewal of a DGCA CAR-66 Aircraft Maintenance Engineer's Licence only, maintenance experience acquired on foreign-registered aircraft within a foreign maintenance organization approved by EASA/ FAA etc , may be considered.*

GM 66.A.40 Continued validity of the aircraft maintenance licence

Validity of the CAR-66 aircraft maintenance licence is not affected by recency of maintenance experience whereas the validity of the 66.A.20 privileges is affected by maintenance experience as specified in 66.A.20 (a).

66. A.45 Endorsement with aircraft ratings

(a) In order to be entitled to exercise certification privileges on a specific aircraft type, the holder of an aircraft maintenance engineer licence need to have his/her licence endorsed with the relevant aircraft ratings.

— For category B1, B2 or C the relevant aircraft ratings are the following:

(i) For group 1 aircraft, the appropriate aircraft type rating.

(ii) For group 2 aircraft, the appropriate aircraft type rating, manufacturer sub-grouprating or full subgroup rating.

(iii)For group 3 aircraft, the appropriate aircraft type rating or full group rating.

(iv) for Group 4 aircraft, for the category B2 licence, the full group rating.

- For category B2L, the relevant aircraft ratings are the following:

(i) for Group 2 aircraft, the appropriate manufacturer subgroup rating or full subgroup rating;

(ii) for Group 3 aircraft, the full group rating;

(iii) for Group 4 aircraft, the full group rating.

— For category B3, the relevant rating is 'piston-engine non-pressurised aeroplanesof 2000 kg MTOM and below.

– For category L, the relevant aircraft ratings are the following:

(i) for subcategory L1C, the rating 'composite sailplanes';

(ii) for subcategory L1, the rating 'sailplanes';

(iii) for subcategory L2C, the rating 'composite powered sailplanes and composite LA1 aeroplanes';

(iv) for subcategory L2, the rating 'powered sailplanes and LA1 aeroplanes';

(v) for subcategory L3H, the rating 'hot-air balloons';

(vi) for subcategory L3G, the rating 'gas balloons'

(vii) for subcategory L4H, the rating 'hot-air airships';

(viii) for subcategory L4G, the rating 'LA2 gas airships';

(ix) for subcategory L5, the appropriate airship type rating.

— For category A, no rating is required, subject to compliance with the requirements of paragraph 145.A.35 of CAR-145.

(b) The endorsement of aircraft type ratings requires the satisfactory completion of one of the following:

- the relevant category B1, B2 or C aircraft type training in accordance with Appendix III of CAR66.
- in the case of gas airship type ratings on a B2 or L5 licence, a type training directly approved by DGCA.

(c) For other than category C licences ,in addition to the requirement of point (b), the endorsement of the first aircraft type rating within a given category/sub-category requires satisfactory completion of the corresponding On the Job Training, as described in Appendix III to CAR-66 except in the case of gas airships, where it shall be directly approved by DGCA.

Note: For the endorsement of the first type rating for Group 1 aircraft in each category/subcategory, the completion of On-the-Job Training (OJT) is mandatory.

(d) By derogation from points (b) and (c), for group 2 and 3 aircraft, aircraft type ratings may also be granted after:

— satisfactory completion of the relevant category B1 and B2 or C aircraft type examination described in Appendix III to CAR 66 and

— in the case of B1 and B2 category, demonstration of practical experience on the aircraft type. In that case, the practical experience shall include a representative cross section of maintenance activities relevant to the licence category, and

— passing of skill test conducted by DGCA on completion of practical experience on the aircraft type.

(e) For group 2 aircraft:

(i) the endorsement of manufacturer sub-group ratings for category B1 and C licence holders requires complying with the aircraft type rating requirements of at least two aircraft types from the same manufacturer which combined are representativeof the applicable manufacturer sub-group;

(ii) the endorsement of full sub-group ratings for category B1 and C licence holders requires complying with the aircraft type rating requirements of at least three aircraft types from different

manufacturers which combined are representative ofthe applicable sub-group;

(iii) the endorsement of manufacturer sub-groups and full sub-group ratings for category B2 and B2L licence holders requires demonstration of practical experience whichshall include a representative cross section of maintenance activities relevant to the licence category and to the applicable aircraft sub-group and, in the case of the B2L licence , relevant to the applicable system rating(s);

Note: By derogation from point (e)(iii), the holder of a B2 or B2L licence, endorsed with a full subgroup 2b, is entitled to be endorsed with a full subgroup 2c.

(f) For group 3 aircraft:

(i) the endorsement of the full group 3 rating for category B1 and C licence holdersrequires demonstration of practical experience, which shall include a representative cross section of maintenance activities relevant to the licence category/sub-category and to the group 3 and complying with the aircraft type rating endorsement of at least three aircraft types from different manufacturers which combined are representative of the applicable group.

(ii) for category B1, unless the applicant provides evidence of appropriate endorsement the group 3 rating shall be subject to the following limitations, which shall be endorsed on the licence:

— pressurised aeroplanes

— metal structure aeroplanes

— composite structure aeroplanes

— wooden structure aeroplanes

— aeroplanes with metal tubing structure covered with fabric.

(iii) the endorsement of the full group 3 rating for category B2 and B2L licence holders requires demonstration of practical experience, which shall include a representative cross section of maintenance activities relevant to the licence category and to the group 3.

For Group 4 aircraft:

The endorsement of the full group 4 rating for category B2 and B2L licence holdersrequire demonstration of practical experience, which shall include a representative cross sectionof maintenance activities relevant to the licence category and to Group 4.

Note: By derogation from point (f)(i), the holder of a B2L licence, endorsed with a full subgroup 2a or 2b, is entitled to be endorsed with Groups 3 and 4.

(g) For the B3 licence:

(i)the endorsement of the rating ‘piston-engine non-pressurised aeroplanes of2000 kg MTOM and below’ requires demonstration of practical experience which shall include a representative cross-section of maintenance activities relevant to the licence category and having passed type examination/ type training on at least one piston-engine non-pressurised aeroplane of 2000 kg MTOM and below.

(ii) passing of skill test conducted by DGCA on completion of practical experience on the aircraft type

(iii) Unless the applicant provides evidence of appropriate experience and having passed type

examination/ type training and skill test on at least one piston-engine non-pressurised aeroplane of 2000 kg MTOM and below covering the relevant structure, the rating referred to in point (i) shall be subject to the following limitations, which shall be endorsed on the licence:

— wooden structure aeroplanes

— aeroplanes with metal tubing structure covered with fabric

— metal structure aeroplanes

— composite structure aeroplanes.

(h) For all L licence subcategories, other than L5:

(i) the endorsement of ratings requires demonstration of practical experience which shall include a representative cross section of maintenance activities relevant to the licence subcategory;

(ii) unless the applicant provides evidence of appropriate experience, the ratings shall be subject to the following limitations, which shall be endorsed on the licence:

(1) for ratings 'sailplanes' and 'powered sailplanes and LA1 aeroplanes':

– wooden-structure aircraft covered with fabric,

– aircraft with metal-tubing structure covered with fabric,

– metal-structure aircraft,

– composite-structure aircraft,

(2) for the rating 'gas balloons':

– other than LA1 gas balloons; and

(3) If the applicant has only provided evidence of one-year experience in accordance with the derogation contained in point 66.A.30(a)(2)(iii), the following limitation shall be endorsed on the licence:

"complex maintenance tasks provided for in Appendix VII to CAR-M".

The holder of an aircraft maintenance licence in subcategory B1.2 endorsed with the Group 3 rating, or in category B3 endorsed with the rating 'piston engine non-pressurised aeroplanes of 2 000 kg MTOM and below', is deemed to meet the requirements for the issuance of a licence in subcategories L1 and L2 with the corresponding full ratings and with the same limitations as the B1.2/B3 licence held.

GM 66.A.45 (b) Endorsement with aircraft ratings

An aircraft type rating includes all the aircraft models/variants listed in column 2 of Appendix I to AMC to CAR-66.

When a person already holds a type rating on the licence and such type rating is amended in the Appendix I to AMC to CAR-66 in order to include additional models/variants, there is no need for additional type training for the purpose of amending the type rating in the licence. The rating should be amended to include the new variants, upon request by the applicant, without additional requirements. However, it is the responsibility of the licence holder and, if applicable, the maintenance organisation where he/she is employed to comply with 66.A.20(b)3, 145.A.35(a) and M.A.607(a), as applicable, before he/she exercises certification privileges.

Similarly, type training courses covering certain, but not all the models/variants included in a type

rating, are valid for the purpose of endorsing the full type rating.

GM 66.A.45 Endorsement with aircraft ratings

The following table shows a summary of the aircraft rating requirements contained in66.A.45, 66.A.50 and Appendix III to CAR-66.

The table contains the following:

- The different aircraft groups;
- For each licence (sub)category, which ratings are possible (at the choice of the applicant)
  - o Individual type ratings;
  - o Full and/or Manufacturer (sub)group ratings;
- For each rating option, which are the qualification options;
- For the B1.2 licence (Group 3 aircraft) and for the B3 licence (piston-engine non pressurized aeroplanes of 2000 kg MTOM and below) and the L licences, which are the possible limitations and ratings to be included in the licence if not sufficient experience can be demonstrated in those areas.

Aircraft rating requirements			
Aircraft	**B1/B3/L licence**	**B2/B2L licence**	**C licence**
Group 1 aircraft, except airships - Complex motor powered aircraft. - Multiple-engine helicopters. - Other than piston engine aeroplanes Certified above FL290. - Aircraft equipped with fly-by-wire. - Other aircraft when defined by DGCA	**(For B1)** **Individual TYPE RATING** Type training: - Theory + examination - Practical + assessment **PLUS** OJT (**)	**(For B2)** **Individual TYPE RATING** Type training: - Theory + examination - Practical + assessment **PLUS** OJT (**)	**Individual TYPE RATING** Type training: - Theory + examination
Group 1 airships	**(For L5 Licence)** **Individual TYPE RATING** Type training: - Theory + examination - Practical + assessment **PLUS** OJT (**)	**(For B2)** **Individual TYPE RATING** Type training: - Theory + examination - Practical + assessment PLUS OJT (**)	Not Applicable
Group 2 aircraft Subgroups: 2a: single turboprop aeroplanes (*)	**(For B1.1, B1.3, B1.4)** **Individual TYPE RATING** (type training + OJT(**) Or (type examination + practical experience + skill test)	**(For B2)** **Individual TYPE RATING** (type training + OJT(**)) **or** (type examination + practical experience + skill test)	**Individual TYPE RATING** type training or type evaluation

Aircraft rating requirements			
Aircraft	**B1/B3/L licence**	**B2/B2L licence**	**C licence**
2b: single turbine engine helicopters (*) 2c: single piston engine helicopters (*) (*) Except those classified in Group 1	**Full SUBGROUP RATING** (type training +OJT(**))**or** (type examination + practical experience + skill test) on at least 3 aircraft representative of that subgroup **Manufacturer SUBGROUP RATING** (type training + OJT(**)) **Or** (type examination + practical experience + skill test) on at least 2 aircraft representative of that manufacturer subgroup	(For B2 and B2L) **Full SUBGROUP RATING** based on demonstration of practical experience **Manufacturer SUBGROUP RATING** based on demonstration of practical experience	**Full SUBGROUP RATING** type training or type evaluation on at least3 aircraft representative of that subgroup **Manufacturer SUBGROUP RATING** type training **or** type examination on at least 2 aircraft representative of that manufacturer subgroup
Group 3 aircraft Piston engine aeroplanes (except those classified in Group 1)	(For B1.2) **Individual TYPE RATING** **(**type training + OJT(**) Or (type examination + practical experience + skill test) **Full GROUP 3 RATING** based on demonstration of practical experience and complying with the aircraft type rating endorsement of atleast three aircraft types from different manufactures which combined are representative of the applicable group. **Limitations:** - Pressurized aeroplanes - Metal aeroplanes - Composite aeroplanes - Wooden aeroplanes - Metal tubing & Fabric A eroplanes	(For B2) **Individual TYPE RATING** (type training + OJT(**)) or (type examination + practical experience + skill test) (For B2 and B2L) **Full GROUP 3 RATING** based on demonstration of appropriate experience	**Individual TYPE RATING** type training or type evaluation **Full GROUP 3 RATING** based on demonstration of practical experience and complying with the aircraft type rating endorsement of atleast three aircraft types from different manufactures which combined are Representative of the applicable group.
Piston-engine nonpressurised aeroplanes of 2 000 kg MTOM and below	(For B3) **FULL RATING "Piston engine non-pressurised aeroplanes of 2 000 kg**	This rating cannot be endorsed on a B2/B2L licence. These aircraft are already covered by	This rating cannot be endorsed on a C licence. These aircraft are already

Aircraft rating requirements			
Aircraft	**B1/B3/L licence**	**B2/B2L licence**	**C licence**
	MTOM and below" based on demonstration of practical experience and having passed type examination / type training and skill test on at least one piston-engine on pressurised aeroplanes of 2 000 kg MTOM and below. **Limitations:** - Metal aeroplanes - Composite aeroplanes - Wooden aeroplanes - Metal tubing & fabric aeroplanes	the endorsement of ratings for Group 3 aircraft (see box above)	covered by the endorsement of ratings for Group 3 aircraft (see box above)
Group 4 aircraft: Sailplanes, powered sailplanes, balloons and airships other than those in Group 1	(For all L subcategories, except L5) - For L1C: 'composite sailplanes' rating, - For L1: 'sailplanes' rating, - For L2C: 'composite powered sailplanes and composite LA1 aeroplanes' rating, - For L2: 'powered sailplanes and LA1 aeroplanes' rating, - For L3H: 'hot-air balloons' rating, - For L3G: 'gas balloons' rating, - For L4H: 'hot-air airships' rating, - For L4G: 'LA2 gas airships' rating, all based on demonstration of practical experience + skill test **Limitations:** see 66.A.45(h)	(For B2 and B2L) **Full GROUP 4 RATING** based on demonstration of practical experience	Not applicable

(**) The endorsement of the first aircraft type rating within a given category/sub-category requires satisfactory completion of the corresponding On the Job Training, as described in Appendix III to CAR-66.

Note: : For the endorsement of the first type rating for Group 1 aircraft in each category/subcategory, the completion of On-the-Job Training (OJT) is mandatory

AMC 66.A.45 (d), (e) 3, (f) 1 and (g) 1 Endorsement with aircraft ratings

1. The "practical experience" should cover a representative cross section including at least :

For categories B1,B2,B2L and B3: 50 % of tasks contained in Appendix II to AMC relevant

to the licence category and to the applicable aircraft type ratings or aircraft (sub) group ratings being endorsed.

For category L:

– in the subcategories L1, L1C, L2 or L2C: 50 % as in the paragraph related to B1, B2, B2L or B3;
– in the subcategories L3H and L3G for 'Balloons' or L4H, L4G and L5 for 'Airships', 80 % of the tasks should be demonstrated, and should include the tasks identified with an asterisk (*) in the Appendix;

This experience should cover tasks from each paragraph of the Appendix II list. Other tasks than those in the Appendix II may be considered as a replacement when they are relevant. In the case of (sub)group ratings, this experience may be shown by covering one or several aircraft types of the applicable (sub)group and may include experience on aircraft classified in group 1, 2 and/or 3 as long as the experience is relevant. The practical experience should be obtained under the supervision of authorized certifying staff.

2. In the case of endorsement of individual type ratings for Group 2 and Group 3 aircraft, for the second aircraft type of each manufacturer (sub) group the practical experience should be reduced to 30 % of the tasks contained in Appendix II to AMC relevant to the licence category and to the applicable aircraft type. For subsequent aircraft types of each manufacturer (sub) group this should be reduced to 20 %.
3. Practical experience should be demonstrated by the submission of records or a logbook showing the Appendix II tasks performed by the applicant. Typical data to be recorded are similar to those described in AMC 66.A.20 (b) 2.

AMC 66.A.45 (e) Endorsement with aircraft ratings

1. For the granting of manufacturer subgroup ratings for Group 2 aircraft, for B1 and C licence holders, the sentence "at least two aircraft types from the same manufacturer which combined are representative of the applicable manufacturer subgroup" means that the selected aircraft types should cover all the technologies relevant to the manufacturer subgroup in the following areas:

   - Flight control systems (mechanical controls/hydro mechanically powered controls /electromechanically powered controls); and

   - Avionic systems (analogue systems/digital systems); and

   - Structure (manufactured of metal/composite/wood).

   In cases where there are very different aircraft types within the same manufacturer subgroup, it may be necessary to cover more than two aircraft types to ensure adequate representation.

   For this purpose it may be possible to use aircraft types from the same manufacturer classified in Group 1 as long as the selected aircraft belong to the same licence sub category for which the rating will be endorsed.

2. For the granting of full subgroup ratings for Group 2 aircraft, for B1 and C licence holders, the sentence "at least three aircraft types from different manufacturers which combined are representative of the applicable subgroup" means that the selected aircraft types should cover all the technologies relevant to the manufacturer subgroup in the following areas:

   - Flight control systems (mechanical controls/hydro mechanically powered controls/ electromechanically powered controls); and

   - Avionic systems (analogue systems/digital systems); and

- Structure (manufactured of metal/composite/wood).

In cases where there are very different aircraft types within the same subgroup, it may be necessary to cover more than three aircraft types to ensure adequate representation. For this purpose it may be possible to use aircraft types from different manufacturers classified in Group 1 as long as the selected aircraft belong to the same licence subcategory for which the rating will be endorsed.

3. For manufacturer subgroup ratings, the term "manufacturer" means the TC holder defined in the certification data sheet, which is reflected in the list of type ratings in Appendix I to AMC to CAR-66.

In the case of an aircraft rating where the type rating refers to a TC holder made of a Combination of two manufacturers which produce a similar aircraft (i.e. AGUSTA/ BELL HELICOPTER TEXTRON or any case of aircraft similarly built by another manufacturer), this combination should be considered as one manufacturer.

As a consequence:

- When a licence holder gets a manufacturer type or a manufacturer subgroup ratingmade of a combination of manufacturers, it covers the combination of such manufacturers.
- When a licence holder who intends to endorse a full subgroup rating selects threeaircraft from different manufacturers, this means from different combinations of manufacturers as applicable.

GM 66.A.45 (h) (ii) Endorsement with aircraft ratings

For subcategories L1 and L2, it is possible to endorse the corresponding ratings with limitations depending on the type of structures covered by the experience gained.

For subcategory L3G, it is possible to endorse the rating 'gas balloons' with a limitation to 'other than LA1 gas balloons' if the experience gained only covers LA1 gas balloons.

However, no limitations are possible for the subcategories L1C, L2C, L3H, L4H and L4G. The ratings on these licences can only be obtained after demonstration of the appropriate experience representativeof the full scope of the licence subcategory.

66. A.50 Limitations

(a) Limitations introduced on an aircraft maintenance licence are exclusions from the certification privileges and in the case of limitations referred to in point 66.A.45, they affect the aircraft in its entirety.

(b) For limitations referred to in point 66.A.45, limitations shall be removed upon:
1. demonstration of appropriate experience ; or
2. After a satisfactory practical assessment performed by DGCA.

c) For limitations referred to in point 66.A.70, limitations shall be removed upon satisfactory completion of examination on those modules/subjects defined in the applicable conversion report referred to in APM Chapter 17

AMC 66.A.50 (b) Limitations

1. The appropriate experience required to remove the limitations referred to in 66.A.45 (f), (g) and (h) should consist of the performance of a variety of tasks appropriate to the limitations under the supervision of authorized certifying staff. This should include the tasks required by a scheduled

annual inspection. Alternatively, this experience may also be gained, if agreed by DGCA, by theoretical and practical training provided by the manufacturer, as long as an assessment is further carried out and recorded by this manufacturer.

2. It is acceptable to have this experience in just one aircraft type, provided that this type is representative of the (sub) group in relation to the limitation being removed.

3. It is acceptable that this experience is gained in aircraft not covered by the Basic Regulation, provided that this experience is relevant and representative of the corresponding (sub) group. An example could be the experience required to remove a limitation such as 'aircraft with metal tubing structure covered with fabric', which may be gained in ultra light aircraft (Annex I aircraft).

4. The application for the limitation removal should be supported by a record of experience signed by the authorized certifying staff or by an assessment signed by themanufacturer after completion of the applicable theoretical and practical training.

66. A.55 Evidence of qualification

Personnel exercising certification privileges as well as support staff must produce their licence as evidence of qualification, if required by an authorized person of DGCA,within 24 hours.

66. A.70 Conversion provisions-

a) The holder of a valid Aircraft Maintenance Engineer's Licence on the date of coming into force of this CAR may continue to exercise the privileges of his licence and shall be issued, with or without limitation and without further examination, an Aircraft Maintenance Engineer's Licence in the appropriate category subject to such conditions specified in Airworthiness Procedures Manual Chapter 17.

b) A person undergoing a qualification process, prior to the GSR No. 1001(E) dated 22.12.2010 regarding the Rule 61 of the Aircraft Rules, 1937 shall continue to be qualified till date as specified by the Director General. The holder of a qualification gained following such qualification process may be issued an aircraft maintenance engineer's licence subject to the conditions specified in Airworthiness Procedures Manual Chapter 17.

c) Where necessary, the aircraft maintenance engineer's licence shall contain limitations in accordance with point 66. A.50 to reflect the differences between

i) The scope of the certifying staff qualification

(ii) The basic knowledge requirements and the basic examination standards laid down in Appendix I and II to this CAR 66.

d) Aircraft Maintenance Engineer's Licences issued prior to this CAR coming into force in category "A" to cover Gliders, Balloons and in category "B", "D" and "X" to cover Aircraft, Engine, propeller and items of equipment to carryout maintenance and issue 'Certificate of Release to Service' that could not be transferred to CAR-66 licence 'Type Rating' shall be transferred to the CAR-66 licence section XIV (a) without altering the privileges hitherto exercised by the holder.

GM 66.A.70 Conversion provisions

1. As described in point 66.A.70, the conversion provisions apply to the holder of an AME Licence prior to the date of entry into force of CAR-66.

2. The conversion applies to "certifying staff qualifications" such as, for example:

- Holding an AME licence (or completed the process to obtain such a licence ;

  This does not mean that in order to be entitled to a conversion process, the applicant has to be exercising certification privileges. A person may hold a "certifying staff qualification" while not having certification privileges (or while exercising very limited certification privileges below his/her qualification) for different reasons such as, for example, the following:

- The person is working as "support staff" in the base maintenance environment;
- The person has been authorised only for a very limited range of tasks (lower thanwhat he/she would be entitled if his/her qualification is considered) since the person is working in a line station where the scope of tasks is very limited;
- The person holds a licence with a wider scope than the scope of the organisation where he/she is employed;
- The person is working outside the aviation industry or is temporarily on leave due to different reasons (medical, personal, etc.).

  These persons are entitled to have the conversion performed in accordance with the fullscope of their qualification and the full privileges that they would be entitled to hold onthe basis of such qualification.

3. As described in point 66.A.70, certifying staff qualifications eligible for conversion are those valid "prior to the date of entry into force of CAR-66.
4. Although only those certifying staff qualifications gained as indicated above are eligible for conversion, this does not mean that the application for conversion has to be submitted prior to those dates. The applicant is entitled to have the conversion performed irrespective of when he/she applies for conversion.
5. A certifying staff qualification can be subject to more than one conversion process andcan also be converted to more than one licence (sub)category (with any applicable limitations). Thiscould be the case, for example, for a person who already had the certifying staff qualification converted in the past to a B1.2 licence with limitations linked to some missing elements of the CAR-66 Appendix I and II standard (following 66.A.70(c)). This person would be entitled to apply and have his/her certifying staff qualification converted to a B1.2 or a B3 or L licence on the basis of 66.A.70(d), which would mean that there is no need to compare with the CAR-66 Appendix I, II and VII standard, introducing only those limitations required to maintain the existing privileges.

GM 66.A.70(c) Conversion provisions

For example, a limitation could be where a person holds a pre-existing certifying staff qualification which covered, to the standard of CAR-66 Appendix I and II, all the modules/subjects corresponding to the B1 licence except for electrical power systems. This person would receive a CAR-66 aircraft maintenance licence in the B1 category with a limitation (exclusion) on electrical power systems.

For removal of limitations, refer to 66.A.50(c).

GM 66.A.70 (d) Conversion provisions

In the case of aircraft not involved in commercial air transport other than large aircraft ,an example of limitations could be where a person holds a pre CAR-66 qualification which covered privileges to release work performed on aircraft structures, power plant,mechanical and electrical systems

but excluded privileges on aircraft equipped with turbine engine, aircraft above 2 000 kg MTOM, pressurised aircraft and aircraft equipped with retractable landing gear. This person would receive a CAR-66 aircraft maintenance licence in the B1.2 or B3 (sub) category with the following limitations (exclusions):

- Aircraft involved in commercial air transport (this limitation always exists);
- Aircraft above 2 000 kg MTOM;
- Pressurized aircraft;
- Aircraft equipped with retractable landing gear.

Another example of limitations could be where a pilot-owner holds a pre CAR-66 qualification which covered privileges to release work performed on aircraft structures, power plant, mechanical and electrical systems but limited to his/her own aircraft and to a particular aircraft type (for example, a Cessna 172). This pilot-owner would receivea CAR-66 aircraft maintenance licence in the B1.2 or B3 (sub) category with the following limitations (exclusions):

- Aircraft involved in commercial air transport (this limitation always exists);
- Aircraft other than a Cessna 172;
- Aircraft not owned by the licence holder.

The essential aspect is that the limitations are established in order to maintain the privileges of the pre CAR-66 qualification, without comparing the previous qualificationwith the standard of CAR-66 Appendix I and II.

For removal of limitations, refer to 66.A.50(c)

SUBPART B

AIRCRAFT OTHER THAN AEROPLANES AND HELICOPTERS

66. A.100 General

Microlight, light sport aircraft, glider, balloon or an airship shall be certified by an aircraft maintenance engineer holding a licence in category L or Category A or Category B1 or Category B3 or an authorised person subject to meeting the requirements as specified in the relevant CAR.

SUBPART C COMPONENTS

66. A. 200 General

This subpart lays down the minimum requirements in respect of knowledge, training, experience, examination and procedure for issue of authorisation by CAR -145 / CAR M Subpart-F/ CAR-CAO approved organisations to certifying staff employed in their organisation for maintenance and certification of components as per manufacturer maintenance data.

66.A.205 Requirements

Candidate for grant of authorization to carry out maintenance and certification of components, shall meet the following requirements:

(a) He shall not be less than 21 years of age.

(b) Knowledge:- The applicant shall have passed 10+2 with Physics, Chemistry and Mathematics or equivalent and

(c) should hold CAR 66 licence in appropriate category

or

passed basic AME training course or Degree in Aircraft Maintenance or Diploma / Degree in Engineering in the appropriate branch and must have passed Modules 9 and 10 of CAR 66 knowledge examinations conducted by DGCA.

(d) Training: Depending on the complexity and the technology of the component, the CC/S shall be able to demonstrate he/she received an appropriate training (theoretical and practical).

The applicant must have undergone a component training program conducted by Manufacturer of the component;

OR

Manufacturer recognized training organization;

OR

An appropriately rated maintenance organization provided: -

i) The person nominated to carry out the training can demonstrate he/she has received training to an appropriate level for the subject component.

ii) The person nominated to carry out the training is appropriately authorized by the maintenance organisation and is able to demonstrate a significant experience as in para (e) below on the relevant component maintenance.

iii) The training syllabus has been reviewed by the Workshop Manager and/or the Compliance Monitoring Manager.

iv) The component is available for practical training purpose.

Where there is a need to use a Bench Test (e.g. engine or ATEC bench test) or any specific equipment, the applicant must have undergone an appropriate training for the same. This training for the use of specific tools required by the Manufacturer's maintenance data shall have been received from the Manufacturer of the component or test equipment or an appropriately rated maintenance organization.

Note: For complex components such as engine/APU and Landing gears, the applicant either holds a CAR 66 Licence in appropriate category or must have undergone a component training program conducted by either the manufacturer of the component or manufacturer recognized training organization

Additional Training: The CC/S shall be able to demonstrate he/she received, as appropriate, training on:

i) Initial SMS & HF Training.

ii) MOE and internal procedures (including issuance of CA form 1).

In addition, where needed, the CC/S shall demonstrate he/she received appropriate training on:

iii) Fuel Tank Safety items, CDCCL level 1, or level 2 (refer to Appendix VIII to AMC to 145.A.30(e)

iv) Electrical Wiring Interconnection System

v) Any additional training(s) justified during the assessment performed by the maintenance organisation (e.g. human factor, aviation legislation, etc.)

Note 1: "Appropriate training" means that the training level/detail is proportional to the maintenance level granted to the concerned certifying staff as identified in his/her certification authorization.

Note 2: Having completed a Module 9 HF training does not supersede the need to comply with the initial Safety training including human factors in accordance with 145.A.30 (e). However, credit may be taken from the module 9 Human Factor training for the topics which are common in both trainings, provided the Module 9 HF training has been completed within the previous two years.

(e) Experience: Applicants meeting the knowledge requirements shall have the following experience:

i) For persons holding CAR 66 Aircraft Engineers' License: 12 months of practical experience in the specific component maintenance area / workshop including three months recent experience.

ii) For persons holding basic AME training course or Degree in Aircraft Maintenance or Diploma/ Degree in Engineering: two years of experience in the field of aviation maintenance including at least 12 months of practical experience in the specific component maintenance area / workshop including six months recent experience. For complex components such as engine/APU and Landing gears, three years of experience is required in the field of aviation maintenance including 24 Months of practical experience in the specific component maintenance area / workshop including six months recent experience.

iii) Candidate for certification of structural repair/ modification should have minimum two years relevant field experience, and produce evidence that he has performed

similar structural repairs at least twice under the supervision of an approved person in the preceding six months.

(f) Medical Fitness

The applicant should have been assessed medically fit by a registered medical practitioner to perform the scope of work applied for.

(g) Competency check :-

Before grant of authorization the competency of the candidate shall be assessed by the organization, following procedures documented in the organization exposition.

(h) Organizations desirous of using the provisions of this CAR shall detail their training programme, activities requiring certification authorisation, education, experience, on job training requirements and assessment procedure in their Maintenance Organization Exposition.

AMC 66.A.205 (g) Requirements.

For the grant of certification authorization the competency of the candidate shall be assessed by the organization, following procedures documented in the organization exposition. Guidelines for competency check is detailed in AMC and GM of CAR 145- 30(e).

66.A.210 Extension to Scope of Authorization

Candidate seeking extension to their scope of authorization of a particular stream(Mechanical or Avionics), in addition to meeting the training requirements of para 66.A.205 (d) of this CAR, shall have additional six months experience on the type of components for which certification authorisation is required. When the authorization is required to be granted for additional stream, the applicant shall have 24 months maintenance experience out of which 6 months must be recent experience.

Before grant of extension of authorization, the competency of the candidate shall be assessed by the organization, following procedures as mentioned in 66.A.205 (g).

66.A.215 Privileges

The privileges of component certifying staff shall cover:-

a) Issuance of Certificate of Release (CRS) after maintenance of components as per manufacturer maintenance data at shops and systems of aircraft/ engine (when at shop level and not fitted on the aircraft)

Note: Persons already holding approvals with CRS privileges may continue to be permitted to issue CRS on being permitted under the CAR 145 / CAR-CAO approval even if they are not meeting the requirement of this CAR. Such persons may also be considered for grant of additional certification authorization subject to meeting the requirements.

66.A.220 Validity of Certification Authorization

a) The Certification Authorization shall be valid for a period of one year and may be renewed by the Compliance Monitoring Manager/ Quality Manager subject to the condition that the person

i) Has exercised the privileges of the authorization for a minimum period of three months in the preceding 12 months;
ii) Has undergone refresher course in the preceding 24 months;
iii) Has been assessed medically fit; and
iv) Continues to remain in the employment or employment contract of the organization.

66.A.225 Suspensions, Cancellation and Return of Certification Authorization

(a) A Certification Authorization may be withdrawn where an enquiry conducted by the approved organization or DGCA establishes that:-

i) the holder of such an authorization has performed work or granted a certificate in respect of work which has not been performed in a careful and competent manner, or

ii) the holder of such an authorization has signed a certificate in respect of any matter which he is not authorized to deal with, or

iii) it is undesirable for any other reason that the holder of such authorization should continue to exercise the functions of an approval holder.

iv) Authorization of a person withdrawn as a result of an enquiry shall not be restored without approval of DGCA (Regional Airworthiness Office). Such person shall also not be granted other Authorization without the concurrence of DGCA (Regional Airworthiness Office).

v) All disciplinary actions taken against approved persons shall be immediately intimated to DGCA (Regional Airworthiness Office). Copies of warnings/ memoranda issued to the approved persons shall also be forwarded to DGCA (Regional Airworthiness Office).

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Director General of Civil Aviation

APPENDICES TO CAR-66

Appendix I - Basic Knowledge Requirements (except for Category L Licence)

i) KNOWLEDGE LEVELS - CATEGORY A, B1, B2, B3,B2L AND C AIRCRAFT MAINTENANCEENGINEER's LICENCE

Basic knowledge for categories A, B1, B2,B2L and B3 are indicated by the knowledge levels(1, 2 or 3) against each applicable subject. Category C applicant shall meet either category B1 or B2 basic knowledge level.

The knowledge level indicators are defined on defined on 3 levels as follows:

LEVEL 1

Familiarization with the principal elements of the subject.

Objectives:

(a) The applicant should be familiar with the basic elements of the subject.

(b) The applicant should be able to give a simple description of the whole subject,using common words and examples.

(c) The applicant should be able to use typical terms.

LEVEL 2

A general knowledge of the theoretical and practical aspects of the subject andan ability to apply that knowledge.

Objectives:

(a) The applicant should be able to understand theoretical fundamentals of thesubject.

(b) The applicant should be able to give a general description of the subject using as appropriate, typical examples.

(c) The applicant should be able to use mathematical formulae in conjunction with physical laws describing the subject.

(d) The applicant should be able to read and understand sketches, drawings andschematics describing the subject.

(e) The applicant should be able to apply his knowledge in a practical manner using detailed procedures.

LEVEL 3

A detailed knowledge of the theoretical and practical aspects of the subject and a capacity to combine and apply the separate elements of knowledge in a logical andcomprehensive manner.

Objectives:

(a) The applicant should know the theory of the subject and interrelation shipwith other subjects.

(b) The applicant should be able to give a detailed description of the subject usingtheoretical fundamentals and specific examples.

(c) The applicant should understand and be able to use mathematical formulaerelated to the subject.

(d) The applicant should be able to read, understand and prepare sketches, simple drawings

and schematics describing the subject.

(e) The applicant should be able to apply his knowledge in a practical mannerusing manufacturer's instructions.

(f) The applicant should be able to interpret results from various sources andmeasurements and apply corrective action where appropriate.

ii) MODULARISATION

Qualification on basic subjects for each CAR 66 aircraft maintenance licence category or subcategory shall be in accordance with the following matrix, where applicable subjects are indicated by an 'X', while 'n/a' means that the subject module is neither applicable nor required.

Subject module	B1.1 A1 Turbine engine	B1.2 A2 Piston engine	B1.3 A3 Turbine engine	B1.4 A4 Piston engine	B3 Piston engine non-pressurised aeroplanes MTOM ≤ 2000kg	B2	B2L
1. MATHEMATICS	N/A						
2. PHYSICS	N/A						
3. ELECTRICAL FUNDAMEN TALS	X	X	X	X	X	X	X
4. ELECTRONICS FUNDAMEN TALS	X(n/a for A1)	X(n/a for A2)	X(n/a for A3)	X(n/a for A4)	X	X	X
5. DIGITAL TECHNIQUES/ ELECTRONIC INSTRUMENT SYS TEMS	X	X	X	X	X	X	X
6. MATERIALS AND HARDWARE	X	X	X	X	X	X	X
7. MAINTENANCE PRACTICES	X	X	X	X	X	X	X
8. BASIC AERODYNAMICS	X	X	X	X	X	X	X
9. HUMAN FACTORS	X	X	X	X	X	X	X
10. AVIATION LEGISLATION	X	X	X	X	X	X	X
11. AEROPLANE AERODY NAMICS, STRUCTURES	X	X	n/a	n/a	X	n/a	n/a

Subject module	B1.1 A1 Turbine engine	B1.2 A2 Piston engine	B1.3 A3 Turbine engine	B1.4 A4 Piston engine	B3 Piston engine non-pressurised aeroplanes MTOM ≤ 2000kg	B2	B2L
AND SYSTEMS							
12. HELICOPTER AERODY NAMICS, STRUCTURES AND SYSTEMS	n/a	n/a	X	X	n/a	n/a	n/a
13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	n/a	n/a	n/a	n/a	n/a	X	X
14. PROPULSION	n/a	n/a	n/a	n/a	n/a	X	X
15. GAS TURBINE ENGINES	X	n/a	X	n/a	n/a	n/a	n/a
16. PISTON ENGINE	n/a	X	n/a	X	X	n/a	n/a
17. PROPELLER	X	X	n/a	n/a	X	n/a	n/a

MODULES (Appendix I to CAR-66)	LEVEL			
	A	B1	B2 B2L	B3
MODULE 1- Reserved	-	-	-	
MODULE 2- Reserved	-	-	-	

MODULE 3. ELECTRICAL FUNDAMENTALS

MODULE 3. ELECTRICAL FUNDAMENTALS		LEVEL		
		A	B1 B2 B2L	B3
3.1	*Electron theory*	1	1	1
3.2	*Static electricity and conduction*	1	2	1
3.3	*Electrical terminology*	1	2	1
3.4	*Generation of electricity*	1	1	1
3.5	*Sources of DC electricity*	1	2	2
3.6	*DC circuits*	1	2	1
3.7	*Resistance/resistor*			
	(a) Resistance;	—	2	1
	(b) Resistors.	—	1	—
3.8	*Power*	—	2	1
3.9	*Capacitance/capacitor*	—	2	1
3.10	*Magnetism*			
	(a) Theory of magnetism;	—	2	1
	(b) Magnetomotive force.	—	2	1
3.11	*Inductance/inductor*	—	2	1
3.12	*DC motor/generator theory*	—	2	1
3.13	*AC theory*	1	2	1
3.14	*Resistive (R), capacitive (C) and inductive (L) circuits*	—	2	1
3.15	*Transformers*	—	2	1
3.16	*Filters*	—	1	—
3.17	*AC generators*	—	2	1
3.18	*AC motors*	—	2	1

MODULE 4. ELECTRONIC FUNDAMENTALS

MODULE 4. ELECTRONICS FUNDAMENTALS	LEVEL		
	A	B1 B3	B2 B2L
4.1 *Semiconductors*			
4.1.1 *Diodes*			
(a) Description and characteristics;	—	2	2
(b) Operation and function.	—	—	2
4.1.2 *Transistors*			
(a) Description and characteristics;	—	1	2
(b) Construction and operation.	—	—	2
4.1.3 *Integrated circuits*			
(a) Basic description and operation;	—	1	2
(b) Description and operation.	—	—	2
4.2 *Printed circuit boards*	—	1	2
4.3 *Servomechanisms*			
(a) Principles;	—	1	2
(b) Construction, operation, and use.	—	—	2

MODULE 5. DIGITAL TECHNIQUES/ELECTRONIC INSTRUMENT SYSTEMS

MODULE 5. DIGITAL TECHNIQUES/ELECTRONIC INSTRUMENT SYSTEMS	LEVEL			
	A	B3	B1	B2 B2L
5.1 *Electronic instrument systems*	1	1	1	1
5.2 *Numbering systems*	—	—	1	2
5.3 *Data conversion*	—	—	1	2
5.4 *Data buses*	—	—	2	2
5.5 *Logic circuits*				
(a) Identification and applications;	—	—	2	2
(b) Interpretation of logic diagrams.	—	—	—	2
5.6 *Basic computer structure*				
(a) Computer terminology and technology;	1	1	2	2
(b) Computer operation.	—	—	—	2
5.7 *Microprocessors*	—	—	—	2
5.8 *Integrated circuits*	—	—	—	2
5.9 *Multiplexing*	—	—	—	2
5.10 *Fibre optics*	—	—	1	2

MODULE 5. DIGITAL TECHNIQUES/ELECTRONIC INSTRUMENT SYSTEMS	LEVEL			
	A	B3	B1	B2 B2L
5.11 *Electronic displays*	1	1	2	2
5.12 *Electrostatic sensitive devices*	1	1	2	2
5.13 *Software management control*	—	1	2	2
5.14 *Electromagnetic environment*	—	1	2	2
5.15 *Typical electronic/digital aircraft systems*	1	1	1	1

MODULE 6. MATERIALS AND HARDWARE

MODULE 6. MATERIALS AND HARDWARE	LEVEL		
	A	B1 B3	B2 B2L
6.1 *Aircraft materials – ferrous*			
(a) Alloy steels used in aircraft;	1	2	1
(b) Testing of ferrous materials;	—	1	1
(c) Repair and inspection procedures.	—	2	1
6.2 *Aircraft materials – non-ferrous*			
(a) Characteristics;	1	2	1
(b) Testing of non-ferrous materials;	—	1	1
(c) Repair and inspection procedures.	—	2	1
6.3 *Aircraft materials – composite and non-metallic*			
6.3.1 *Composite and non-metallic other than wood and fabric*			
(a) Characteristics;	1	2	2
(b) Detection of defects;	1	2	—
(c) Repairs and inspection procedures.	—	2	1
6.3.2 *Wooden structures*	1	1	—
6.3.3 *Fabric covering*	—	1	—
6.4 *Corrosion*			
(a) Chemical fundamentals;	1	1	1
(b) Types of corrosion.	2	3	2
6.5 *Fasteners*			
6.5.1 *Screw threads*	2	2	2
6.5.2 *Bolts, studs, and screws*	2	2	2
6.5.3 *Locking devices*	2	2	2
6.5.4 *Aircraft rivets*	1	2	1
6.6 *Pipes and unions*			
(a) Identification;	2	2	2
(b) Standard unions.	2	2	1

MODULE 6. MATERIALS AND HARDWARE		LEVEL		
		A	B1 B3	B2 B2L
6.7	*Springs*	—	2	1
6.8	*Bearings*	1	2	2
6.9	*Transmissions*	1	2	2
6.10	*Control cables*	1	2	1
6.11	*Electrical cables and connectors*	1	2	2

MODULE 7. MAINTENANCE PRACTICES

MODULE 7. MAINTENANCE PRACTICES		LEVEL		
		A	B1 B3	B2 B2L
7.1	*Safety precautions – aircraft and workshop*	3	3	3
7.2	*Workshop practices*	3	3	3
7.3	*Tools*	3	3	3
7.4	*(Reserved)*	—	—	—
7.5	*Engineering drawings, diagrams and standards*	1	2	2
7.6	*Fits and clearances*	1	2	1
7.7	*Electrical wiring interconnection system (EWIS)*	1	3	3
7.8	*Riveting*	1	2	—
7.9	*Pipes and hoses*	1	2	—
7.10	*Springs*	1	2	—
7.11	*Bearings*	1	2	—
7.12	*Transmissions*	1	2	—
7.13	*Control cables*	1	2	—
	7.14 *Material handling*			
	7.14.1 *Sheet metal*	—	2	—
	7.14.2 *Composite and non-metallic*	—	2	—
	7.14.3 *Additive manufacturing*	1	1	1
7.15	*(Reserved)*	—	—	—
7.16	*Aircraft weight and balance*			
	(a) Centre-of-gravity calculation;	—	2	2
	(b) Aircraft weighing.	—	2	—
7.17	*Aircraft handling and storage*	2	2	2
7.18	*Disassembly, inspection, repair and assembly techniques*			
	(a) Types of defects and visual inspection techniques;	2	3	3
	(b) General repair methods – structural repair manual;	—	2	—
	(c) Non-destructive inspection techniques;	—	2	1
	(d) Disassembly and reassembly techniques;	2	2	2

MODULE 7. MAINTENANCE PRACTICES		LEVEL		
		A	B1 B3	B2 B2L
	(e) Troubleshooting techniques.	—	2	2
7.19	*Abnormal events*			
	(a) Inspections following lightning strikes and HIRF penetration;	2	2	2
	(b) Inspections following abnormal events such as heavy landings and flight through turbulence.	2	2	—
7.20	*Maintenance procedures*	1	2	2
7.21	*Documentation S communication*	1	2	2

MODULE 8. BASIC AERODYNAMICS

MODULE 8. BASIC AERODYNAMICS		LEVEL	
		A B3	B1 B2 B2L
8.1	*Physics of the atmosphere* International Standard Atmosphere (ISA), application to aerodynamics	1	2
8.2	*Aerodynamics*	1	2
8.3	*Theory of flight*	1	2
8.4	*High-speed airflow*	1	2
8.5	*Flight stability and dynamics*	1	2

MODULE 9. HUMAN FACTORS

MODULE 9. HUMAN FACTORS		LEVEL
		ALL
9.1	*General*	2
9.2	*Human performance and limitations*	2
9.3	*Social psychology*	1
9.4	*Factors that affect performance*	2
9.5	*Physical environment*	1
9.6	*Tasks*	1
9.7	*Communication*	2
9.8	*Human error*	2
9.9	*Safety management*	2
9.10	*The 'Dirty Dozen' and risk mitigation*	2

MODULE 10. AVIATION LEGISLATION

MODULE 10. AVIATION LEGISLATION		LEVEL	
		A	B1 B2 B2L B3
10.1	*Regulatory framework*	1	1
10.2	*Certifying staff – maintenance*	2	2
10.3	*Approved maintenance organisations*	2	2
10.4	*Independent certifying staff*	—	3
10.5	*Air operations*	1	1
10.6	*Certification of aircraft, parts, and appliances*	2	2
10.7	*Continuing airworthiness*	2	2
10.8	*Oversight principles in continuing airworthiness*	1	1
10.9	*Maintenance and certification with respect to aircraft other than aeroplanes and helicopters-*	-	1
10.10	*Cybersecurity in aviation maintenance*	1	1

MODULE 11. AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 11. AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS		LEVEL				
		A1	A2	B1.1	B1.2	B3
11.1	*Theory of flight*					
	(a) Aeroplane aerodynamics and flight controls;	1	1	2	2	1
	(b) Aeroplane, other aerodynamic devices.	1	1	2	2	1
11.2	*Airframe structures* ***(ATA 51)***					
	(a) General concepts;	2	2	2	2	2
	(b) Airworthiness requirements for structural strength;	2	2	2	2	2
	(c) Construction methods.	1	1	2	2	2
11.3	*Airframe structures – aeroplanes*					
	11.3.1 *Fuselage, doors, windows (**ATA 52/53/56**)*	1	1	2	2	1
	(a) Construction principles;					
	(b) Airborne towing devices;	1	1	1	1	1
	(c) Doors.	1	1	2	1	-
	11.3.2 *Wings (**ATA 57**)*	1	1	2	2	1
	11.3.3 *Stabilisers (**ATA 55**)*	1	1	2	2	1
	11.3.4 *Flight control surfaces (**ATA 55/57**)*	1	1	2	2	1
	11.3.5 *Nacelles/pylons (**ATA 54**)*	1	1	2	2	1
11.4	*Air conditioning and cabin pressurisation (**ATA 21**)*					
	(a) Pressurisation;	1	1	3	3	—

MODULE 11. AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL				
	A1	A2	B1.1	B1.2	B3
(b) Air supply;	1	—	3	—	—
(c) Air conditioning;	1	—	3	—	—
(d) Safety and warning devices;	1	1	3	3	—
(e) Heating and ventilation system.	—	1	—	3	1
11.5 *Instruments/avionics systems*					
11.5.1 *Instrument systems (**ATA 31**)*	1	1	2	2	2
11.5.2 *Avionics systems*	1	1	1	1	1
Fundamentals of system layouts and operation of: Autoflight (**ATA 22**); Communications (**ATA 23**); Navigation systems (**ATA 34**).					
11.6 *Electrical power (**ATA 24**)*	1	1	3	3	3
11.7 *Equipment and furnishings **(ATA 25)***					
(a) Emergency equipment;	2	2	2	2	2
(b) Cabin and cargo layout.	1	1	1	1	—
11.8 *Fire protection **(ATA 26)***					
(a) Fire and smoke detection system and fire-extinguishing systems;	1	1	1	1	—
(b) Portable fire extinguisher.	1	1	1	1	1
11.9 *Flight controls **(ATA 27)***	1	1	3	3	2
(a) Primary and secondary flight controls;					
(b) Actuation and protection;	1	—	3	—	—
(c) System operation;	1	—	3	—	—
(d) Balancing and rigging.	1	1	3	3	2
11.10 *Fuel systems **(ATA 28, ATA 47)***	1	1	3	3	1
(a) Systems layout;					
(b) Fuel handling;	1	1	3	3	1
(c) Indication and warnings;	1	1	3	3	1
(d) Special systems;	1	—	3	—	—
(e) Balancing.	1	—	3	—	—
11.11 *Hydraulic power **(ATA 29)***	1	1	3	3	2
(a) System description;					
(b) System operation (1);	1	1	3	3	2
(c) System operation (2).	1	—	3	—	—
11.12 *Ice and rain protection **(ATA 30)***					
(a) Principles;	1	1	3	3	1

MODULE 11. AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL				
	A1	A2	B1.1	B1.2	B3
(b) De-icing;	1	1	3	3	1
(c) Anti-icing;	1	—	3	—	—
(d) Wipers;	1	1	3	3	1
(e) Rain repellent systems	1	—	3	—	—
11.13 *Landing gear* ***(ATA 32)***					
(a) Description;	2	2	3	3	2
(b) System operation;	2	2	3	3	2
(c) Air-ground sensing;	2	—	3	—	—
(d) Tail protection.	2	2	3	3	2
11.14 *Lights* ***(ATA 33)***	2	2	3	3	2
11.15 *Oxygen* ***(ATA 35)***	1	1	3	3	2
11.16 *Pneumatic/vacuum* ***(ATA 36)***					
(a) Systems;	1	1	3	3	2
(b) Pumps.	1	1	3	3	2
11.17 *Water/waste* ***(ATA 38)***					
(a) Systems;	2	2	3	3	2
(b) Corrosion.	2	2	3	3	2
11.18 *On-board maintenance systems* ***(ATA 45)***	1	—	2	—	—
11.19 Integrated Modular Avionics (ATA 42)					
a) Overall system description and theory;	1	—	2	—	—
b) Typical system layouts.	1	—	2	—	—
11.20 Cabin systems (ATA 44)	1	—	2	—	—
11.21 Information systems (ATA 46)	1	—	2	—	—

MODULE 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL	
	A3 A4	B1.3 B1.4
12.1 *Theory of flight – rotary wing aerodynamics*	1	2
12.2 *Flight control systems* ***(ATA 67)***	2	3
12.3 *Blade tracking and vibration analysis* ***(ATA 18)***	1	3
12.4 *Transmission*	1	3
12.5 *Airframe structures* ***(ATA 51)***		
(a) General concept;	2	2

MODULE 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL	
	A3 A4	B1.3 B1.4
(b) Construction methods of the principal elements.	1	2
12.6 *Air conditioning* ***(ATA 21)***		
12.6.1 *Air supply*	1	2
12.6.2 *Air conditioning*	1	3
12.7 *Instruments/avionics systems*		
12.7.1 *Instrument systems* ***(ATA 31)***	1	2
12.7.2 *Avionics systems* Fundamentals of system layouts and operation of: Autoflight **(ATA 22)**; Communications **(ATA 23)**; Navigation systems **(ATA 34)**.	1	1
12.8 *Electrical Power* ***(ATA 24)***	1	3
12.9 *Equipment and Furnishings* ***(ATA 25)***		
(a) Emergency equipment; Seats, harnesses, and belts; Lifting systems;	2	2
(b) Emergency flotation systems; Cabin layout, cargo retention; Equipment layout; Cabin furnishing installation.	1	1
12.10 *Fire Protection* ***(ATA 26)*** (a) Fire and smoke detection systems and Fire-extinguishing systems;	1	3
(b) Portable fire extinguishers.	1	1
12.11 *Fuel Systems* ***(ATA 28)***	1	3
12.12 *Hydraulic Power* ***(ATA 29)***	1	3
12.13 *Ice and Rain Protection* ***(ATA 30)***	1	3
12.14 *Landing Gear* ***(ATA 32)*** (a) System description and operation;	2	3
(b) Sensors.	2	3
12.15 *Lights* ***(ATA 33)***	2	3
12.16 *(Reserved)*	2	3
12.17 *Integrated Modular Avionics* ***(ATA 42)***		
(a) Overall system description and theory	1	2
(b) Typical system layouts	1	2
12.18 *On-board Maintenance Systems* ***(ATA 45)*** Central maintenance computers; Data-loading system; Electronic library system.	1	2
12.19 *Information Systems* ***(ATA 46)***	1	2

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS

C/N: Communication & Navigation; Ins.: Instruments; A/F: Autoflight; Sur.: Surveillance; A/S: Airframe & Systems

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL						
	B2	B2L Basic	B2L C/N	B2L Ins.	B2L A/F	B2L Sur.	B2L A/S
13.1 *Theory of Flight*							
(a) Aeroplane Aerodynamics and Flight Controls;	1	1	—	—	—	—	—
(b) Rotary Wing Aerodynamics.	1	1	—	—	—	—	—
13.2 *Structures – General Concepts* ***(ATA 51)***							
(a) General concept;	2	2	—	—	—	—	—
(b) Fundamentals of structural systems;	1	1	—	—	—	—	—
13.3 *Autoflight* ***(ATA 22)***							
(a) Fundamentals of automatic flight control;	3	—	—	—	3	—	—
(b) Autothrottle systems and automatic landing systems.	3	—	—	—	3	—	—
13.4 *Communication/Navigation* ***(ATA 23/34)***	3	—	3	—	—	—	—
(a) Fundamentals of communication and navigation systems;							
(b) Fundamentals of aircraft surveillance systems.	3	—	—	—	—	3	—
13.5 *Electrical power* ***(ATA 24)***	3	3	—	—	—	—	—
13.6 *Equipment and furnishings* ***(ATA 25)***	3	—	—	—	—	—	—
13.7 *Flight controls*							
(a) Primary and secondary flight controls ***(ATA 27)***;	2	—	—	—	2	—	—
(b) Actuation and protection;	2	—	—	—	2	—	—
(c) System operation;	3	—	—	—	3	—	—
(d) Rotorcraft flight controls ***(ATA 67)***.	2	—	—	—	2	—	—
13.8 *Instruments* ***(ATA 31)***	3	—	—	3	—	—	—

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL						
	B2	B2L Basic	B2L C/N	B2L Ins.	B2L A/F	B2L Sur.	B2L A/S
13.9 *Lights* ***(ATA 33)***	3	3	—	—	—	—	—
13.10 *On-board maintenance systems* ***(ATA 45)***	3	—	—	—	—	—	—
13.11 *Air conditioning and cabin pressurisation* ***(ATA 21)***	3	—	—	—	—	—	3
(a) Pressurisation;	1	—	—	—	—	—	1
(b) Air supply;	3	—	—	—	—	—	3
(c) Air conditioning;	3	—	—	—	—	—	3
(d) Safety and warning devices.							
13.12 *Fire protection* ***(ATA 26)***							
(a) Fire and smoke detection system and fire-extinguishing systems;	3	—	—	—	—	—	3
(b) Portable fire extinguisher.	1	—	—	—	—	—	1
13.13 *Fuel systems* ***(ATA 28, ATA 47)***							
(a) System layout;	1	—	—	—	—	—	1
(b) Fuel handling;	2	—	—	—	—	—	2
(c) Indications and warnings;	3	—	—	—	—	—	3
(d) Special systems;	1	—	—	—	—	—	1
(e) Balancing.	3	—	—	—	—	—	3
13.14 *Hydraulic power* ***(ATA 29)***							
(a) System layout;	1	—	—	—	—	—	1
(b) System operation (1);	3	—	—	—	—	—	3
(c) System operation (2).	3	—	—	—	—	—	3
13.15 *Ice and rain protection* ***(ATA 30)***							
(a) Principles;	2	—	—	—	—	—	2
(b) De-icing;	3	—	—	—	—	—	3

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL						
	B2	B2L Basic	B2L C/N	B2L Ins.	B2L A/F	B2L Sur.	B2L A/S
(c) Anti-icing;	2	—	—	—	—	—	2
(d) Wiper systems;	1	—	—	—	—	—	1
(e) Rain repellent.	1	—	—	—	—	—	1
13.16 *Landing gear* ***(ATA 32)***							
(a) Description;	1	—	—	—	—	—	1
(b) System;	3	—	—	—	—	—	3
(c) Air–ground sensing.	3	—	—	—	—	—	3
13.17 *Oxygen* ***(ATA 35)***	3	—	—	—	—	—	3
13.18 *Pneumatic/vacuum* ***(ATA 36)***	2		—	—	—	—	2
13.19 *Water/waste* ***(ATA 38)***	2	—	—	—	—	—	2
13.20 *Integrated modular avionics* ***(ATA 42)*** (a) Overall system description and theory;	3	-	—	—	—	—	—
(b) Typical system layouts.	3	-	—	—	—	—	—
13.21 *Cabin systems* ***(ATA 44)***	3	—	—	—	—	—	—
13.22 *Information systems* ***(ATA 46)***	3	—	—	—	—	—	—

MODULE 14. PROPULSION

MODULE 14. PROPULSION	LEVEL B2 B2L Instruments B2L Airframe & Systems
14.1 *Engines*	
(a) Turbine engines;	1
(b) Auxiliary power units (APUs);	1
(c) Piston engines;	1

MODULE 14. PROPULSION	LEVEL B2 B2L Instruments B2L Airframe & Systems
(d) Electric and hybrid engines;	2
(e) Engine control.	2
14.2 *Electric/electronic engine indication systems*	2
14.3 *Propeller systems*	2
14.4 *Starting and ignition systems*	2

MODULE 15. GAS TURBINE ENGINE

MODULE 15. GAS TURBINE ENGINE	LEVEL	
	A1 A3	B1.1 B1.3
15.1 *Fundamentals*	1	2
15.2 *Engine performance*	—	2
15.3 *Inlet*	2	2
15.4 *Compressors*	1	2
15.5 *Combustion section*	1	2
15.6 *Turbine section*	2	2
15.7 *Exhaust*	1	2
15.8 *Bearings and seals*	—	2
15.9 *Lubricants and fuels*	1	2
15.10 *Lubrication systems*	1	2
15.11 *Fuel systems*	1	2
15.12 *Air systems*	1	2
15.13 *Starting and ignition systems*	1	2
15.14 *Engine indication systems*	1	2
15.15 *Alternate turbine constructions*	—	1
15.16 *Turboprop engines*	1	2
15.17 *Turboshaft engines*	1	2
15.18 *Auxiliary power units (APUs)*	1	2
15.19 *Power plant installation*	1	2
15.20 *Fire protection systems*	1	2
15.21 *Engine monitoring and ground operation*	1	3
15.22 *Engine storage and preservation*	—	2

MODULE 16. PISTON ENGINE

	LEVEL

MODULE 16. PISTON ENGINE	A2 A4	B1.2 B1.4 B3
16.1 *Fundamentals*	1	2
16.2 *Engine performance*	1	2
16.3 *Engine construction*	1	2
16.4 *Engine fuel systems* 16.4.1 *Carburettors*	1	2
16.4.2 *Fuel injection systems*	1	2
16.4.3 *Electronic engine control*	1	2
16.5 *Starting and ignition systems*	1	2
16.6 *Induction, exhaust and cooling systems*	1	2
16.7 *Supercharging/turbocharging*	1	2
16.8 *Lubricants and fuels*	1	2
16.9 *Lubrication systems*	1	2
16.10 *Engine indication systems*	1	2
16.11 *Power plant installation*	1	2
16.12 *Engine monitoring and ground operation*	1	3
16.13 *Engine storage and preservation*	—	2
16.14 *Alternative piston engine constructions*	1	1

MODULE 17. PROPELLER

MODULE 17. PROPELLER	LEVEL	
	A1 A2	B1.1 B1.2 B3
17.1 *Fundamentals*	1	2
17.2 *Propeller construction*	1	2
17.3 *Propeller pitch control*	1	2
17.4 *Propeller synchronising*	—	2
17.5 *Propeller ice protection*	1	2
17.6 *Propeller maintenance*	1	3
17.7 *Propeller storage and preservation*	1	2’

iii) Basic training methods

An appropriate training method, or combination of methods, shall be determined for the entire course or for each of its modules or submodules, with regard to the scope and objectives of each training phase and taking into consideration the benefits and limitations of the available training methods.

Multimedia-based training (MBT) methods may be used in order to achieve the training objectives

AMC1 Appendix I Basic Knowledge Requirements (except for category L licence) Section 2

MODULARISATION

MODULE 3— ELECTRICS FUNDAMENTALS	LEVEL		
	A1 A2 A3 A4	B1 B2 B2L	B3
3.1 *Electron theory* Structure and distribution of electrical charges within atoms, molecules, ions, and compounds; Molecular structure of conductors, semiconductors, and insulators.	1	1	1
3.2 *Static electricity and conduction* Static electricity and distribution of electrostatic charges; Electrostatic laws of attraction and repulsion; Units of charge, Coulomb's law; Conduction of electricity in solids, liquids, gases and in vacuum.	1	2	1
3.3 *Electrical terminology* The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.	1	2	1
3.4 Generation of electricity Production of electricity by the following methods: light, heat, friction, pressure, chemical reaction, magnetism, and motion.	1	1	1
3.5 *Sources of DC electricity* Construction and basic chemical reaction of primary cells, secondary cells, lead acid cells, nickel cadmium cells, lithium cells, nickel cells and other alkaline cells; Cells connected in series and in parallel; Internal resistance and its effect on a battery; Construction, materials, and operation of thermocouples; Operation of photocells.	1	2	2
3.6 *DC circuits* Ohm's law, Kirchhoff's voltage, and current laws; Calculations using the above laws to find resistance, voltage, and current; Significance of the internal resistance of a supply.	1	2	1
3.7 *Resistance/Resistor* (a) Resistance Specific resistance; Calculation of total resistance using series, parallel and series parallel combinations; Operation and use of potentiometers and rheostats; Operation of Wheatstone Bridge.	—	2	1

MODULE 3— ELECTRICS FUNDAMENTALS	LEVEL		
	A1 A2 A3 A4	B1 B2 B2L	B3
(b) Resistor Positive and negative temperature coefficient conductance; Resistor colour code, values and tolerances, preferred values, wattage ratings; Resistors in series and in parallel; Fixed resistors, stability, tolerance and limitations, methods of construction; Variable resistors, thermistors, voltage-dependent resistors; Construction of potentiometers and rheostats; Construction of Wheatstone Bridge.	—	1	—
3.8 *Power* Power, work, and energy (kinetic and potential); Dissipation of power by a resistor; Power formula; Calculations involving power, work, and energy.	—	2	1
3.9 *Capacitance/Capacitor* Operation and function of a capacitor; Factors that affect the capacitance area of plates, distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating; Capacitor types, construction, and function; Capacitor colour-coding; Calculations of capacitance and voltage in series and in parallel circuits; Exponential charge and discharge of a capacitor, time constants; Testing of capacitors.	—	2	1
3.10 *Magnetism* (a) Theory of magnetism; Properties of a magnet; Action of a magnet suspended in the Earth's magnetic field; Magnetisation and demagnetisation; Magnetic shielding; Various types of magnetic material; Electromagnet construction and principles of operation; Handclasp rules to determine magnetic field around current-carrying conductor.	—	2	1
(b) Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; Precautions for care and storage of magnets.		2	1
3.11 *Inductance/Inductor* Faraday's law; Action of inducing a voltage in a conductor that moves in a magnetic field; Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns; Mutual induction; The effect that the rates of change of primary current and mutual inductance have on induced voltage;	—	2	1

MODULE 3— ELECTRICS FUNDAMENTALS	LEVEL		
	A1 A2 A3 A4	B1 B2 B2L	B3
Factors that affect mutual inductance: number of turns in the coil, physical size of the coil, permeability of the coil, position of coils with respect to each other; Lenz's law and polarity determining rules; Back EMF, self-induction; Saturation point; Principal uses of inductors.			
3.12 *DC motor/generator theory* Basic motor and generator theory; Construction and purpose of components in a DC generator; Operation of and factors that affect the output and direction of the current in DC generators; Operation of and factors that affect the output power, torque, speed, and direction of rotation of DC motors; Series-wound, shunt-wound and compound motors; Starter generator construction.	–	2	1
3.13 *AC theory* Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak-to-peak current values and calculations of these values in relation to voltage, current and power; Triangular/Square waves; Single-phase/Three-phase principles.	1	2	1
3.14 *Resistive (R), capacitive (C) and inductive (L) circuits* Phase the relationship of voltage and current in L, C and R circuits, parallel, series and series parallel; Power dissipation in L, C and R circuits; Impedance, phase angle, power factor and current calculations; True power, apparent power, and reactive power calculations.	—	2	1
3.15 *Transformers* Transformer construction principles and operation; Transformer losses and methods for overcoming them; Transformer action under load and no-load conditions; Power transfer, efficiency, polarity markings; Line and phase voltages and currents; Power in a three-phase system; Primary and secondary current, voltage, turn ratio, power, efficiency; Auto-transformers.	—	2	1
3.16 *Filters* Operation, application, and uses of the following filters: low pass, high pass, band pass, band stop.	—	1	—

MODULE 3— ELECTRICS FUNDAMENTALS	LEVEL		
	A1 A2 A3 A4	B1 B2 B2L	B3
3.17 *AC generators* Rotation of loop in a magnetic field and waveform produced; Operation and construction of revolving armature and revolving field type AC generators; Single-phase, two-phase, and three-phase alternators; Three-phase star and delta connection advantages, and uses; Permanent magnet generators.	—	2	1
3.18 *AC motors* Construction, principles of operation and characteristics of: AC synchronous and induction motors both single-phase and polyphase; Methods of speed control and direction of rotation; Methods of producing a rotating field: capacitor, shaded or split pole.	—	2	1

MODULE 4 ELECTRONICS FUNDAMENTALS

MODULE 4— ELECTRONICS FUNDAMENTALS	LEVEL		
	A1 A2 A3 A4	B1 B3	B2 B2L
4.1 *Semiconductors* 4.1.1 *Diodes* (a) Description and characteristics Diode symbols; Diode characteristics and properties; Diodes in series and in parallel; Materials, electron configuration, electrical properties; P and N type materials: effects of impurities on conduction, majority and minority characters; P–N junction in a semiconductor, development of a potential across a P–N junction in unbiased, forward-biased and reverse-biased conditions; Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation; Main characteristics and use of silicon-controlled rectifiers (thyristors),	—	2	2

MODULE 4— ELECTRONICS FUNDAMENTALS	LEVEL		
	A1 A2 A3 A4	B1 B3	B2 B2L
light- emitting diodes (LEDs), photo-conductive diodes, rectifier diodes. (b) Operation and function Operation and function of diodes in the following circuits: clippers, clampers, full- and half-wave rectifiers, bridge rectifiers, voltage doublers and triplers; Detailed operation and characteristics of the following devices: silicon-controlled rectifier (thyristor), light-emitting diode (LED), Schottky diode, photo-conductive diode, varactor diode, varistor, rectifier diodes, Zener diode. Functional testing of diodes.	—	—	2
4.1.2 *Transistors* (a) Description and characteristics Transistor symbols; Component description and orientation; Transistor characteristics and properties.	—	1	2
(b) Construction and operation Construction and operation of PNP and NPN transistors; Base, collector and emitter configurations; Testing of transistors; Basic appreciation of other transistor types, including types of FET and their uses; Application of transistors: amplifier classes (A, B, C); Simple circuits including bias, decoupling, feedback and stabilisation; Multistage circuit principles: cascades, push- pull, oscillators, multivibrators, flip-flop circuits; Operation and amplifier stages connecting methods: resistive, capacitive, direct, inverting, non-inverting and adding	—	—	2
4.1.3 *Integrated circuits* (a) Description and operation of logic circuits and linear circuits/operational amplifiers;	—	1	2
(b) Introduction to the operation and function of an operational amplifier used as: an integrator, a differentiator, a voltage follower, a comparator; Advantages and disadvantages of positive and negative feedback.	—	—	2
4.2 *Printed circuit boards* Description and use of printed circuit boards.	—	1	2

MODULE 4— ELECTRONICS FUNDAMENTALS	LEVEL		
	A1 A2 A3 A4	B1 B3	B2 B2L
4.3 *Servomechanisms* (a) Principles Understanding of the following principles: open- and closed-loop systems, servomechanism, feedback, follow-up, null, overshoot, damping, deadband, hunting, proximity switches, analogue transducers, synchro systems and components, digital tachometers and encoders, inductance, and capacitance transmitters;	—	1	2
(b) Construction operation and use of the following synchro-system components: resolvers, differential, control and torque, E and I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters; Construction, operation and use of servomechanism and PID controller; Fault-finding of servo defects, reversal of synchro leads, hunting.	—	—	2

MODULE 5 DIGITAL TECHNIQUES / ELECTRONIC INSTRUMENT SYSTEMS

MODULE 5— DIGITAL TECHNIQUES / ELECTRONIC INSTRUMENT SYSTEMS	LEVEL			
	A1 A2 A3 A4	B3	B1	B2 B2L
5.1 *Electronic instrument systems* Typical arrangements of systems and cockpit layout of electronic instrument systems.	1	1	1	1
5.2 *Numbering systems* Numbering systems: binary, octal, and hexadecimal; Demonstration of conversions between the decimal and binary systems, octal and hexadecimal systems and vice versa.	—	—	1	2
5.3 *Data conversion* Analogue data, Digital data; Operation and application of analogue-to-digital and digital-to-analogue converters, inputs and outputs, limitations of various types.	—	—	1	2
5.4 *Data buses* Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications. Aircraft network/Ethernet.	—	—	2	2
5.5 *Logic circuits* (a) Identification of common logic gate symbols, tables and equivalent circuits; Applications used for aircraft systems, schematic diagrams.	—	—	2	2
(b) Interpretation of logic diagrams.	—	—	—	2

MODULE 5— DIGITAL TECHNIQUES / ELECTRONIC INSTRUMENT SYSTEMS	LEVEL			
	A1 A2 A3 A4	B3	B1	B2 B2L
5.6 *Basic computer structure* (a) Computer terminology (including bit, byte, software, hardware, CPU, IC, and various memory devices such as RAM, ROM, PROM); Computer technology (as applied in aircraft systems).	1	1	2	2
(b) Computer operation, layout, and interface of the major components in a microcomputer, including their associated bus systems; Information contained in single- and multi-address instruction words; Memory-associated terms; Operation of typical memory devices; Operation, advantages, and disadvantages of the various data storage systems.	—	—	—	2
5.7 *Microprocessors* Functions performed and overall operation of a microprocessor; Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit.	—	—	—	2
5.8 *Integrated circuits* Operation and use of encoders and decoders; Function of encoder types.	—	—	—	2
5.9 *Multiplexing* Operation, application and identification in logic diagrams of multiplexers and demultiplexers.	—	—	—	2
5.10 *Fibre optics* Advantages and disadvantages of fibre optic data transmission over electrical wire propagation; Fibre optic data bus; Fibre-optic-related terms; Terminations; Couplers, control terminals, remote terminals; Application of fibre optics in aircraft systems.	—	—	1	2
5.11 *Electronic displays* Principles of operation of common types of displays used in modern aircraft, including cathode-ray tubes (CRTs), light-emitting diodes (LEDs) and liquid crystal displays (LCDs).	1	1	2	2
5.12 *Electrostatic-sensitive devices* Special handling of components sensitive to electrostatic discharges; Awareness of risks and possible damage, component, and personnel antistatic protection devices.	1	1	2	2
5.13 *Software management control* Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programs.	—	1	2	2

MODULE 5— DIGITAL TECHNIQUES / ELECTRONIC INSTRUMENT SYSTEMS	LEVEL			
	A1 A2 A3 A4	B3	B1	B2 B2L
5.14 *Electromagnetic environment* Influence of the following phenomena on maintenance practices for electronic systems: EMC — Electromagnetic Compatibility, EMI Electromagnetic Interference, HIRF — High-Intensity Radiated Field;— Lightning / lightning protection.	—	1	2	2
5.15 *Typical electronic/digital aircraft systems* General arrangement of typical electronic/digital aircraft systems and associated BITE (Built-In Test Equipment), such as: (a) ACARS – ARINC Communication and Addressing and Reporting System, FBW - Fly-by-Wire, FMS- flight management system, IRS - inertial reference system; (b) ECAM - electronic centralised aircraft monitoring, EICAS - engine indication and crew alerting system, EFIS — electronic flight instrument system, GNSS — global navigation satellite system, TCAS — traffic alert collision avoidance system, Integrated Modular Avionics, Cabin Systems, Information Systems.	1	1	1	1

MODULE 6 - MATERIALS AND HARDWARE

MODULE 6— MATERIALS AND HARDWARE	LEVEL		
	A1 A2 A3 A4	B1 B3	B2 B2L
6.1 *Aircraft materials ferrous* (a) Characteristics, properties and identification of common alloy steels used in aircraft; Heat treatment and application of alloy steels.	1	2	1
(b) Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.	—	1	1

MODULE 6— MATERIALS AND HARDWARE	LEVEL		
	A1 A2 A3 A4	B1 B3	B2 B2L
(c) Repair and inspection procedures for ferrous materials, structures, and airframes.	—	2	1
6.2 *Aircraft materials non-ferrous* (a) Characteristics, properties and identification of common non-ferrous materials used in aircraft; Heat treatment and application of non-ferrous materials.	1	2	1
(b) Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.	—	1	1
(c) Repair and inspection procedures for non-ferrous materials, structures, and airframes.	—	2	1
6.3 *Aircraft materials composite and non-metallic* 6.3.1 *Composite and non-metallic materials other than wood and fabric* (a) Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; Sealant and bonding agents.	1	2	2
(b) Detection of defects/deterioration in composite and non-metallic materials.	1	2	—
(c) Repair of and inspection procedures for composite and non-metallic materials, structures, and airframes.	—	2	1
6.3.2 *Wooden structures* Construction methods of wooden airframe structures; Characteristics, properties and types of wood and glue used in aeroplanes; Preservation and maintenance of wooden structures; Types of defects in wood material and wooden structures; Detection of defects in wooden structures; Repair of wooden structures.	1	1	—
6.3.3 *Fabric covering* Characteristics, properties and types of fabrics used in aeroplanes; Inspection methods for fabrics; Types of defects in fabrics; Repair of fabric covering.	—	1	—
6.4 *Corrosion* (a) Chemical fundamentals; Formation by galvanic action process, microbiological contamination, mechanical stress.	1	1	1

MODULE 6— MATERIALS AND HARDWARE	LEVEL		
	A1 A2 A3 A4	B1 B3	B2 B2L
(a) Types of corrosion and their identification; Causes of corrosion; Material types, and their susceptibility to corrosion.	2	3	2
6.5 *Fasteners* 6.5.1 *Screw threads* Screw nomenclature; Thread forms, dimensions and tolerances for standard threads used in aircraft; Measuring screw threads.	2	2	2
6.5.2 *Bolts, studs, and screws* Bolt types: specification, identification and marking of aircraft bolts, international standards; Nuts: self-locking, anchor, standard types; Machine screws: aircraft specifications; Studs: types and uses, insertion, and removal; Self-tapping screws, dowels.	2	2	2
6.5.3 *Locking devices* Tab and spring washers, locking plates, split pins, pal-nuts, wire locking, quick- release fasteners, keys, circlips, cotter pins.	2	2	2
6.5.4 *Aircraft rivets* Types of solid and blind rivets: specifications and identification, heat treatment.	1	2	1
6.6 *Pipes and unions* (a) Identification and types of rigid and flexible pipes and their connectors used in aircraft;	2	2	2
(b) Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.	2	2	1
6.7 *Springs* Types of springs, materials, characteristics, and applications.	—	2	1
6.8 *Bearings* Purpose of bearings, loads, material, construction; Types of bearings and their application.	1	2	2
6.9 *Transmissions* Gear types and their application; Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns; Belts and pulleys, chains and sprockets.	1	2	2

MODULE 6— MATERIALS AND HARDWARE	LEVEL		
	A1 A2 A3 A4	B1 B3	B2 B2L
6.10 *Control cables* Types of cables; End fittings, turnbuckles and compensation devices; Pulleys and cable system components; Bowden cables; Aircraft flexible control systems.	1	2	1
6.11 *Electrical cables and connectors* Cable types, construction and characteristics; High-tension and coaxial cables; Crimping; Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes.	1	2	2

MODULE 7 – MAINTENANCE PRACTICES

MODULE 7— MAINTENANCE PRACTICES	LEVEL		
	A1 A2 A3 A4	B1 B3	B2 B2L
7.1 *Safety precautions aircraft and workshop* Aspects of safe working practices including precautions to be taken when working with electricity, gases (especially oxygen), oils, and chemicals. Fuel tank safety and fuel tank entry procedures and precautions. Awareness and precautions regarding aircraft equipped with ballistic recovery systems. Also, instructions for the remedial action to be taken in the event of a fire or another accident with one or more of these hazards, including information on fire-extinguishing agents.	3	3	3
7.2 *Workshop practices* Care of tools, control of tools, use of workshop materials; Dimensions, allowances and tolerances, workmanship standards; Calibration of tools and equipment, calibration standards.	3	3	3
7.3 *Tools* Common hand-tool types; Common power-tool types; Operation and use of precision-measuring tools; Lubrication equipment and methods; Operation, function, and use of electrical general test equipment.	3	3	3
7.4 *(Reserved)*			

MODULE 7— MAINTENANCE PRACTICES	LEVEL		
	A1 A2 A3 A4	B1 B3	B2 B2L
7.5 *Engineering drawings, diagrams, and standards* Drawing types and diagrams, their symbols, dimensions, tolerances and projections; Identification of title block information; Microfilm, microfiche, and computerised presentations; Specification 100 of the Air Transport Association (ATA) of America; Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL; Wiring diagrams and schematic diagrams.	1	2	2
7.6 *Fits and clearances* Drill sizes for bolt holes, classes of fits; Common system for fits and clearances; Schedule of fits and clearances for aircraft and engines; Limits for bow, twist and wear; Standard methods for checking shafts, bearings, and other parts.	1	2	1
7.7 *Electrical wiring interconnection system (EWIS)* Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated; Testing of crimp joints; Connector pin removal and insertion; Coaxial cables: testing and installation precautions; Identification of wire types, their inspection criteria and damage tolerance; Wiring protection techniques: cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding; High-Intensity Radiated Fields (HIRF) and protection principles; Soldering of electrical wires, EWIS installations, inspection, repair, maintenance, and cleanliness standards.	1	3	3
7.8 *Riveting* Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.	1	2	–
7.9 *Pipes and hoses* Bending and belling/flaring aircraft pipes; Inspection and testing of aircraft pipes and hoses; Installation and clamping of pipes.	1	2	–
7.10 *Springs* Inspection and testing of springs.	1	2	–
7.11 *Bearings* Testing, cleaning and inspection of bearings; Lubrication requirements for bearings; Defects in bearings and their causes.	1	2	–

MODULE 7— MAINTENANCE PRACTICES	LEVEL		
	A1 A2 A3 A4	B1 B3	B2 B2L
7.12 *Transmissions* Inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push pull rod systems.	1	2	–
7.13 *Control cables* Swaging of end fittings; Inspection and testing of control cables; Bowden cables; aircraft flexible control systems.	1	2	–
7.14 *Material handling* 7.14.1 *Sheet metal* Marking out and calculation of bend allowance; Sheet metal working, including bending and forming; Inspection of sheet metal work.	–	2	–
7.14.2 *Composite and non-metallic* Bonding practices; Environmental conditions; Inspection methods.	–	2	–
7.14.3 *Additive manufacturing* Common additive manufacturing techniques and their influence on the mechanical properties of the finished part; Inspection of additive manufactured parts and common production failures.	1	1	1
7.15 *(Reserved)*			
7.16 *Aircraft weight and balance* (a) Calculation of centre-of-gravity / balance limits: use of relevant documents.	–	2	2
(b) Preparation of aircraft for weighing; Aircraft weighing.	–	2	–
7.17 *Aircraft handling and storage* Aircraft taxiing/towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions; Aircraft storage methods;	2	2	2
7.18 *Disassembly, inspection, repair, and assembly techniques* (a) Types of defects and visual inspection techniques; Corrosion removal, assessment and reprotection;	2	3	3
(b) General repair methods, structural repair manual; Ageing, fatigue,	–	2	–

MODULE 7— MAINTENANCE PRACTICES	LEVEL		
	A1 A2 A3 A4	B1 B3	B2 B2L
and corrosion control programmes;	–	2	1
(c) Non-destructive inspection techniques including penetrant, radiographic, eddy current, magnetic particle, ultrasonic and borescope inspections; including practical training in colour contrast penetrant inspection;	2	2	2
(d) Disassembly and reassembly techniques;	–	2	2
(e) Troubleshooting techniques.			
7.19 *Abnormal events*			
(a) Inspections following lightning strikes and HIRF penetration;	2	2	2
(b) Inspections following abnormal events such as heavy landings and flight through turbulence.	2	2	–
7.20 *Maintenance procedures* Maintenance planning; Modification procedures; Stores procedures; Certification/release procedures; Interface with aircraft operation; Maintenance Inspection / Quality Control / Quality Assurance; Additional maintenance procedures; Control of life-limited components.	1	2	2
7.21 Documentation and communication Documentation: elements and criteria for writing work reports, troubleshooting reports, and shift handover instructions. Communication: clear, comprehensive, and concise.	1	2	2

MODULE 8 - BASIC AERODYNAMICS

MODULE 8 – BASIC AERODYNAMICS	LEVEL	
	A1 A2 A3 A4 B3	B1 B2 B2L
8.1 *Physics of the atmosphere* International Standard Atmosphere (ISA), and its application to aerodynamics.	1	2

MODULE 8 – BASIC AERODYNAMICS	LEVEL	
	A1 A2 A3 A4 B3	B1 B2 B2L
8.2 *Aerodynamics* Airflow around a body; Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, upwash and downwash, vortices, stagnation; The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash-in and wash-out, fineness ratio, wing shape and aspect ratio; Thrust, weight, aerodynamic resultant; Generation of lift and drag angle of attack, lift coefficient, drag coefficient, polar curve, stall; Aerofoil contamination including ice, snow, and frost.	1	2
8.3 *Theory of flight* Relationship between lift, weight, thrust and drag; Glide ratio; Steady-state flights, performance; Theory of the turn; Influence of load factor: stall, flight envelope, and structural limitations; Lift augmentation.	1	2
8.4 *High-speed airflow* Speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, critical Mach number, compressibility buffet, shock wave, aerodynamic heating, area rule; Factors that affect airflow in engine intakes of high-speed aircraft; Effects of sweepback on critical Mach number.	1	2
8.5 *Flight stability and dynamics* Longitudinal, lateral, and directional stability (active and passive).	1	2

MODULE 9 - HUMAN FACTORS

MODULE 9 – HUMAN FACTORS	LEVEL
	ALL
9.1 *General* The need to take human factors into account when performing maintenance; Incidents attributable to human factors/human error; Murphy's law.	2
9.2 *Human performance and limitations* Vision; Hearing; Information processing; Attention and perception; Memory; Claustrophobia and physical access.	2

MODULE 9 – HUMAN FACTORS	LEVEL ALL
9.3 *Social psychology* Accountability and responsibility: individual and group; Motivation and demotivation; Peer pressure; Cultural issues; Teamwork; Management, supervision, and leadership.	1
9.4 *Factors that affect performance* Fitness/health; Stress: domestic and work related; Time pressure and deadlines; Workload: overload, underload, and workload management; Sleep and fatigue, shift work; Alcohol, medication, drug abuse; Lack of manpower.	2
9.5 *Physical environment* Noise and fumes; Illumination; Climate and temperature; Motion and vibration; Working environment; Situational awareness.	1
9.6 *Tasks* Physical work; Repetitive tasks, complacency; Visual inspection; Complex systems; Critical maintenance tasks and error-capturing methods; Technical documentation: access, use, and quality.	1
9.7 *Communication* Within and between teams; Work logging and recording; Shift handover; Keeping up to date, currency; Dissemination of information.	2
9.8 *Human error* Error models and theories; Types of error in maintenance tasks; Implications of errors (e.g. accidents); Organisational errors; Avoiding and managing errors.	2
9.9 *Safety management* Risk management; Occurrence reporting; Safety culture Just culture; Identifying, avoiding, and reporting hazards; Organisational human-factors programme: professionalism and integrity, error-provoking behaviour, reporting errors, disciplinary policy, error investigation, action to address problems, feedback, assertiveness;	2

MODULE 9 –HUMAN FACTORS	LEVEL ALL
Dealing with emergencies.	
9.10 *The 'Dirty Dozen' and the risk-mitigation* *The 'Dirty Dozen' :* The twelve most common human -factors errors in maintenance: Lack of communication, Lack of teamwork, Lack of assertiveness, Complacency, Fatigue, Stress, Lack of knowledge, Lack of resources, Lack of awareness, Distraction, Pressure, Norms. Risk-mitigation methods.	2

MODULE 10 AVIATION LEGISLATION

MODULE 10 –AVIATION LEGISLATION	LEVEL A1 A 2 A 3 A 4	LEVEL B 1 B 2 B 2 L B 3
10.1 *Regulatory framework* Role of: – International Civil Aviation Organization (ICAO); – Directorate General of Civil Aviation (DGCA), India; – The Aircraft Act and Rules made thereunder relating to airworthiness; – CAR-21, CAR-M, CAR-145, CAR-66, CAR 147, CAR ML, CAR- CAMO, CAR-CAO – the relationship between regulations and AMC, GM, AAC etc. – occurrence reporting according to CAR Section 2 Series C Part I, CAR M, CAR ML, CAR-145 and CAR-CAO; – Aeronautical Information Circulars (Applicable to Aircraft Maintenance and Release) – the relationship between Initial and Continuing Airworthiness (such as CAR 21, CAR M, CAR-145, CAR-66, CAR-147, CAR-ML, CAR-CAMO, and CAR-CAO) and regulations related to the Air Operations and regulation related to the Air Crew	1	1
10.2 *Certifying staff maintenance* General understanding of CAR-66 maintenance licences with the associated privileges and authorisations, and how to exercise them properly for the different aircraft categories.	2	2
10.3 *Approved maintenance organisations* Detailed understanding of CAR-145 and CAR -CAO	2	2

MODULE 10 ~~A~~VIATION LEGISLATION	LEVEL	
	A1 A 2 A 3 A 4	B 1 B 2 B 2 L B 3
10.4 *Independent certifying staff* Privileges, responsibilities, record-keeping, limitations, and oversight according to CAR-M, CAR -66 and CAR -ML.	—	3
10.5 *Air operations* General understanding of regulation relating to air operations; Differences between commercial and non-commercial air operations, and their influence on aircraft maintenance; Air Operator Certificates (AOCs)/ Air Operator Permits (AOP) Air operator responsibilities, in particular regarding continuing airworthiness and maintenance; Specialised operations / specific approvals: ETOPS, CAT I/II/III, and BRNAV. Minimum Equipment List (MEL) and Configuration Deviation List (CDL); Aircraft placarding and markings; Documents to be carried on board: — Certificate of Airworthiness / Restricted Certificate of Airworthiness; — Airworthiness Review Certificate; — Permit to Fly; — Certificate of Registration; — Noise Certificate; — Weight and Balance report; — Radio Station Licence.	1	1
10.6 *Certification of aircraft, parts, and appliances* Basic understanding of CAR 21	2	2
10.7 *Continuing airworthiness* General understanding of the CAR 21 requirements on continuing airworthiness; General understanding of CAR-M, CAR-ML, CAR-CAMO, and Part-CAO; Aircraft Maintenance Programme.	2	2
10.8 *Oversight principles in continuing airworthiness*	1	1
10.9 *Maintenance and certification with respect to aircraft other than aeroplanes and helicopters* *Maintenance and certification of Microlight, light sport aircraft, gyrocopter, glider, balloon or an airship* Applicable national and international requirements for component maintenance, welding, painting, NDT, etc.	—	1
10.10 *Cybersecurity in aviation maintenance* Regulation on the introduction of organisation requirements for the management of information security risks related to aeronautical information systems used in civil aviation.	1	1

MODULE 11 - AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 11— AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL				
	A1	A2	B1.1	B1.2	B3
11.1 *Theory of flight* (a) Aeroplane aerodynamics and flight controls Operation and effect of: — roll control: ailerons and spoilers; — pitch control: elevators, stabilators, variable incidence stabilisers and canards; — yaw control, rudder limiters; elevons, — ruddervators; — high-lift devices, slots, slats, flaps, flaperons; — drag-inducing devices, spoilers, lift dumpers, speed brakes; — trim tabs, servo tabs, control surface bias.	1	1	2	2	1
(b) Aeroplane: other aerodynamic devices Operation and effect of: — balance and antibalance (leading) tabs; — spring tabs; — mass balance, aerodynamic balance panels; — effects of wing fences, saw tooth leading edges; — boundary layer control using vortex generators, stall wedges or leading-edge devices.	1	1	2	2	1
11.2 *Airframe structures (ATA 51)* (a) General concepts: — Zonal and station identification systems; — Electrical bonding; — Lightning strike protection provisions.	2	2	2	2	2
(b) Airworthiness requirements for structural strength: — Structural classification: primary, secondary, and tertiary; Fail-safe, safe-life, damage-tolerance — concepts; — Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; — Drains and ventilation provisions; — System installation provisions.	2	2	2	2	2

MODULE 11— AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL				
	A1	A2	B1.1	B1.2	B3
(c) Construction methods — Stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, skinning, anticorrosive protection, wing, empennage and engine attachments; — Structure assembly techniques: riveting, bolting, — bonding; Methods of surface protection, such as chromating, anodising, painting; — Surface cleaning; — Airframe symmetry: methods of alignment and symmetry checks.	1	1	2	2	2
11.3 *Airframe structures aeroplanes* 11.3.1 *Fuselage, doors, windows (ATA 52/53/56)* (a) Construction principles — Construction and pressurisation sealing; — Wing, stabiliser, pylon, and undercarriage attachments; — Seat installation; — Doors and emergency exits: construction, mechanisms, operation; — Windows and windscreen construction and mechanisms.	1	1	2	2	1
(b) Airborne towing devices (glider, banner, target)	1	1	1	1	1
(c) Doors – Doors and emergency exits: safety devices; – Cargo loading system.	1	1	2	1	—
11.3.2 *Wings (ATA 57)* Constructi on; Fuel storage; Landing gear, pylon, control surface and high lift/drag attachments.	1	1	2	2	1
11.3.3 *Stabilisers (ATA 55)* Construction; Control surface attachment.	1	1	2	2	1
11.3.4 *Flight control surfaces (ATA 55/57)* Construction and attachments; Balancing mass and aerodynamics.	1	1	2	2	1
11.3.5 *Nacelles/pylons (ATA 54)* Nacelles/Pylon — s: — Constructio — n, Firewalls, Engine mounts.	1	1	2	2	1

MODULE 11— AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL				
	A1	A2	B1.1	B1.2	B3
11.4 *Air conditioning and cabin pressurisation (ATA 21)* (a) Pressurisation Pressurisation systems; Cabin pressure controllers, control, and safety valves; Control and indication.	1	1	3	3	—
(b) Air supply Sources of air supply including engine bleed, APU and ground cart; Distribution systems.	1	-	3	-	—
(c) Air conditioning Air-conditioning systems; Air cycle and vapour cycle machines; Flow, temperature and humidity control system; Control and indication control valves.	1	—	3	-	—
(d) Safety and warning devices Protection and warning devices.	1	1	3	3	—
(e) Heating and ventilation systems.	—	1	-	3	1
11.5 *Instruments / avionics systems* 11.5.1 *Instrument systems (ATA 31)* Pitot-static: Airspeed indicators, Vertical speed indicators, Altimeters; Gyroscopic: Gyroscopic principles, Artificial horizons, Attitude directors, Direction indicators, Horizontal situation indicators (HSI), Slip indicators, Turn indicators, Turn coordinators; Compass systems: systems, direct reading, remote reading, Stall-warning systems and angle-of-attack indicating systems, Glass cockpit, Indications of other aircraft systems.	1	1	2	2	2
11.5.2 *Avionics systems* Fundamentals of system layouts and operation of: Autoflight **(ATA 22)**; Communication systems **(ATA 23)**: — Very High Frequency (VHF) communications, — High Frequency (HF) communications, — Satellite Communications (SATCOM), — Controller– pilot data link communications — (CPDLC), Audio systems, — Emergency Locator Transmitters (ELTs), — Cockpit Voice Recorder (CVR); Navigation systems **(ATA 34)**: — Very high frequency omnidirectional range	1	1	1	1	1

MODULE 11— AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL				
	A1	A2	B1.1	B1.2	B3
— (VOR), Automatic direction finder (ADF), — Instrument landing system (ILS), Microwave landing system — (MLS), — Flight director systems (FDSs), distance-measuring equipment (DME), — Area navigation (RNAV) systems, Flight management — systems (FMSs), Satellite — navigation systems, — Air traffic control transponder, secondary surveillance radar, — Traffic alert and collision avoidance system — (TCAS), Weather avoidance radar, — Radio altimeter, — Inertial navigation system (INS), — ARINC (Aeronautical Radio Incorporated) communication and reporting. Types and uses of avionics general test equipment.					
11.6 *Electrical power* ***(ATA 24)*** — Installation and operation of — batteries; DC power generation; — AC power generation; Emergency power — generation; Voltage — regulation; — Power distribution; — Inverters, transformers, — rectifiers; Circuit protection; — External/ground power.	1	1	3	3	3
11.7 *Equipment and furnishings* ***(ATA 25)***					
(a) Emergency equipment:	2	2	2	2	2
Emergency equipment requirements.	1	1	1	1	—
(b) Cabin and cargo layout:					
— Seats, harnesses, and belts; — Cabin layout; — Equipment layout; — Cabin furnishing installation; — Galley installation; — Cargo handling and retention equipment; — Airstairs.					
11.8 *Fire protection* ***(ATA 26)***					
(a) Fire and smoke detection system, and fire-extinguishing systems:	1	1	1	1	—
— Fire and smoke detection and warning — systems; Fire-extinguishing systems; — System tests.	1	1	1	1	1
(b) Portable fire extinguisher.					

MODULE 11— AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL				
	A1	A2	B1.1	B1.2	B3
11.9 Flight controls ***(ATA 27)***					
(a) Primary and secondary flight controls: — Primary controls: aileron, elevator, rudder, — spoiler; Trim control, trim tabs; — High-lift devices; — System operation: manual; — Gust locks and gust lock systems; — Artificial feel, yaw damper, Mach trim, rudder — limiter; Stall-warning systems.	1	1	3	3	2
(b) Actuation and — protection: Active load control; — Lift dump, speed brakes; Hydraulic, pneumatic — systems; Stall-protection — systems.	1	—	3	—	—
(c) System operation: Electrical systems, fly-by-wire systems.	1	—	3	—	—
(d) Balancing and rigging.	1	1	3	3	2
11.10 *Fuel systems* ***(ATA 28, ATA 47)***					
(a) Systems: System layout; Fuel tanks; Supply systems.	1	1	3	3	1
(b) Fuel handling: Cross-feed and transfer; Refuelling and defuelling.	1	1	3	3	1
(c) Indication and warnings.	1	1	3	3	1
(d) Special systems: — Dumping, venting, and — draining; Inert gas systems.	1	—	3	—	—
(e) Balancing: Longitudinal balance fuel systems.	1	—	3	—	—
11.11 *Hydraulic power* ***(ATA 29)***					
(a) System description: System layout; Hydraulic fluids; Hydraulic reservoirs and accumulators; Filters; Power distribution.	1	1	3	3	2
(b) System operation (1): Pressure generation: electric and mechanical; Pressure control; Indication and warning systems; Servicing.	1	1	3	3	2
	1	—	3	—	—

MODULE 11— AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL				
	A1	A2	B1.1	B1.2	B3
(c) System operation (2): Pressure generation: pneumatic; Emergency pressure generation; Interface with other systems.					
11.12 *Ice and rain protection* ***(ATA 30)***					
(a) Principles: Ice formation, classification, and detection.	1	1	3	3	1
(b) De-icing: De-icing systems: electrical, hot-air, pneumatic, chemical; Probe and drain heating.	1	1	3	3	1
(c) Anti-icing: Anti-icing systems: electrical, hot-air, chemical.	1	—	3	—	—
(d) Wipers: Wiper systems.	1	1	3	3	1
(e) Rain-repellent systems.	1	—	3	—	—
11.13 *Landing gear* ***(ATA 32)***					
(a) Description: Construction, shock absorbing; Tyres.	2	2	3	3	2
(b) Systems: Extension and retraction systems: normal and emergency; Indications and warnings; Wheels, brakes, antiskid, and autobraking; Steering.	2	2	3	3	2
(c) Air–ground sensing.	2	—	3	—	—
(d) Tail protection: Skids.	2	2	3	3	2
11.14 *Lights* ***(ATA 33)*** External: navigation, anticollision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	2	2	3	3	2
11.15 *Oxygen* ***(ATA 35)*** System layout: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings.	1	1	3	3	2
11.16 *Pneumatic / vacuum* ***(ATA 36)***					
(a) Systems: System layout; Sources: engine / APU (Auxiliary Power Unit), compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interface with other	1	1	3	3	2

MODULE 11— AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL				
	A1	A2	B1.1	B1.2	B3
systems. (b) Pumps: Pressure and vacuum pumps.	1	1	3	3	2
11.17 *Water / waste* ***(ATA 38)*** (a) Systems: Water system layout, supply, distribution, servicing and draining; Toilet system layout, flushing and servicing.	2	2	3	3	2
(b) Corrosion: Corrosion aspects.	2	2	3	3	2
11.18 *Onboard maintenance systems* ***(ATA 45)*** Central maintenance computers; Data-loading system; Electronic library system; Printing systems; Structure monitoring (damage-tolerance monitoring). Bleed management, air pressure control, air ventilation and control, avionics and cockpit ventilation control, temperature control, air traffic communication, avionics communication router, electrical load management, circuit breaker monitoring, electrical system BITE, fuel management, braking control, steering control, landing gear extension and retraction, tyre pressure indication, oleo pressure indication, brake temperature monitoring, etc.	1	—	2	—	—
(b) Typical system layout.	1	—	2	—	—
11.20 *Cabin systems* ***(ATA 44)*** System architecture, operation, and control of systems for: — passenger in-flight entertainment; — communication within the aircraft (Cabin intercommunication data system (CIDS); — communication between the aircraft cabin and ground stations; — including voice, data, music, and video transmission. CIDS interface between cockpit/cabin crew and cabin systems. Data exchange between the different related line replaceable units (LRUs). Flight attendant panels (FAPs). Cabin network server (CNS) and interfaces with the following systems: — Data/radio communication; Cabin — core system (CCS); — In-flight entertainment system (IFES); — External communication system — (ECS); Cabin mass memory system — (CMMS); Cabin monitoring system — (CMS); Miscellaneous cabin systems — (MCSs); and Other systems. Cabin network server (CNS) hosting functions: — Access to predeparture/departure reports; — Email/intranet/internet access; passenger — database; In-flight entertainment system; — External communication	1	—	2	—	—

MODULE 11— AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL				
	A1	A2	B1.1	B1.2	B3
system; Cabin mass memory system; Cabin monitoring system; Miscellaneous cabin system.					
11.21 *Information systems* ***(ATA 46)*** System architecture, operation, and control of: — Storage and electronic library; — Updating; — Retrieving of digital information; — Air traffic and information management systems (ATIMS) and network server systems; — Aircraft general information system; — Flight deck information system; — Maintenance information system; — Passenger cabin information system; — Miscellaneous information systems; — Other linked systems.	1	—	2	—	—

MODULE 12 - HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 12— HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL	
	A3 A4	B1.3 B1.4
12.1 *Theory of flight rotary wing aerodynamics* Terminology; Effects of gyroscopic precession; Torque reaction and directional control; Dissymmetry of lift, blade tip stall; Translating tendency and its correction; Coriolis effect and compensation; Vortex ring state, power setting, overpitching; Auto-rotation; Ground effect.	1	2
12.2 *Flight control systems* ***(ATA 67)*** Cyclic control; Collective control; Swashplate; Yaw control: antitorque control, tail rotor, bleed air; Main-rotor head: design and operation features; Blade dampers: function and construction; Rotor blades: main- and tail-rotor blade construction and attachment; Trim control, fixed and adjustable stabilisers; System operation: manual, hydraulic, electrical, fly-by-wire; Artificial feel; Balancing and rigging.	2	3

MODULE 12— HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL	
	A3 A4	B1.3 B1.4
12.3 *Blade tracking and vibration analysis* ***(ATA 18)*** Rotor alignment; Main-rotor and tail-rotor tracking; Static and dynamic balancing; Vibration types, and vibration reduction methods; Ground resonance.	1	3
12.4 *Transmission* Gear boxes, main and tail rotors; Clutches, free wheel units and rotor brake; Tail-rotor drive shafts, flexible couplings, bearings, vibration dampers and bearing hangers.	1	3
12.5 *Airframe structures* (a) General concept Airworthiness requirements for structural strength; Structural classification: primary, secondary, tertiary; Fail-safe, safe-life, damage-tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions; Lightning strike protection provisions.	2	2
(b) Construction methods for the principal elements Stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, skinning and anticorrosive protection; Pylon, stabiliser and undercarriage attachments; Seat installation; Doors: construction, mechanisms, operation, and safety devices; Windows and windscreen construction; Fuel storage; Firewalls; Engine mounts; Structure assembly techniques: riveting, bolting, bonding; Methods for surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods for alignment and symmetry checks.	1	2
12.6 *Air conditioning* ***(ATA 21)*** 12.6.1 *Air supply* Sources of air supply, including engine bleed and ground cart.	1	2
12.6.2 *Air conditioning* Air-conditioning systems; Distribution systems; Flow and temperature control systems; Protection and warning devices.	1	3

MODULE 12— HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL	
	A3 A4	B1.3 B1.4
12.7 *Instruments / avionics systems* 12.7.1 *Instrument systems* ***(ATA 31)*** Pitot-static: altimeter, airspeed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading; Vibration indicating systems / health and usage monitoring systems (HUMSs); Glass cockpit; Indications of other aircraft systems.	1	2
12.7.2 *Avionics systems* Fundamentals of system layouts and operation of: Autoflight **(ATA 22)**; Communications **(ATA 23)**: — Very high frequency (VHF) — communications, High-frequency (HF) communications, Satellite — communications (SATCOM), — Controller- pilot data link communications (CPDLC), — Audio systems, — Emergency locator transmitters — (ELTs), Cockpit voice recorder (CVR); Navigation systems **(ATA 34)**:	1	1
— Very high frequency omnidirectional range (VOR), — Automatic direction finding (ADF), — Instrument landing system (ILS), Microwave landing — system (MLS), — Flight director systems (FDSs), distance-measuring equipment — (DME), Area navigation (RNAV) systems, — Flight management systems (FMSs), Satellite navigation — systems, Inertial navigation — system (INS), — Air traffic control transponder, secondary surveillance — radar, Traffic alert and collision avoidance system (TCAS), — Weather avoidance radar, — Radio altimeter, — ARINC communication and reporting. Types and uses of general test equipment for avionics.		
12.8 *Electric power* ***(ATA 24)*** Installation and operation of batteries; DC power generation, AC power generation; Emergency power generation; Voltage regulation, circuit protection; Power distribution; Inverters, transformers, rectifiers; External/Ground power.	1	3
12.9 *Equipment and furnishings* ***(ATA 25)*** (a) Emergency equipment requirements; Seats, harnesses, and belts; Lifting systems.	2	2

MODULE 12— HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL	
	A3 A4	B1.3 B1.4
(b) Emergency flotation systems; Cabin layout, cargo retention; Equipment layout; Cabin furnishing installation.	1	1
12.10 *Fire protection* ***(ATA 26)*** (a) Fire and smoke detection and warning systems; Fire-extinguishing systems; System tests.	1	3
(b) Portable fire extinguishers.	1	1
12.11 *Fuel systems* ***(ATA 28)*** System layout; Fuel tanks; Supply systems; Dumping, venting, and draining; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling.	1	3
12.12 *Hydraulic power* ***(ATA 29)*** System layout; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical, pneumatic; Emergency pressure generation; Filters; Pressure control; Power distribution; Indication and warning systems; Interface with other systems; Servicing.	1	3
12.13 *Ice and rain protection (ATA 30)* Ice formation, classification, and detection; Anti-icing and de-icing systems: electrical, hot-air, and chemical; Rain repellent and removal; Probe and drain heating; Wiper system.	1	3
12.14 *Landing gear* ***(ATA 32)*** (a) System description and operation: Construction, shock absorbing; Extension and retraction systems: normal and emergency; Wheels, tyres, brakes; Steering;	2	3

MODULE 12— HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL	
	A3 A4	B1.3 B1.4
Skids, floats. (b) Sensors: Indications and warning; Air ground sensing.	2	3
12.15 *Lights* ***(ATA 33)*** External: navigation, landing, taxiing; Internal: cabin, cockpit, cargo; Emergency.	2	3
12.16 *(Reserved)*		
12.17 *Integrated modular avionics (IMA)* ***(ATA 42)*** (a) Overall system description and theory Functions that may be typically integrated in the integrated modular avionics (IMA) modules: Bleed management, air pressure control, air ventilation and control, avionics and cockpit ventilation control, temperature control, air traffic communication, avionics communication router, electrical load management, circuit breaker monitoring, electrical system BITE, fuel management, steering control, landing gear extension and retraction, tyre pressure indication, oleo pressure indication, brake temperature monitoring, etc.; Core System; Network Components.	1	2
(b) Typical system layouts.	1	2
12.18 *Onboard maintenance systems* ***(ATA 45)*** Central maintenance computers; Data-loading system; Electronic library system.	1	2
12.19 *Information systems* ***(ATA 46)*** The units and components which furnish a means of storing, updating, and retrieving digital information traditionally provided on paper, microfilm or microfiche. They include units that are dedicated to the information storage and retrieval function, such as the electronic library mass storage and controller. They do not include units or components installed for other uses and shared with other systems, such as flight deck printer or general-use display. Typical examples include air traffic and information management systems and network server systems. Aircraft general information system. Flight deck information system. Maintenance information system. Miscellaneous information system.	1	2

MODULE 13 AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS

C/N: Communication and Navigation; **Ins.**: Instruments; **A/F**: Autoflight; **Sur.**: Surveillance; **A/S**: Airframe and Systems

MODULE 13– AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL						
	B2	B2L	B2L	B2L	B2L	B2L	B2L
		Basic	C/N	Ins.	A/F	Sur.	A/S
13.1 *Theory of flight* (a) Aeroplane aerodynamics and flight controls Operation and effect of: — roll control: ailerons and spoilers; — pitch control: elevators, stabilators, variable incidence stabilisers and canards; and — yaw control: rudder limiters; — control using elevons, ruddervators; high-lift devices: — slots, slats, flaps; — drag-inducing devices: spoilers, lift dumpers, speed brakes; trim tabs, servo tabs, and control surface — bias.	1	1	—	—	—	—	—
(b) Rotary wing aerodynamics Terminology; Operation and effect of cyclic, collective, and antitorque controls.	1	1	—	—	—	—	—
13.2 *Structures general concepts* (a) General concepts; Zonal and station identification systems; Electrical bonding; Lightning strike protection provisions.	2	2	—	—	—	—	—
(b) Fundamentals of structural systems.	1	1	—	—	—	—	—
13.3 *Autoflight* ***(ATA 22)***							
(a) Fundamentals of automatic flight control: — Working principles and current — terminology; Command signal processing; — Modes of operation: roll, pitch, and yaw channels; — Yaw dampers; — Stability augmentation system in — helicopters; Automatic trim control; Autopilot navigation aids interface.	3	—	—	—	3	—	—

MODULE 13— AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL						
	B2	B2L Basic	B2L C/N	B2L Ins.	B2L A/F	B2L Sur.	B2L A/S
(b) Autothrottle systems and automatic landing systems: — Principles and categories; — Modes of operation; — Approach; — Glideslope; Land, go- — around; — System monitors and failure conditions.	3	—	—	—	3	—	—
13.4 *Communication/navigation (ATA 23/34)* (a) Fundamentals of communication and navigation systems: — Radio wave propagation, antennas, transmission lines, communication, receiver, and transmitter; Working principles of the following systems: — Very high frequency (VHF) — communications; High-frequency (HF) communications; Satellite — communications (SATCOM); Controller — pilot data link communications (CPDLC); — Audio systems; — Emergency locator transmitters — (ELTs); Cockpit voice recorder (CVR); — Very high frequency omnidirectional range (VOR); Automatic direction finding (ADF); — Instrument landing system (ILS); — Microwave landing system — (MLS); — Flight director systems (FDSs), distance-measuring equipment (DME); — Area navigation (RNAV) systems; Flight management — systems (FMSs); — Global navigation satellite systems (GNSSs), Global Positioning System (GPS), ground-based augmentation system (GBAS), satellite-based augmentation system (SBAS) such as the European geostationary navigation overlay service (EGNOS) and the wide area augmentation system (WAAS); Data link and two-way data link.	3	—	3	—	—	—	—

MODULE 13— AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL						
	B2	B2L Basic	B2L C/N	B2L Ins.	B2L A/F	B2L Sur.	B2L A/S
— (b) Fundamentals of aircraft surveillance systems: — Air traffic control transponder, secondary surveillance radar; — Traffic alert and collision avoidance system (TCAS); — Weather avoidance — radar; Radio altimeter; — Automatic dependent surveillance–broadcast (ADS-B) and its other associated services such as FIS-B, TIS-B and multilink; — Inertial navigation system (INS); — ARINC (Aeronautical Radio Incorporated) communication and reporting.	3	—	—	—	—	3	—
13.5 *Electric power* ***(ATA 24)*** — Installation and operation of batteries; — DC power generation; AC — power generation; — Emergency power generation; — Voltage regulation; — Power distribution; — Inverters, transformers, — rectifiers; Circuit protection; — External/ground power.	3	3	—	—	—	—	—
13.6 *Equipment and furnishings* ***(ATA 25)*** Electronic emergency equipment requirements.	3	—	—	—	—	—	—
13.7 *Flight controls* (a) Primary and secondary flight controls **(ATA 27)**: Primary controls: aileron, elevator, rudder, spoiler; Trim control: trim tabs; High-lift devices; System operation: manual; Gust locks and gust lock systems; Artificial feel, yaw damper, Mach trim, rudder limiter; Stall-warning systems.	2	—	—	—	2	—	—
(b) Actuation and protection: — Active load control; — Lift dump, speed brakes; — Hydraulic, pneumatic systems; — Stall-protection systems.	2	—	—	—	2	—	—

MODULE 13— AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL						
	B2	B2L Basic	B2L C/N	B2L Ins.	B2L A/F	B2L Sur.	B2L A/S
(c) System operation: – System operation: electrical, fly-by-wire.	3	—	—	—	3	—	—
(d) Rotorcraft flight controls **(ATA 67)**: Rotorcraft controls: cyclic control, collective control, swashplate, yaw control	2	—	—	—	2	—	—
13.8 *Instruments **(ATA 31)*** — Classification; Atmosphere; — Terminology; — Pressure-measuring devices and systems; Pitot-static systems; — Altimeters; — Vertical speed indicators; — Airspeed indicators; — Machmeters; — Altitude-reporting/-alerting systems; Air-data computers; — Instrument pneumatic systems; — Direct-reading pressure and temperature gauges; — Temperature-indicating systems; — Gyroscopic principles; — Artificial horizons; Slip indicators; — Directional gyros; — Ground proximity warning systems (GPWSs); Compass systems; — Flight data recording systems (FDRSs); — Electronic flight instrument systems (EFISs) typical system arrangements and cockpit layout; — Instrument warning systems, including master warning systems and centralised warning panels; — Stall-warning systems and angle-of-attack indicating systems; — Vibration measurement and indication; Glass cockpit; — Types and uses of general test equipment for avionics.	3	—	—	3	—	—	—
13.9 *Lights **(ATA 33)*** External: navigation, anticollision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	3	3	—	—	—	—	—

MODULE 13— AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL						
	B2	B2L Basic	B2L C/N	B2L Ins.	B2L A/F	B2L Sur.	B2L A/S
13.10 *Onboard maintenance systems* ***(ATA 45)*** Central maintenance computers; Data-loading system; Electronic library system; Printing system; Structure monitoring system (damage-tolerance monitoring).	3	—	—	—	—	—	—
13.11 *Air conditioning and cabin pressurisation* ***(ATA 21)*** (a) Pressurisation: Pressurisation systems; Cabin pressure controllers, control and safety valves; Control and indication	3	—	—	—	—	—	3
(b) Air supply: Sources of air supply including engine bleed, APU and ground cart; Distribution systems	1	—	—	—	—	—	1
(c) Air conditioning.	3	—	—	—	—	—	3
(d) Safety and warning devices.	3	—	—	—	—	—	3
13.12 Fire protection **(ATA 26)** (a) Fire and smoke detection system and fire- extinguishing systems; — Fire and smoke detection and warning — systems; Fire-extinguishing systems; — System tests.	3	—	—	—	—	—	3
(b) Portable fire extinguisher.	1	—	—	—	—	—	1
13.13 *Fuel systems* ***(ATA 28, ATA 47)*** (a) System layout: System layout; Fuel tanks; Supply systems.	1	—	—	—	—	—	1
	2	—	—	—	—	—	2
(b) Fuel handling; Cross-feed and transfer; Refuelling and defuelling.	3	—	—	—	—	—	3
(c) Indications and warnings.	1	—	—	—	—	—	1
(d) Special systems: Dumping, venting and draining; Inert gas systems.	3	—	—	—	—	—	3
(e) Balancing: Longitudinal balance fuel systems.							

MODULE 13— AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL						
	B2	B2L	B2L	B2L	B2L	B2L	B2L
		Basic	C/N	Ins.	A/F	Sur.	A/S
13.14 *Hydraulic power* ***(ATA 29)***							
(a) System layout: System layout; Hydraulic fluids; Hydraulic reservoirs and accumulators; Filters; Power distribution.	1	—	—	—	—	—	1
(b) System operation (1): Pressure generation: electric and mechanical; Pressure control; Indication and warning systems; Servicing.	3	—	—	—	—	—	3
(c) System operation (2): Pressure generation: pneumatic; Emergency pressure generation; Interface with other systems.	3	—	—	—	—	—	3
13.15 *Ice and rain protection* ***(ATA 30)*** (a) Principles: Ice formation, classification, and detection.	2	—	—	—	—	—	2
(b) De-icing: De-icing systems: electrical, hot-air, pneumatic, and chemical; Probe and drain heating.	3	—	—	—	—	—	3
(c) Anti-icing: Anti-icing systems: electrical, hot-air, and chemical.	2	—	—	—	—	—	2
(d) Wiper systems.	1	—	—	—	—	—	1
(e) Rain repellent.	1	—	—	—	—	—	1
13.16 *Landing gear* ***(ATA 32)*** (a) Description: Construction, shock absorbing; Tyres.	1	—	—	—	—	—	1
(b) Systems: Extension and retraction systems: normal and emergency; Indications and warnings; Wheels, brakes, antiskid, and autobraking; Steering	3	—	—	—	—	—	3
(c) Air ground sensing	3	—	—	—	—	—	3
13.17 *Oxygen (ATA 35)* System layout: cockpit, cabin; Sources, storage, charging, and distribution; Supply regulation; Indications and warnings.	3	—	—	—	—	—	3
13.18 *Pneumatic/vacuum* ***(ATA 36)*** System layout; Sources: engine/APU, compressors, reservoirs, ground supply;	2	—	—	—	—	—	2

MODULE 13— AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL						
	B2	B2L Basic	B2L C/N	B2L Ins.	B2L A/F	B2L Sur.	B2L A/S
Pressure control; Distribution; Indications and warnings; Interfaces with other systems.							
13.19 *Water/waste* ***(ATA 38)*** Water system layout, supply, distribution, servicing, and draining; Toilet system layout, flushing and servicing.	2	—	—	—	—	—	2
13.20 *Integrated modular avionics (IMA)* ***(ATA 42)*** (a) Overall system description and theory: Core system; Network components. Note: Functions that may be typically integrated into the integrated modular avionics (IMA) modules are, among others: – Bleed management; Air pressure control; – Air ventilation and control; – Avionics and cockpit ventilation control, temperature control; – traffic communication; Avionics communication router; Electrical load management; Air Circuit breaker monitoring; – Electrical system built-in test equipment (BITE); – Fuel management; Braking control; Steering control; – Landing gear extension and retraction; Tyre pressure indication; – Oleo pressure indication; – Brake temperature monitoring.	3	—	—	—	—	—	—
(b) Typical system layouts.	3	—	—	—	—	—	—
13.21 *Cabin systems* ***(ATA 44)*** System architecture, operation and control of systems for: — passenger in-flight entertainment; — communication within the aircraft (cabin intercommunication data system (CIDS); — communication between the aircraft cabin and ground stations, including voice, data, music and video transmission. CIDS interface between cockpit/cabin crew and cabin systems; Data exchange between the different related line replaceable units (LRUs); Flight attendant panels (FAPs). CNS server and interfaces with the following	3	—	—	—	—	—	—

MODULE 13— AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	LEVEL						
	B2	B2L Basic	B2L C/N	B2L Ins.	B2L A/F	B2L Sur.	B2L A/S
systems: Data/radio communication system; — Cabin core system (CCS); — In-flight entertainment system — (IFES); External communication system (ECS); Cabin mass memory — system (CMMS); Cabin monitoring — system (CMS); Miscellaneous cabin — systems (MCSs). The CNS may host functions such as: — access to predeparture/departure reports; — email/intranet/internet access; — passenger database.							
13.22 *Information systems* ***(ATA 46)*** The units and components which furnish a means of storing, updating, and retrieving digital information traditionally provided on paper, microfilm or microfiche. They include units that are dedicated to the information storage and retrieval function, such as the electronic library mass storage and controller, but they do not include units or components installed for other uses and shared with other systems, such as flight deck printer or general-use display. Typical examples include: — air traffic and information management systems and network — server systems; aircraft general information system; flight deck — information system; maintenance — information system; passenger — cabin information system; — miscellaneous information systems; — other linked systems.	3	—	—	—	—	—	—

MODULE 14 —PROPULSION	LEVEL B2 B2L Instruments B2L Airframe & Systems
14.1 *Engines* (a) Constructional arrangement and operation of turbojet, turbofan, turboshaft, and turboprop engines.	1
(b) Constructional arrangement and operation of auxiliary power units (APUs).	1
(c) Constructional arrangement and operation of piston engines.	1
(d) Constructional arrangement and operation of electric and hybrid engines, their electric energy storage and control systems.	2

MODULE 14 – PROPULSION	LEVEL B2 B2L Instruments B2L Airframe & Systems
(e) Electronic engine control and fuel-metering systems (full authority digital engine control (FADEC)).	2
14.2 *Electric/electronic engine indication systems* — Exhaust gas temperature / interstage turbine temperature — systems; Cylinder head temperature, engine coolant temperature, engine speed; — Engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems; — Vibration measurement systems; Oil pressure and — temperature; — Fuel pressure, temperature, and flow; — Manifold pressure; — Engine torque.	2
14.3 *Propeller systems* — Propeller speed indication; — Speed control and pitch change methods – electrical/electron — ic; Synchronising and synchrophasing equipment; — Electrical anti-icing/de-icing equipment.	2
14.4 *Starting and ignition systems* — Operation of engine start systems and components; — Ignition systems and components; — Maintenance safety requirements.	2

MODULE 15 GAS-TURBINE ENGINE

MODULE 15 – GAS-TURBINE ENGINE	LEVEL A1 A3	LEVEL B1.1 B1.3
15.1 *Fundamentals* — Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle; — The relationship between force, work, power, energy, velocity, and acceleration; Constructional arrangement and operation of turbojet, turbofan, — turboshaft, turboprop, and geared turbofan engines.	1	2
15.2 *Engine performance* — Gross thrust, net thrust, choked nozzle thrust, thrust distribution, resultant thrust, thrust horsepower, equivalent shaft horsepower, specific fuel — consumption; Engine efficiencies; — By-pass ratio and engine pressure ratio; — Pressure, temperature, and velocity of the gas flow; — Engine ratings, static thrust, influence of speed, altitude and hot climate, flat rating, limitations.	–	2
15.3 *Inlet* — Compressor inlet ducts; — Effects of various inlet — configurations; Ice protection.	2	2

MODULE 15 ~~-~~GAS-TURBINE ENGINE	LEVEL	
	A1 A3	B1.1 B1.3
15.4 *Compressors* — Axial and centrifugal types; — Constructional features, operating principles, and — applications; Fan balancing; — Operation: o Causes and effects of compressor stall and surge; o Methods of air-flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades; o Compressor ratio.	1	2
15.5 *Combustion section* Constructional features and principles of operation.	1	2
15.6 *Turbine section* — Operation and characteristics of different turbine blade — types; Blade-to-disk attachment; — Nozzle guide vanes; — Causes and effects of turbine blade stress and creep.	2	2
15.7 *Exhaust* — Constructional features and principles of — operation; Convergent, divergent, and variable — area nozzles; Engine noise reduction; — Thrust reversers.	1	2
15.8 *Bearings and seals* Constructional features and principles of operation.	—	2
15.9 *Lubricants and fuels* — Properties and specifications of standard, alternate, and drop-in — fuel; Properties and specifications of lubricants; — Fuel additives; — Safety precautions.	1	2
15.10 *Lubrication systems* System operation/layout and components.	1	2
15.11 *Fuel systems* — Operation of engine control and fuel-metering systems, including electronic engine control (full authority digital engine control (FADEC)) and electronic power augmentation; — System layout and components.	1	2
15.12 *Air systems* Operation of engine air distribution and anti-icing control systems, including internal cooling and sealing, and external air services.	1	2
15.13 *Starting and ignition systems* — Operation of engine start systems and — components; Ignition systems and components; — Maintenance safety requirements.	1	2

MODULE 15 ~~-~~GAS-TURBINE ENGINE	LEVEL	
	A1 A3	B1.1 B1.3
15.14 *Engine indication systems* — Exhaust gas temperature / interstage turbine temperature; — Engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems; — Oil pressure and temperature; Fuel — pressure and flow; Engine — speed; — Vibration measurement and indication; — Torque; — Power.	1	2
15.15 *Alternate turbine constructions* — Geared turbofan (GTF); Variable fan — blades; Open — rotor/propfan; — Hybrid turbine-electric concepts and electric power augmentation; — Future trends and developments.	—	1
15.16 *Turboprop engines* — Gas-coupled/free-turbine and gear-coupled — turbines; Reduction gears; — Integrated engine and propeller controls; — Overspeed safety devices.	1	2
15.17 *Turboshaft engines* Arrangements, drive systems, reduction gearing, couplings, control systems.	1	2
15.18 *Auxiliary power units (APUs)* Purpose, operation, protective systems.	1	2
15.19 *Power plant installation* Configuration of firewalls, cowlings, acoustic panels, engine mounts, antivibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.	1	2
15.20 *Fire protection systems* Operation of fire-detection and fire-extinguishing systems.	1	2
15.21 *Engine monitoring and ground operation* — Procedures for starting and ground run-up; Interpretation of engine power output and — parameters; — Trend (including oil analysis, vibration and borescope) monitoring; — Inspection of engine and components to criteria, tolerances and data specified by the engine manufacturer; — Compressor — washing/cleaning; Foreign object damage (FOD).	1	3

MODULE 15 –GAS-TURBINE ENGINE	LEVEL	
	A1 A3	B1.1 B1.3
15.22 *Engine storage and preservation* Preservation and depreservation for the engine and its accessories/systems.	—	2

MODULE 16 - PISTON ENGINE

MODULE 16 –PISTON ENGINE	LEVEL	
	A2 A 4	B1.2 B1.4 B3
16.1 *Fundamentals* — Mechanical, thermal, and volumetric efficiencies; — Operating principles: 2-stroke, 4-stroke, Otto, diesel, and rotary — (Wankel); Piston displacement and compression ratio; — Engine configuration and firing order.	1	2
16.2 *Engine performance* — Power calculation and measurement; — Factors that affect engine power; — Mixtures/leaning, pre-ignition.	1	2
16.3 *Engine construction* — Crank case, crank shaft, cam shafts, — sumps; Accessory gearbox; — Cylinder and piston assemblies; — Connecting rods, inlet and exhaust manifolds; — Valve mechanisms; — Propeller reduction gearboxes.	1	2
16.4 *Engine fuel systems*		
16.4.1 *Carburettors* — Types, construction, and principles of — operation; Icing and heating.	1	2
16.4.2 *Fuel injection systems* Types, construction, and principles of operation.	1	2
16.4.3 *Electronic engine control* — Operation of engine control and fuel-metering systems including electronic engine control (full authority digital engine control (FADEC)); — System layout and components.	1	2
16.5 *Starting and ignition systems* — Starting systems, preheat systems; — Magneto types, construction, and principles of operation; — Ignition harnesses, spark plugs; — Low- and high-tension systems.	1	2
16.6 *Induction, exhaust, and cooling systems* — Construction and operation of induction systems, including alternate air — systems; Exhaust systems, engine cooling systems air and liquid.	1	2

MODULE 16 – PISTON ENGINE	LEVEL	
	A2 A 4	B1.2 B1.4 B3
16.7 *Supercharging/turbocharging* — Principles and purpose of supercharging and its effects on engine parameters; — Construction and operation of supercharging/turbocharging systems; — System — terminology; — Control systems; System protection.	1	2
16.8 *Lubricants and fuels* — Properties and specifications of standard, alternate, and drop-in fuel; — Properties and specifications of lubricants; — Fuel additives; — Safety precautions.	1	2
16.9 *Lubrication systems* System operation/layout and components.	1	2
16.10 *Engine indication systems* — Engine speed; — Cylinder head temperature; — Coolant temperature; — Oil pressure and — temperature; Exhaust gas — temperature; Fuel — pressure and flow; Manifold pressure.	1	2
16.11 *Power plant installation* Configuration of firewalls, cowlings, acoustic panels, engine mounts, antivibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.	1	2
16.12 *Engine monitoring and ground operation* — Procedures for starting and ground run-up; Interpretation of engine power output and — parameters; — Inspection of engine and components: criteria, tolerances, and data specified by the engine manufacturer.	1	3
16.13 *Engine storage and preservation* Preservation and depreservation for the engine and its accessories/systems.	—	2
16.14 *Alternate piston-engine constructions* Hybrid piston electric concepts and electric power augmentation.	1	1

MODULE 17 - PROPELLER

MODULE 17 —PROPELLER	LEVEL	
	A1 A2	B1. 1 B1. 2 B3
17.1 *Fundamentals* — Blade element theory; — High/low blade angle, reverse angle, angle of attack, rotational speed; — Propeller slip; — Aerodynamic, centrifugal, and thrust forces; — Torque; — Relative airflow on blade angle of attack; — Vibration and resonance.	1	2
17.2 *Propeller construction* — Construction methods and materials used in wooden, composite and metal propellers; — Blade station, blade face, blade shank, blade back / thrust face and hub assembly; — Fixed pitch, controllable pitch, constant speeding propeller; — Propeller/spinner installation.	1	2
17.3 *Propeller pitch control* — Speed control and pitch change methods— mechanical and electrical/electronic; — Feathering and reverse pitch; — Overspeed protection.	1	2
17.4 *Propeller synchronising* Synchronising and synchrophasing equipment.	—	2
17.5 *Propeller ice protection* Fluid and electrical de-icing equipment.	1	2
17.6 *Propeller maintenance* — Static and dynamic balancing; — lade tracking; — Assessment of blade damage, erosion, corrosion, impact damage, — delamination; Propeller treatment/repair schemes; — Propeller engine running.	1	3
17.7 *Propeller storage and preservation* Propeller preservation and depreservation.	1	2

AMC1 Appendix I Basic Knowledge Requirements (except for category L licence) Section 3

Basic training methods

Training methods categorized as follows: ‘ instructor-center training’ , student-centered training’ , and blended training’ .

The actual training method and training tools should be adapted to suit the training subject and be chosen considering their intrinsic characteristics, such as but not limited to their efficiency and the pedagogical benefits of the training method/tool.

Basic training modules 7, 9, 11, 12, 13, 14, 15, 16 and 17 should not normally be taught solely through a student-centred method unless provisions are in place to verify the actual and progressive acquisition of knowledge, skills and attitude by the student.

Appendix II – Basic Examination Standard (except for Category L Licence)

1. General

1.1 All basic examinations shall be carried out using the multiple choice question as specified below. The incorrect alternatives shall seem equally plausible to any one ignorant of the subject. All of the alternatives shall be clearly related to the question and of similar vocabulary, grammatical construction and length. In numerical questions, the incorrect answers shall correspond to procedural errors such as corrections applied in the wrong sense or incorrect unit conversions: they shall not be mere random numbers.

1.2 Each multiple choice questions must have more than two alternative answers of which only one must be the correct answer and the candidate shall be alloweda time per module which is based upon a nominal average of 75 seconds per question.

1.3 The pass mark for each CAR-66 module and sub-module multiple choice part of the examination is 75%.

1.4 Penalty marking systems shall not be used to determine whether a candidate has passed.

1.5 A failed module may not be retaken for at least 30 days following the date of the failed module examination.

1.6 The maximum number of attempts for each examination is three in a 12-month period. The applicant shall provide in a written statement to the competent authority (DGCA), the number, and dates of attempts during the 12 months preceding the examination.

1.7 While it is accepted that the subject matter of the questions may be the same, the questions used as part of the MBT learning programme shall not be used in examinations

2. Number of Questions and Examination Duration for the CAR-66 Appendix I Modules

Module		Category	Multiple choice Questions	Time allowed (Minutes)
No.	Subject			
1	Mathematics	All Categories	**Not Applicable**	
2	Physics	All Categories	**Not Applicable**	
3	Electrical Fundamentals	A	20	**25**
		B1	52	**65**
		B2 and B2L	52	**65**
		B3	24	**30**

Module No.	Module Subject	Category	Multiple choice Questions	Time allowed (Minutes)
4	Electronic Fundamentals	A	Not Applicable	
		B1	20	**25**
		B2 and B2L	40	**50**
		B3	20	**25**
5	Digital Techniques/Electronic Instrument Systems	A	20	**25**
		B1	40	**50**
		B2 and B2L	72	**90**
		B3	20	**25**
6	Materials and Hardware	A	52	**65**
		B1	80	**100**
		B2 and B2L	60	**75**
		B3	80	**100**
7A	Maintenance Practices	A	76	**95**
		B1	80	**100**
		B2 and B2L	60	**75**
7B	Maintenance Practices	B3	80	**100**
8	Basic Aerodynamics	A	24	**30**
		B1	24	**30**
		B2 and B2L	24	**30**
		B3	24	**30**
9	Human factors	A	28	**35**
		B1	28	**35**
		B2 and B2L	28	**35**
		B3	28	**35**
		A	32	**40**

Module No.	Subject	Category	Multiple choice Questions	Time allowed (Minutes)
10	Aviation Legislation	B1	44	**55**
		B2 and B2L	44	**55**
		B3	44	**55**
11A	Turbine Aeroplane Aerodynamics, Structures andSystems	A	108	**135**
		B1	140	**175**
		B2	0	**0**
11B	Piston Aeroplane Aerodynamics, Structures andSystems	A	72	**90**
		B1	100	**125**
		B2	0	**0**
11C	Piston Aeroplane Aerodynamics, Structures andSystems	B3	60	**75**
12	Helicopter Aerodynamics, Structures and Systems	A	100	**125**
		B1	128	**160**
		B2	0	**0**
13	Aircraft Aerodynamics, Structures and Systems	A	0	**0**
		B1	0	**0**
		B2	188	**235**
14	Propulsion	A	0	**0**
		B1	0	**0**
		B2 and B2L	32	**40**
15	Gas Turbine Engine	A	60	**75**
		B1	92	**115**
		B2	0	**0**
16	Piston Engine	A	52	**65**
		B1	76	**95**
		B2	0	**0**

Module		Category	Multiple choice Questions	Time allowed (Minutes)
No.	Subject			
		B3	76	**95**
17A	Propeller	A	20	**25**
		B1	32	**40**
		B2	0	**0**
17B	Propeller	B3	32	40

Category B2L:

System rating	Number of multiple- choice questions	Time allowed (minutes)
Basic requirements (Submodules 13.1, 13.2, 13.5 and 13.9)	32	40
COM/NAV (Submodule 13.4(a))	24	30
INSTRUMENTS (Submodule 13.8)	20	25
AUTOFLIGHT (Submodules 13.3(a) and 13.7)	28	35
SURVEILLANCE (Submodule 13.4(b))	20	25
AIRFRAME SYSTEMS (Submodules 13.11 to 13.18)	52	65

MODULE 14 — PROPULSION

Category B2L: 32 multiple-choice questions and time allowed is 40 minutes.

NOTE: The B2L examination for module 14 is only applicable to the 'Instruments' and 'Airframe Systems' ratings.

AMC1 Appendix II – Basic Examnination standard (Except for Category L Licence

The tables below show the acceptable number of questions for the submodules. Justified deviations from these values are also acceptable, provided the sum of the questions complies with the total number of questions for a given module

MODULE 1 —MATHEMATICS	Nr of questions	
	A	B1 B2 B2L B3
Reserved		

MODULE 2 — PHYSICS	Nr of questions	
	A B3	B1 B2 B2L
Reserved		

MODULE 3 – ELECTRICAL FUNDAMENTALS	Nr of questions		
	A	B1 B2 B2L	B3
Total number for the module:	*20*	*52*	*24*
3.1 Electron theory	*2*	*2*	*2*
3.2 Static electricity and conduction	*3*	*3*	*2*
3.3 Electrical terminology	*3*	*2*	*2*
3.4 Generation of electricity	*3*	*2*	*2*
3.5 Sources of DC electricity	*3*	*3*	*3*
3.6 DC circuits	1	2	1
3.7 Resistance/resistor: *(a) Resistance;*	—	*3*	*1*
(b) Resistors.	—	*2*	—
3.8 Power	—	*3*	*1*
3.9 Capacitance/capacitor	—	*4*	*1*
3.10 Magnetism: *(a) Theory of magnetism;*	—	*3*	*1*
(b) Magnetomotive force.	—	*1*	*1*
3.11 Inductance/inductor	—	*4*	*1*
3.12 DC motor/generator theory	—	*3*	*1*
3.13 AC theory	*5*	*3*	*1*
3.14 Resistive (R), capacitive (C) and inductive (L) circuits	—	*3*	*1*
3.15 Transformers	—	*3*	*1*
3.16 Filters	—	*1*	—
3.17 AC generators	—	*3*	*1*

MODULE 3 – ELECTRICAL FUNDAMENTALS	Nr of questions		
	A	B1 B2 B2L	B3
3.18 AC motors	—	*2*	*1*

MODULE 4 — ELECTRONICS FUNDAMENTALS

MODULE 4 – ELECTRONICS FUNDAMENTALS	Nr of questions		
	A	B1 B3	B2 B2L
Total number for the module:		*20*	*40*
Semiconductors			
Diodes: *Description and characteristics;* *Operation and function.*	—	*8*	*8*
	—	—	*7*
4.1.2 Transistors: *Description and characteristics;* *Construction and operation.*	—	*4*	*4*
	—	—	*7*
4.1.3 Integrated circuits: *Basic description and operation;* *Description and operation.*	—	*3*	*2*
	—	—	*4*
4.2 Printed circuit boards	—	*2*	*3*
4.3 Servomechanisms: *Principles;* *Construction, operation, and use.*	—	*3*	*2*
	—	—	*3*

MODULE 5 DIGITAL TECHNIQUES / ELECTRONIC INSTRUMENT SYSTEMS

MODULE 5— DIGITAL TECHNIQUES / ELECTRONIC INSTRUMENT SYSTEMS	Nr of questions			
	A	B3	B1	B2 B2L
Total number for the module:	*20*	*20*	*40*	*72*
5.1 Electronic instrument systems	*4*	*4*	*4*	*4*
5.2 Numbering systems	—	—	*3*	*5*
5.3 Data conversion	—	—	*3*	*4*
5.4 Data buses	—	—	*3*	*5*
5.5 Logic circuits: (a) *Identification and applications;* (b) *Interpretation of logic diagrams.*	—	—	*3*	*4*
	—	—	—	*4*

MODULE 5— DIGITAL TECHNIQUES / ELECTRONIC INSTRUMENT SYSTEMS	Nr of questions			
	A	B3	B1	B2 B2L
5.6 Basic computer structure: (a) *Computer terminology and technology;* (b) *Computer operation.*	*6* —	*2* —	*4* —	*2* *6*
5.7 Microprocessors	—	—	—	*4*
5.8 Integrated circuits	—	—	—	*5*
5.9 Multiplexing	—	—	—	*4*
5.10 Fibre optics	—	—	*3*	*3*
5.11 Electronic displays	*2*	*2*	*2*	*4*
5.12 Electrostatic sensitive devices	6	6	4	5
5.13 Software management control	—	1	3	3
5.14 Electromagnetic environment	—	1	3	4
5.15 Typical electronic/digital aircraft systems	2	4	5	6

MODULE 6 - MATERIALS AND HARDWARE

MODULE 6 - MATERIALS AND HARDWARE	Nr of questions		
	A	B1 B3	B 2 B
Total number for the module:	*50*	*80*	***60***
6.1 Aircraft Materials- ferrous;			
Alloy steels used in aircraft;	*3*	*3*	***3***
Testing of ferrous materials;	—	*2*	***1***
Repair and inspection procedures.	—	*2*	***1***
6.2 Aircraft materials non-ferrous: *(a) Characteristics;*	*3*	*4*	*3*
Testing of non-ferrous materials;	—	*3*	*2*
Repair and inspection procedures.	—	*2*	*1*
6.3 Aircraft materials composite and non-metallic			
6.3.1 Composite and non-metallic other than wood and fabric: (a) *Characteristics;*	*2*	*4*	*3*
Detection of defects;	*2*	*4*	—
Repairs and inspection procedures.	—	*2*	*2*
6.3.2 Wooden structures	*3*	*4*	—
6.3.3 Fabric covering	—	*4*	—
6.4 Corrosion: *Chemical fundamentals;*	*3*	*3*	*3*
Types of corrosion.	*4*	*5*	*3*
6.5 Fasteners *6.5.1 Screw threads*	*4*	*4*	*3*

MODULE 6 - MATERIALS AND HARDWARE	Nr of questions		
	A	B1 B3	B 2 B
6.5.2 Bolts, studs, and screws	*6*	*6*	*5*
6.5.3 Locking devices	*2*	*2*	*2*
6.5.4 Aircraft rivets	*2*	*3*	*2*
6.6 Pipes and unions: Identification;	*1*	*1*	*1*
Standard unions.	*2*	*2*	*2*
6.7 Springs	—	*1*	*1*
6.8 Bearings	*2*	*4*	*3*
6.9 Transmissions	*3*	*4*	*4*
6.10 Control cables	*5*	*5*	*4*
6.11 Electrical cables and connectors	*5*	*6*	*11*

MODULE 7 MAINTENANCE PRACTICES

MODULE 7— MAINTENANCE PRACTICES	Nr of questions		
	A	B1 B3	B2 B2L
Total number for the module:	76	80	60
7.1 Safety precautions — aircraft and workshop	4	4	4
7.2 Workshop practices	4	4	4
7.3 Tools	6	6	6
7.4 (Reserved)	—	—	—
7.5 Engineering drawings, diagrams, and standards	6	6	6
7.6 Fits and clearances	5	5	5
7.7 Electrical wiring interconnection system (EWIS)	4	4	8
7.8 Riveting	4	3	—
7.9 Pipes and hoses	4	3	—
7.10 Springs	1	1	—
7.11 Bearings	4	3	—
7.12 Transmissions	3	3	—
7.13 Control cables	4	3	—
7.14 Material handling *7.14.1 Sheet metal*	—	2	—
7.14.2 Composite and non-metallic	—	2	—
7.14.3 Additive manufacturing	2	4	2

MODULE 7— MAINTENANCE PRACTICES	Nr of questions		
	A	B1 B3	B2 B2L
7.15 (Reserved)	—	—	—
7.16 Aircraft weight and balance:			
(a) Centre-of-gravity calculation;	—	2	2
(b) Aircraft weighing.	—	1	—
7.17 Aircraft handling and storage	7	5	6
7.18 Disassembly, inspection, repair, and assembly techniques:			
(a) Types of defects and visual inspection techniques;	2	2	2
(b) General repair methods structural repair manual;	—	2	—
(c) Non-destructive inspection techniques;	—	1	1
(d) Disassembly and reassembly techniques;	2	1	1
(e) Troubleshooting techniques.	—	1	1
7.19 Abnormal events:			
(a) Inspections following lightning strikes and HIRF penetration;	2	1	2
(b) Inspections following abnormal events such as heavy landing and flight through turbulence.	2	1	—
7.20 Maintenance procedures	6	6	6
7.21 Documentation and communication	4	4	4

MODULE 8 BASIC AERODYNAMICS

MODULE 8 BASIC AERODYNAMICS	Nr of questions	
	A B3	B1 B2 B2L
Total number for the module:	24	24
8.1 Physics of the atmosphere *International Standard Atmosphere (ISA), application to aerodynamics.*	2	2
8.2 Aerodynamics	9	9
8.3 Theory of flight	7	7
8.4 High-speed airflow	4	4
8.5 Flight stability and dynamics	2	2

MODULE 9 HUMAN FACTORS

MODULE 9 HUMAN FACTORS	Nr of questions
	ALL
Total number for the module:	28
9.1 General	3
9.2 Human performance and limitations	3
9.3 Social psychology	2

9.4 Factors that affect human performance	3
9.5 Physical environment	2
9.6 Tasks	2
9.7 Communication	3
9.8 Human error	4
9.9 Safety management	2
9.19 The 'Dirty Dozen' and risk mitigation	4

MODULE 10 AVIATION LEGISLATION

MODULE 10 AVIATION LEGISLATION	Nr of questions	
	A	B1 B2 B2L B3
Total number for the module:	32	44
10.1 Regulatory framework	5	5
10.2 Certifying staff — maintenance	7	7
10.3 Approved maintenance organisations	6	6
10.4 Independent certifying staff	-	4
10.5 Air operations	4	4
10.6 Certification of aircraft, parts, and appliances	1	4
10.7 Continuing airworthiness	6	7
10.8 Oversight principles in continuing airworthiness	2	3
10.9 Maintenance and certification with respect to aircraft other than aeroplanes and helicopters	—	3
10.10 Cybersecurity in aviation maintenance	1	1

MODULE 11 AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 11 AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	Nr of questions				
	A1	A2	B1.1	B1.2	B3
Total number for the module:	108	72	140	100	60
11.1 Theory of flight:					
(a) Aeroplane aerodynamics and flight controls;	2	2	2	2	2
(b) Aeroplane, other aerodynamic devices.	2	2	2	2	2
11.2 Airframe structures (*ATA 51):*					
(a) General concepts;	3	3	4	3	2
(b) Airworthiness requirements for structural strength;	3	3	3	3	1
(c) Construction methods.	1	1	3	2	1
11.3 Airframe structures — aeroplanes					
*11.3.1 Fuselage, doors, windows (*ATA 52/53/56*):*					

MODULE 11 AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	Nr of questions				
	A1	A2	B1.1	B1.2	B3
(a) Construction principles;	1	1	2	2	2
(b) Airborne towing devices;	1	1	1	1	1
(c) Doors.	1	1	1	1	-
11.3.2 Wings (*ATA 57*)	2	2	3	3	2
11.3.3 Stabilisers (*ATA 55*)	1	1	2	2	1
11.3.4 Flight control surfaces (ATA 55/57)	1	1	2	2	1
11.3.5 Nacelles/pylons (ATA 54)	1	1	2	2	1
11.4 Air conditioning and cabin pressurisation (ATA 21): (a) Pressurisation;	2	2	3	1	–
(b) Air supply;	3	–	3	–	–
(c) Air conditioning;	3	–	3	–	–
(d) Safety and warning devices;	2	1	2	2	–
(e) Heating and ventilation system.	–	1	–	2	1
11.5 Instruments / avionics systems *11.5.1 Instrument systems (ATA 31)*	2	2	4	4	3
11.5.2 Avionics systems Fundamentals of system layouts and operation of: – Autoflight (ATA 22); – Communications (ATA 23); – Navigation systems (ATA 34).	3	2	5	4	4
11.6 Electrical power (ATA 24)	4	3	5	5	4
11.7 Equipment and furnishings (ATA 25) (a) Emergency equipment;	4	2	4	3	2
(b) Cabin and cargo layout.	3	3	3	3	-
11.8 Fire protection (ATA 26) (a) Fire and smoke detection system and fire-extinguishing systems;	3	2	4	3	–
(b) Portable fire extinguisher.	1	1	1	1	1
11.9 Flight controls (ATA 27) (a) Primary and secondary flight controls;	3	2	4	4	3
(b) Actuation and protection;	3	–	3	–	–
(c) System operation;	3	–	3	–	–
(d) Balancing and rigging.	1	1	3	3	2
11.10 Fuel systems (ATA 28/47) (a) Systems layout;	2	2	3	3	2

MODULE 11 AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS	Nr of questions				
	A1	A2	B1.1	B1.2	B3
(b) Fuel handling;	2	2	2	2	1
(c) Indications and warnings;	1	1	2	2	1
(d) Special systems;	1	—	1	—	—
(e) Balancing.	2	—	2	—	—
11.11 Hydraulic power (ATA 29) (a) System description;	1	1	3	3	2
(b) System operation (1);	1	1	3	2	1
(c) System operation (2).	2	—	2	—	—
11.12 Ice and rain protection (ATA 30) (a) Principles;	1	1	2	2	1
(b) De-icing;	1	1	2	2	1
(c) Anti-icing;	1	—	2	—	—
(d) Wipers;	1	1	2	2	1
(e) Rain-repellent systems.	2	—	2	—	—
11.13 Landing gear (ATA 32) (a) Description;	3	3	4	3	1
(b) System operation	3	3	4	2	1
(c) Air ground sensing	1	—	1	—	—
(d) Tail protection.	1	1	1	1	1
11.14 Lights (ATA 33)	2	2	3	3	2
11.15 Oxygen (ATA 35)	3	3	4	4	3
11.16 Pneumatic/vacuum (ATA 36) (a) Systems;	3	3	3	3	2
(b) Pumps.	3	3	3	3	2
11.17 Water/waste (ATA 38) (a) Systems;	2	2	2	2	1
(b) Corrosion.	1	1	1	1	1
11.18 Onboard maintenance systems (ATA 45)	3	—	3	—	—
11.19 Integrated modular avionics (IMA) (ATA 42) (a) Overall system description and theory;	1	—	1	—	—
(b) Typical system layouts.	1	—	1	—	—
11.20 Cabin systems (ATA 44)	2	—	2	—	—
11.21 Information systems (ATA 46)	2	—	2	—	—

MODULE 12 HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

MODULE 12 HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	Nr of questions	
	A3 A4	B1.3 B1.4
Total number for the module:	100	128
12.1 Theory of flight rotary wing aerodynamics	*6*	*9*
12.2 Flight control systems (ATA 67)	*9*	*9*
12.3 Blade tracking and vibration analysis (ATA 18)	*6*	*9*
12.4 Transmission	*3*	*6*
12.5 Airframe structures (ATA 51) *(a) General concept;*	*5*	*6*
(b) Construction methods of the principal elements.	*5*	*7*
12.6 Air conditioning (ATA 21)	—	—
12.6.1 Air supply	*1*	*2*
12.6.2 Air conditioning	*3*	*5*
12.7 Instruments / avionics systems *12.7.1 Instrument systems (ATA 31)*	*6*	*9*
12.7.2 Avionics systems *Fundamentals of system layouts and operation of:* *Autoflight (ATA 22);* *Communications (ATA 23);* *Navigation systems (ATA 34).*	*5*	*7*
12.8 Electrical power (ATA 24)	*8*	*10*
12.9 Equipment and furnishings (ATA 25) *(a) Emergency equipment:* *Seats, harnesses, and belts;* *Lifting systems.*	*2*	*3*
(b) Emergency flotation systems: *Cabin layout, cargo retention;* *Equipment layout;* *Cabin furnishing installation.*	*3*	*3*
12.10 Fire protection (ATA 26) *(a) Fire and smoke detection systems and fire-extinguishing systems;*	*3*	*4*
(b) Portable fire extinguishers.	*1*	*1*
12.11 Fuel systems (ATA 28)	*7*	*8*
12.12 Hydraulic power (ATA 29)	*8*	*8*
12.13 Ice and rain protection (ATA 30)	*4*	*4*
12.14 Landing gear (ATA 32) *(a) System description and operation;*	*3*	*4*
(b) Sensors.	*3*	*3*
12.15 Lights (ATA 33)	*3*	*4*
12.16 (Reserved)		
12.17 Integrated modular avionics (IMA) (ATA 42) *(a) Overall system description and theory;*	*1*	*1*
(b) Typical system layouts.	*1*	*1*
12.18 Onboard maintenance systems (ATA 45) *Central maintenance computers;*	*2*	*3*

MODULE 12 HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	Nr of questions	
	A3 A4	B1.3 B1.4
Data-loading system; *Electronic library system.*		
12.19 Information systems (ATA 46)	*2*	*2*

MODULE 13 AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS

C/N: Communication and Navigation; Ins.: instruments; A/F: Autoflight; Sur.: Surveillance; A/S: Airframe and Systems

MODULE 13 AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	Nr of questions						
	B2	B2L Basic	B2L C/N	B2L Ins.	B2L A/F	B2L Sur.	B2L A/S
Total number for the module:	188	32	24	20	28	20	50
13.1 Theory of flight							
(a) Aeroplane aerodynamics and flight controls;	3	3	—	—	—	—	—
(b) Rotary wing aerodynamics.	1	1	—	—	—	—	—
13.2 Structures general concepts (ATA 51)							
(a) General concepts;	4	4	—	—	—	—	—
(b) Fundamentals of structural systems.	4	4	—	—	—	—	—
13.3 Autoflight (ATA 22)							
(a) Fundamentals of automatic flight control;	16	—	—	—	8	—	—
(b) Autothrottle systems and automatic landing systems.	8	—	—	—	8	—	—
13.4 Communication/navigation (ATA 23/34)							
(a) Fundamentals of communication and navigation systems;	24	—	24	—	—	—	—
(b) Fundamentals of aircraft surveillance systems.	3	—	—	—	—	20	—
13.5 Electrical power (ATA 24)	13	13	—	—	—	—	—
13.6 Equipment and furnishings (ATA 25)	5	—	—	—	—	—	—
13.7 *Flight controls*							
(a) Primary and secondary flight controls (ATA 27);	4	—	—	—	3	—	—
(b) Actuation and protection;	4	—	—	—	3	—	—
(c) System operation;	2	—	—	—	3	—	—
(d) Rotorcraft flight controls (ATA 67).	2	—	—	—	3	—	—
13.8 Instruments (ATA 31)	20	—	—	20	—	—	—
13.9 Lights (ATA 33)	7	7	—	—	—	—	—
13.10 Onboard maintenance systems (ATA 45)	5	–	–	–	–	–	–
13.11 Air conditioning and cabin pressurisation (ATA 21)							
(a) Pressurisation;	2	—	—	—	—	—	2
(b) Air supply;	2	—	—	—	—	—	2
	2	—	—	—	—	—	2

MODULE 13 AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS	Nr of questions						
	B2	B2L Basic	B2L C/N	B2L Ins.	B2L A/F	B2L Sur.	B2L A/S
(c) Air conditioning; (d) Safety and warning devices.	2	—	—	—	—	—	2
13.12 *Fire protection (ATA 26)* (a) Fire and smoke detection system and fire- extinguishing systems;	2	—	—	—	—	—	2
(b) Portable fire extinguisher.	1	—	—	—	—	—	1
13.13 *Fuel systems (ATA 28, ATA 47)* (a) System layout;	2	—	—	—	—	—	2
(b) Fuel handling;	2	—	—	—	—	—	2
(c) Indications and warnings;	2	—	—	—	—	—	2
(d) Special systems;	2	—	—	—	—	—	2
(e) Balancing.	1	—	—	—	—	—	1
13.14 Hydraulic power (ATA 29)							
(a) System layout;	1	—	—	—	—	—	1
(b) System operation (1);	5	—	—	—	—	—	4
(c) System operation (2).	5	—	—	—	—	—	4
13.15 Ice and rain protection (ATA 30) (a) Principles;	1	—	—	—	—	—	1
(b) De-icing;	2	—	—	—	—	—	2
(c) Anti-icing;	1	—	—	—	—	—	1
(d) Wiper systems;	1	—	—	—	—	—	1
(e) Rain repellent.	1	—	—	—	—	—	1
13.16 Landing gear (ATA 32) (a) Description;	1	—	—	—	—	—	1
(b) System;	3	—	—	—	—	—	3
(c) Air ground sensing.	3	—	—	—	—	—	3
13.17 Oxygen (ATA 35)	2	–	—	—	—	—	—
13.18 Pneumatic/vacuum (ATA 36)	6	–	—	—	—	—	6
13.19 Water/waste (ATA 38)	2	–	—	—	—	—	2
13.20 Integrated modular avionics (IMA) (ATA 42) (a) Overall system description and theory;	2	—	—	—	—	—	—
(b) Typical system layouts.	1	—	—	—	—	—	—
13.21 Cabin systems (ATA 44)	3	—	—	—	—	—	—
13.22 Information systems (ATA 46)	3	—	—	—	—	—	—

MODULE 14 PROPULSION

MODULE 14 –PROPULSION	Nr of questions
	B2 B2L Instruments B2L Airframe and Systems
Total number for the module:	32
14.1 Engines	
(a) Turbine engines;	3
(b) Auxiliary power units (APUs);	4
(c) Piston engines;	2
(d) Electric and hybrid engines;	4
(e) Engine control.	3
14.2 Electric/electronic engine indication systems	10
14.3 Propeller systems	2
14.4 Starting and ignition systems	4

MODULE 15 GAS-TURBINE ENGINE

MODULE 15 GAS-TURBINE ENGINE	Nr of questions	
	A1 A3	B1.1 B1.3
Total number for the module:	60	92
15.1 Fundamentals	*4*	*4*
15.2 Engine performance	—	*6*
15.3 Inlet	*3*	*4*
15.4 Compressors	*5*	*7*
15.5 Combustion section	*3*	*3*
15.6 Turbine section	*5*	*5*
15.7 Exhaust	*4*	*4*
15.8 Bearings and seals	—	*3*
15.9 Lubricants and fuels	*3*	*4*
15.10 Lubrication systems	*3*	*4*
15.11 Fuel systems	*4*	*5*
15.12 Air systems	*3*	*3*
15.13 Starting and ignition systems	*3*	*4*
15.14 Engine indication systems	*5*	*7*
15.15 Alternate turbine constructions	—	*2*
15.16 Turboprop engines	*3*	*5*
15.17 Turboshaft engines	*2*	*3*

MODULE 15 GAS-TURBINE ENGINE	Nr of questions	
	A1 A3	B1.1 B1.3
15.18 Auxiliary power units (APUs)	*2*	*3*
15.19 Power plant installation	*2*	*3*
15.20 Fire protection systems	*2*	*3*
15.21 Engine monitoring and ground operation	*4*	*7*
15.22 Engine storage and preservation	—	*3*

MODULE 16 PISTON ENGINE

MODULE 16 PISTON ENGINE	Nr of questions	
	A1 A3	B1.1 B1.3
Total number for the module:	52	76
16.1 Fundamentals of piston engines	*5*	*5*
16.2 Engine performance	*3*	*5*
16.3 Engine construction	*7*	*8*
16.4 Engine fuel systems	—	—
16.4.1 Carburettors	*3*	*4*
16.4.2 Fuel injection systems	*2*	*4*
16.4.3 Electronic engine control	*2*	*4*
16.5 Starting and ignition systems	*5*	*5*
16.6 Induction, exhaust, and cooling systems	*3*	*4*
16.7 Supercharging/turbocharging	*4*	*6*
16.8 Lubricants and fuels	*2*	*5*
16.9 Lubrication systems	*3*	*4*
16.10 Engine indication systems	*6*	*7*
16.11 Power plant installation	*3*	*3*
16.12 Engine monitoring and ground operation	*3*	*5*
16.13 Engine storage and preservation	—	*3*
16.14 Alternative piston-engine constructions	*1*	*4*

MODULE 17 PROPELLER

MODULE 17 –PROPELLER	Nr of questions	
	A1 A2	B1.1 B1.2 B3
Total number for the module:	20	32
17.1 Fundamentals of propellers	5	8
17.2 Propeller construction	4	5
17.3 Propeller pitch control	4	6
17.4 Propeller synchronising	—	2
17.5 Propeller ice protection	2	3
17.6 Propeller maintenance	3	6
17.7 Propeller storage and preservation	2	2

1. General

Aircraft type training shall consist of theoretical training and examination, and, except for the category C ratings, practical training and assessment.

a. Theoretical training and examination shall comply with the following requirements:

i) Shall be conducted by a maintenance training organisation appropriately approved in accordance with CAR-147 or, when conducted by other organisations, as directly approved by the DGCA.

ii) Shall comply, except as permitted by the differences training described in point (c), with:

- Shall comply with the standard set out in point 3.1 of this Appendix, and
- the type training examination standard described in point 4.1 of this Appendix.

iii) Reserved

iv) Shall have been started and completed within the 3 years preceding the application for a type rating endorsement.

b. Practical training and assessment shall comply with the following requirements:

(i) Shall be conducted by a maintenance training organisation appropriately approved in accordance with CAR- 147 or, when conducted by other organisations, as directly approved by the DGCA.

(ii) Shall comply, except as permitted by the differences training described in point (c), with:

- Shall comply with the standard set out in point 3.2 of this Appendix
- the type training assessment standard described in point 4.2 of this Appendix.

(iii) Shall include a representative cross section of maintenance activities relevant tothe aircraft type.

(iv) Shall include demonstrations using equipment, components, maintenance simulation training devices (MSTDs), maintenance training devices (MTDs), or real aircraft

(v) Shall have been started and completed within the 3 years preceding the application for a type rating endorsement.

c. Differences training

(i) Differences training is the training required in order to cover the differences between :

(a) two different aircraft type ratings of the same manufacturer as determined by the DGCA.

(b) two different licence categories in respect of the same aircraft type rating

(ii) Differences training has to be defined on a case-to-case basis taking into account the requirements contained in this Appendix III in respect of both theoretical and practical elements of type rating training

(iii) A type rating shall only be endorsed on a licence after differences training when the applicant also complies with one of the following conditions:

- having already endorsed on the licence the aircraft type rating from which the differences are being identified, or
- having completed the type training requirements for the aircraft from which the differences are being identified.

(iv) the differences training shall have been started and completed within 3 years preceding the application for the new type rating in the same category (case (a)) or in another category (case (b)).

2. Aircraft Type training levels

The three levels listed below define the objectives, the depth of training and level of knowledge that training is intended to achieve.

Level 1

A brief overview of the airframe, systems and powerplants as outlined in the Systems Description Section of the Aircraft Maintenance Manual / Instructions for Continued Airworthiness.

Course objectives: Upon completion of the course, the student will be able to:

a) provide a simple description of the whole subject, using common words and examples, using typical terms and identify safety precautions related to the airframe, its systems and powerplant;
b) identify aircraft manuals, maintenance practices important to the airframe, its systems and powerplant;
c) define the general layout of the aircraft's major systems;
d) define the general layout and characteristics of the powerplant;
e) identify special tooling and test equipment used with the aircraft

Level 2

Basic system overview of controls, indicators, principal components including their location and purpose, servicing and minor troubleshooting. General knowledge of the theoretical and practical aspects of the subject

Course objectives: In addition to the information contained in the Level 1, training, at the completion of this Level 2 , training the student will be able to:

(a) understand the theoretical fundamentals; apply knowledge in a practical manner using detailed procedures;

(b) recall the safety precautions to be observed when working on or near the aircraft, powerplant and systems;

(c) describe systems and aircraft handling particularly access, power availability and sources;

(d) identify the locations of the principal components;

(e) explain the normal functioning of each major system, including terminology and nomenclature;

(f) perform the procedures for servicing associated with the aircraft for the following systems: Fuel, Power Plants, Hydraulics, Landing Gear, Water/Waste, and Oxygen;

(g) demonstrate proficiency in use of crew reports and on-board reporting systems (minor troubleshooting) and determine aircraft airworthiness per the MEL/CDL;

(h) demonstrate the use, interpretation and application of appropriate documentation including instructions for continued airworthiness, maintenance manual, illustrated parts catalogue, etc.

Level 3

Detailed description, operation, component location, removal/installation and bite and troubleshooting procedures to maintenance manual level.

Course objectives: In addition to the information contained in Level 1 and Level 2 training, at the completion of Level III, the student will be able to:

(a) demonstrate a theoretical knowledge of aircraft systems and structures and interrelationships with other systems, provide a detailed description of the subject using theoretical fundamentals and specific examples and to interpret results from various sources and measurements and apply corrective action where appropriate;

(b) Perform system, power plant, component and functional checks as specified in the maintenance manual.

(c) demonstrate the use, interpret and apply appropriate documentation includingstructural repair manual, troubleshooting manual, etc.;

(d) Correlate information for the purpose of making decisions in respect of faultdiagnosis and rectification to maintenance manual level.

(e) Describe procedures for replacement of components unique to aircraft type.

3. Aircraft Type training standard

Although aircraft type training includes both theoretical and practical elements, courses can be approved for the theoretical element, the practical element or for a combination of both.

An appropriate training method, or combination of training methods, shall be determined for the entire course or for each of its parts with regard to the scope and objectives of each training phase and taking into consideration the benefits and limitations of the available training methods.

Multimedia-based training (MBT) methods may be used in order to achieve the training objectives

3.1Theoretical element

(a) Objective

On completion of a theoretical training course the student shall be able to demonstrate, to the levels identified in the Appendix III syllabus, the detailed theoretical knowledge of theaircraft's applicable systems, structure, operations, maintenance, repair, and troubleshooting according to approved maintenance data. The student shall be able to demonstrate the use of manuals and approved procedures, including the knowledge of relevant inspections and limitations.

(b) Level of training:

Training levels are those levels defined in point 2 above. During a level 3 theoretical training, level 1 and 2 training material may be used to teach the full scope ofthe chapter if required. However, during the training the majority of the course material and training time shall be at the higher level

(c) Duration:

The theoretical training minimum tuition hours are contained in the following table:

Category	Hours
Aeroplanes with a maximum take-off mass above 30 000 kg:	
B1.1	150
B1.2	120
B2	100
Level 1 General Familiarization	30
Aeroplanes with a maximum take-off mass equal or less than 30 000 kg and above 5 700 kg:	
B1.1	120
B1.2	100
B2	100
Level 1 General Familiarization	25
Aeroplanes with a maximum take-off mass of 5 700 kg and below(1)	
B1.1	80
B1.2	60
B2	60
Level 1 General Familiarization	15
Helicopters(2)	
B1.3	120
B1.4	100
B2	100
Level 1 General Familiarization	25
(1) For non-pressurised piston engine aeroplanes below 2 000 kg MTOM the minimum duration can be reduced by 50 %. (2) For helicopters in group 2 (as defined in point 66.A.05) the minimum duration can be reduced by 30 %.	

For the purpose of the table above, a tuition hour means 60 minutes of teaching and exclude any breaks, examination, revision, preparation and aircraft visit. These hours apply only to theoretical courses for complete aircraft/engine combinations according tothe type rating as defined by the DGCA.

(d) Justification of course duration:

Training courses carried out in a maintenance training organisation approved in accordance with CAR-147 and courses directly approved by the DGCA shall justify theirhour duration and the coverage of the full syllabus by a training needs analysis based on:

- the design of the aircraft type, its maintenance needs and the types of operation,
- detailed analysis of applicable chapters
- see contents table in point 3.1(e) below,
- detailed competency analysis showing that the objectives as stated in point 3.1(a) above are fully met.

Where the training needs analysis shows that more hours are needed, course lengths shallbe longer than the minimum specified in the table.

Similarly, tuition hours of differences courses or other training course combinations (suchas combined B1/B2 courses), and in cases of theoretical type training courses below thefigures given in point 3.1(c) above, these shall be justified to the DGCA by the training needs analysis as described above.

In addition, the course must describe and justify the following:

- The minimum attendance required to the trainee, in order to meet the objectives of thecourse.
- The maximum number of hours of training per day, taking into account pedagogicaland human factors principles.

If the minimum attendance required is not met, the certificate of recognition shall not beissued. Additional training may be provided by the training organisation in order to meetthe minimum attendance time.

(e) Content:

As a minimum, the elements in the Syllabus below that are specific to the aircraft type shallbe covered. Additional elements introduced due to type variations, technological changes, etc. shall also be included.

The training syllabus shall be focused on mechanical and electrical aspects for B1 personnel, and electrical and avionic aspects for B2.

If it exists, the minimum syllabus of the operational suitability data (OSD), established shall be included

Level Chapters	Aeroplanes Turbine		Aeroplane Piston		Helicopter turbine		Helicopter Piston		Avionics
	B1	Level 1	B1	Level 1	B1	Level 1	B1	Level 1	B2
Introduction module:									
05 Time limits/ maintenance checks	1	1	1	1	1	1	1	1	1
06 Dimensions/Areas (MTOM, etc.)	1	1	1	1	1	1	1	1	1
07 Lifting and Shoring	1	1	1	1	1	1	1	1	1
08 Levelling and weighing	1	1	1	1	1	1	1	1	1
09 Towing and taxiing	1	1	1	1	1	1	1	1	1

Level Chapters	Aeroplanes Turbine		Aeroplane Piston		Helicopter turbine		Helicopter Piston		Avionics
	B1	Level 1	B1	Level 1	B1	Level 1	B1	Level 1	B2
10 Parking/mooring, Storing and Return to Service	1	1	1	1	1	1	1	1	1
11 Placards and Markings	1	1	1	1	1	1	1	1	1
12 Servicing	1	1	1	1	1	1	1	1	1
20 Standard practices — only type particular	1	1	1	1	1	1	1	1	1
Helicopters									
18. Vibration and Noise Analysis(Blade tracking)	–	--	–	–	3	1	3	1	–
60 Standard Practices Rotor	-	-	-	-	3	1	3	1	-
62 Rotors	–	–	–	–	3	1	3	1	1
62A Rotors — Monitoring and indicating	–	–	–	–	3	1	3	1	3
63 Rotor Drives	--	--	--	--	3	1	3	1	1
63A Rotor Drives — Monitoring and indicating	--	--	--	--	3	1	3	1	3
64 Tail Rotor	–	–	–	–	3	1	3	1	1
64A Tail rotor — Monitoring and indicating	--	--	--	--	3	1	3	1	3
65 Tail Rotor Drive	--	–	–	–	3	1	3	1	1
65A Tail Rotor Drive — Monitoring and indicating	--	--	--	--	3	1	3	1	3
66 Folding Blades/Pylon	–	–	–	–	3	1	3	1	–
67 Rotors Flight Control	--	--	--	--	3	1	3	1	--
53 Airframe Structure (Helicopter)	--	--	--	--	3	1	3	1	--
25 Emergency Flotation Equipment	--	--	--	--	3	1	3	1	1
Airframe Structure									
51 Standard practices and structures (damage classification, assessment and repair)	3	1	3	1	–	–	–	–	1
53 Fuselage	3	1	3	1	–	–	–	–	1

Level Chapters	Aeroplanes Turbine		Aeroplane Piston		Helicopter turbine		Helicopter Piston		Avionics
	B1	Level 1	B1	Level 1	B1	Level 1	B1	Level 1	B2
54 Nacelles/Pylons	3	1	3	1	–	–	–	–	1
55 Stabilizers	3	1	3	1	–	–	–	–	1
56 Windows	3	1	3	1	–	–	–	–	1
57 Wings	3	1	3	1	–	–	–	–	1
27A Flight Control Surfaces (All)	3	1	3	1	–	–	–	–	1
52 Doors	3	1	3	1	–	–	–	–	1
Zonal & Station Identification Systems	1	1	1	1	1	1	1	1	1
Airframe Systems									
21 Air Conditioning	3	1	3	1	3	1	3	1	3
21A Air Supply	3	1	3	1	3	1	3	1	2
21B Pressurization	3	1	3	1	3	1	3	1	3
21C Safety & Warning Devices	3	1	3	1	3	1	3	1	3
22 Autoflights	2	1	2	1	2	1	2	1	3
23 Communication	2	1	2	1	2	1	2	1	3
24 Electrical Power	3	1	3	1	3	1	3	1	3
25 Equipment & Furnishings	3	1	3	1	3	1	3	1	1
25A Electronic Emergency Equip. & Cabin Entertainment Equipment	1	1	1	1	1	1	1	1	3
26 Fire Protection	3	1	3	1	3	1	3	1	3
27 Flight Controls	3	1	3	1	3	1	3	1	2
27A Sys. Operation: Electrical/Fly-by-Wire	3	1	–	–	–	–	–	–	3
28 Fuel Systems	3	1	3	1	3	1	3	1	2
28A Fuel Systems — Monitoring and indication	3	1	3	1	3	1	3	1	3

Level Chapters	Aeroplanes Turbine		Aeroplane Piston		Helicopter turbine		Helicopter Piston		Avionics
	B1	Level 1	B1	Level 1	B1	Level 1	B1	Level 1	B2
29 Hydraulic Power	3	1	3	1	3	1	3	1	2
29A Hydraulic Power — Monitoring and indicating	3	1	3	1	3	1	3	1	3
30 Ice & Rain Protection	3	1	3	1	3	1	3	1	3
31 Indicating/Recording Systems	3	1	3	1	3	1	3	1	3
31A Instrument Systems	3	1	3	1	3	1	3	1	3
32 Landing Gear	3	1	3	1	3	1	3	1	2
32A Landing Gear — Monitoring and indicating	3	1	3	1	3	1	3	1	3
33 Lights	3	1	3	1	3	1	3	1	3
34 Navigation	2	1	2	1	2	1	2	1	3
35 Oxygen	3	1	3	1	–	–	–	–	2
36 Pneumatic	3	1	3	1	3	1	3	1	2
36A Pneumatic — Monitoring and indicating	3	1	3	1	3	1	3	1	3
37 Vacuum	3	1	3	1	3	1	3	1	2
38 Water/Waste	3	1	3	1	--	--	--	--	2
41 Water Ballast	3	1	3	1	--	--	--	--	1
42 Integrated modular avionics	2	1	2	1	2	1	2	1	3
44 Cabin Systems	2	1	2	1	2	1	2	1	3
45 On-board Maintenance Systems	3	1	3	1	3	1	–	–	3
46 Information Systems	2	1	2	1	2	1	2	1	3
50 Cargo and Accessory Compartments	3	1	3	1	3	1	3	1	1
55/57 Flight control surfaces (All)	3	1	3	1	–	–	–	–	1
Turbine Engines:									
70 Standard Practices — Engines,	3	1	–	–	3	1	–	–	1

Level Chapters	Aeroplanes Turbine		Aeroplane Piston		Helicopter turbine		Helicopter Piston		Avionics
	B1	Level 1	B1	Level 1	B1	Level 1	B1	Level 1	B2
70A constructional arrangement and operation (Installation Inlet, Compressors, CombustionSection, Turbine Section, Bearings and Seals, Lubrication Systems).	3	1	--	--	3	1	--	--	1
70B Engine Performance	3	1	–	–	3	1	–	–	1
71 Powerplant	3	1	–	–	3	1	–	–	1
72 Engine Turbine/Turbo Prop/Ducted Fan/Unducted fan	3	1	--	--	3	1	--	--	1
73 Engine Fuel and Control	3	1	–	–	3	1	–	–	1
75 Air	3	1	–	–	3	1	–	–	1
76 Engine controls	3	1	–	–	3	1	–	–	1
78 Exhaust	3	1	–	–	3	1	–	–	1
79 Oil	3	1	–	–	3	1	–	–	1
80 Starting	3	1	–	–	3	1	–	–	1
82 water injection	3	1	–	–	3	1	–	–	1
83 Accessory Gear Boxes	3	1	–	–	3	1	–	–	1
84 Propulsion Augmentation	3	1	–	–	3	1	–	–	1
73A	3	1	–	–	3	1	–	–	3
74 Ignition	3	1	–	–	3	1	–	–	3
77 Engine Indicating Systems	3	1	–	–	3	1	–	–	3
49 Auxiliary Power Units (APUs)	3	1	–	–	--	--	–	–	2
Piston Engines:									
70 Standard Practices — Engines	--	--	3	1	–	–	3	1	1
70A Constructional arrangement and operation (Installation, Carburettors, Fuel injection	–	–	3	1			3	1	1

Level Chapters	Aeroplanes Turbine		Aeroplane Piston		Helicopter turbine		Helicopter Piston		Avionics
	B1	Level 1	B1	Level 1	B1	Level 1	B1	Level 1	B2
systems, Induction, Exhaust and Cooling Systems, Supercharging/ Turbocharging, Lubrication Systems).					--	--			
70B Engine Performance	_	_	3	1	--	--	3	1	1
71 Powerplant	–	–	3	1	–	–	3	1	1
73 Engine Fuel and Control	–	–	3	1	–	–	3	1	1
76 Engine Control	–	–	3	1	–	–	3	1	1
79 Oil	–	–	3	1	–	–	3	1	1
80 Starting	–	–	3	1	–	–	3	1	1
81 Turbine	--	--	3	1	--	--	3	1	1
82 Water Injections	–	–	3	1	–	–	3	1	1
83 Accessory Gear Boxes	–	–	3	1	–	–	3	1	1
84 Propulsion Augmentation	–	–	3	1	–	–	3	1	1
73A FADEC	–	–	3	1	–	–	3	1	3
74 Ignition	–	–	3	1	–	–	3	1	3
77 Engine Indication Systems	–	–	3	1	–	–	3	1	3
Propellers:									
60A Standard Practices — Propeller	3	1	3	1	–	–	–	–	1
61 Propellers/Propulsion	3	1	3	1	–	–	–	–	1
61A Propeller Construction	3	1	3	1	--	--	--	--	1
61B Propeller Pitch Control	3	1	3	1	–	–	–	–	–
61C Propeller Synchronizing	3	1	3	1	–	–	–	–	1
61D Propeller Electronic control	2	1	2	1	–	–	–	–	3
61E Propeller Ice Protection	3	1	3	1	–	–	–	–	–

Level Chapters	Aeroplanes Turbine		Aeroplane Piston		Helicopter turbine		Helicopter Piston		Avionics
	B1	Level 1	B1	Level 1	B1	Level 1	B1	Level 1	B2
61F Propeller Maintenance	3	1	3	1	–	–	–	–	1

(f) Multimedia Based Training (MBT) methods may be used to satisfy the theoretical training element either in the classroom or in a virtual controlled environment subject tothe acceptance of the DGCA approving the training course.

3.2 Practical element

a) Objective:

The objective of practical training is to gain the required competence in performing safe maintenance, inspections and routine work according to the maintenance manual and other relevant instructions and tasks as appropriate for the type of aircraft, for exampletroubleshooting, repairs, adjustments, replacements, rigging and functional checks. It includes the awareness of the use of all technical literature and documentation for the aircraft, the use of specialist/special tooling and test equipment for performing removaland replacement of components and modules unique to type, including any on-wing maintenance activity.

b) Content:

At least 50 % of the crossed items in the table below, which are relevant to the particularaircraft type, shall be completed as part of the practical training.

Tasks crossed represent subjects that are important for practical training purposes to ensure that the operation, function, installation and safety significance of key maintenance tasks is adequately addressed; particularly where these cannot be fully explained by theoretical training alone. Although the list details the minimum practical trainingsubjects, other items may be added where applicable to the particular aircraft type.

Tasks to be completed shall be representative of the aircraft and systems both incomplexity and in the technical input required to complete that task. While relatively simple tasks may be included, other more complex tasks shall also be incorporated andundertaken as appropriate to the aircraft type.

If it exists, the minimum list of practical tasks of the operational suitability data (OSD), established shall be part of the practical elements to be selected

Glossary of table: LOC: Location; FOT: Functional / Operation Test; SGH: Service and Ground; Handling; R/I: Removal / Installation; MEL: Minimum Equipment List; TS: Trouble Shooting

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
Introduction module:											
05 Time limits/maintenance checks	X/X	--	--	--	--	--	--	--	--	--	-
06 Dimensions/Areas (MTOM, etc.)	X/X	--	--	--	--	--	--	--	--	--	-
07 Lifting and Shoring	X/X	--	--	--	--	--	--	--	--	--	-
08 Levelling and weighing	X/X	--	X	--	--	--	--	X	--	--	-
09 Towing and Taxing	X/X	--	X	--	--	--	--	X	--	--	-
10 Parking/Mooring storing and return to service	X/X	--	X	--	--	--	--	X	--	--	-

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
11 Placard and marking	X/X	--	--	--	--	--	--	--	--	--	-
12 Servicing	X/X	--	X	--	--	--	--	X	--	--	-
20 Standard practices –only type particular	X/X	--	X	--	--	--	--	X	--	--	-
Helicopters:											
18 Vibration and Noise Analysis (Blade tracking)	X/--	--	--	--	--	X	--	--	--	--	-
60 Standard Practices Rotor — only type specific	X/X	--	X	--	--	--	--	X	--	--	-
62 Rotors	X/--	--	X	X	--	X	--	--	--	--	-
62A Rotors — Monitoring and indicating	X/X	X	X	X	X	X	--	--	X	--	x
63 Rotor Drives	X/--	X	--	--	--	X	--	--	--	--	-
63A Rotor Drives — Monitoring andindicating	X/X	X	--	X	X	X	--	--	X	--	X
64 Tail Rotor	X/--	--	X	--	--	X	--	--	--	--	-
64A Tail rotor -Monitoring and indicating	X/X	X	--	X	X	X	--	--	X	--	X
65 Tail Rotor Drive	X/--	X	--	--	--	X	--	--	--	--	-
65A Tail Rotor Drive — Monitoring and indicating	X/X	X	--	X	X	X	--	--	X	--	X
66 Folding Blades/Pylon	X/--	X	X	--	--	X	--	--	--	--	-
67 Rotors Flight Control	X/--	X	X	--	X	X	--	--	--	--	-
53 Airframe Structure (Helicopter) Note:covered under Airframe structures											
25 Emergency Flotation Equipment	X/X	X	X	X	X	X	X	X	--	--	-
Airframe structures:											
51 Standard Practices and Structures (damage classification, assessment and repair											
53 Fuselage	X/--	--	--	--	--	X	--	--	--	--	-
54 Nacelles/Pylons	X/--	--	--	--	--	--	--	--	--	--	-
55 Stabilisers	X/--	--	--	--	--	--	--	--	--	--	-
56 Windows	X/--	--	--	--	--	X	--	--	--	--	-
57 Wings	X/--	--	--	--	--	--	--	--	--	--	-

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
27A Flight Control Surfaces	X/--	--	--	--	--	X	--	--	--	--	-
52 Doors	X/X	X	X	--	--	--	--	X	--	--	-
Airframe systems:											
21 Air Conditioning	X/X	X	X	--	X	X	X	X	--	X	X
21A Air Supply	X/X	X	--	--	--	--	X	--	--	--	-
21B Pressurisation	X/X	X	--	--	X	X	X	--	--	X	X
21C Safety and warning Devices	X/X	--	X	--	--	--	--	X	--	--	-
22 Autoflight	X/X	--	--	--	X	--	X	X	X	X	X
23 Communications	X/X	--	X	--	X	--	X	X	X	X	X
24 Electrical Power	X/X	X	X	X	X	X	X	X	X	X	X
25 Equipment and Furnishings	X/X	X	X	X	--	--	X	X	X	--	-
25A Electronic Equipment including emergency equipment	X/X	X	X	X	--	--	X	X	X	--	-
26 Fire Protection	X/X	X	X	X	X	X	X	X	X	X	X
27 Flight Controls	X/X	X	X	X	X	X	X	--	--	--	-
27A Sys. Operation: Electrical/Fly-by-Wire	X/X	X	X	X	X	--	X	--	X	--	X
28 Fuel Systems	X/X	X	X	X	X	X	X	X	--	X	-
28A Fuel Systems — Monitoring and indicating	X/X	X	--	--	--	--	X	--	X	--	X
29 Hydraulic Power	X/X	X	X	X	X	X	X	X	--	X	-
29A Hydraulic Power — Monitoring and indicating	X/X	X	--	X	X	X	X	--	X	X	X
30 Ice and Rain Protection	X/X	X	X	--	X	X	X	X	--	X	X
31 Indicating/Recording Systems X	X/X	X	X	X	X	X	X	X	X	X	X
31A Instrument Systems	X/X	X	X	X	X	X	X	X	X	X	X
32 Landing Gear	X/X	X	X	X	X	X	X	X	X	X	-
32A Landing Gear — Monitoring and indicating	X/X	X	--	X	X	X	X	--	X	X	X

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
33 Lights	X/X	X	X	--	X	--	X	X	X	X	-
34 Navigation	X/X	--	X	--	X	--	X	X	X	X	X
35 Oxygen	X/--	X	X	X	--	--	X	X	--	--	-
36 Pneumatic	X/--	X	--	X	X	X	X	--	X	X	X
36A Pneumatic — Monitoring and indicating	X/X	X	X	X	X	X	X	X	X	X	X
37 Vacuum	X/--	X	--	X	X	X	--	--	--	--	-
38 Water/Waste	X/--	X	X	--	--	--	X	X	--	--	-
41 Water Ballast	X/--	--	--	--	--	--	--	--	--	--	-
42 Integrated modular avionics	X/X	--	--	--	--	--	X	X	X	X	X
44 Cabin Systems	X/X	--	--	--	--	--	X	X	X	X	X
45 On-Board Maintenance System (orcovered in 31)	X/X	X	X	X	X	X	X	X	X	X	X
46 Information Systems	X/X	--	--	--	--	--	X	--	X	X	X
50 Cargo and Accessory Compartments	X/X	--	X	--	--	--	--	--	--	--	-
55/57 Flight control surfaces	X/--	--	--	--	--	X	--	--	-	--	-
Turbine/Piston Engine Module:											
70 Standard Practices — Engines only type particular	---	--	X	--	--	--	--	X	--	--	-
70A Constructional arrangement andoperation(Installation Inlet, Compressors, Combustion Section, Turbine Section, Bearings and Seals,Lubrication Systems)	X/X	--	--	--	--	--	--	--	--	-	-
Turbine engines:											
70B Engine Performance	--	--	--	--	--	X	--	--	--	--	-
71 Power Plant	X/--	X	X	--	--	--	--	X	--	--	-
72 Engine Turbine/Turboprop /Ducted Fan/ Unducted fan	X/--	--	--	--	--	--	--	--	--	--	-
73 Engine Fuel and Control	X/X	X	--	--	--	--	--	--	--	--	-
73A FADEC Systems	X/X	X	--	X	X	X	X	--	X	X	X
74 Ignition	X/X	X	--	--	--	--	X	--	--	--	-
75 Air	X/--	--	--	X	--	X	--	--	--	--	-

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
76 Engine Controls	X/--	X	--	--	--	X	--	--	--	--	-
77 Engine Indicating	X/X	X	--	--	X	X	X	--	--	X	X
78 Exhaust	X/--	X	--	--	X	--	--	--	--	--	-
79 Oil	X/--	--	X	X	--	--	--	--	--	--	-
80 Starting	X/--	X	--	--	X	X	--	--	--	--	-
82 Water Injection	X/--	X	--	--	--	--	--	--	--	--	-
83 Accessory Gearboxes	X/--	--	X	--	--	--	--	--	--	--	-
84 Propulsion Augmentation	X/--	X	--	--	--	--	--	--	--	--	-
Auxiliary Power Units (APUs):											
49 Auxiliary Power Units (APUs)	X/--	X	X	--	--	X	--	--	--	--	-
Piston Engines:											
70 Standard Practices — Engines — type particular only	--	--	X	--	--	--	--	X	--	--	-
70A Constructional arrangement and operation (Installation Inlet, Compressors, Combustion Section, Turbine Section, Bearings and Seals, Lubrication Systems)	X/X	--	--	--	--	--	--	--	--	-	-
70B Engine Performance	--	--	--	--	--	X	--	--	--	--	-
71 Power Plant	X/--	X	X	--	--	--	--	X	--	--	-
73 Engine Fuel and Control	X/X	X	--	--	--	--	--	--	--	--	-
73A FADEC Systems	X/X	X	--	X	X	X	X	X	X	X	X
74 Ignition	X/X	X	--	--	--	--	X	--	--	--	-
76 Engine Controls	X/--	X	--	--	--	X	--	--	--	--	-
77 Engine Indicating	X/X	X	--	--	X	X	X	--	--	X	X
78 Exhaust	X/--	X	--	--	X	X	--	--	--	--	-
79 Oil	X/--	--	X	X	--	--	--	--	--	--	-
80 Starting	X/--	X	--	--	X	X	--	--	--	--	-
81 Turbines	X/--	X	X	X	--	X	--	--	--	--	-
82 Water Injection	X/--	X	--	--	--	--	--	--	--	--	-

Chapters	B1/B2	B1					B2				
	LOC	FOT	SGH	R/I	MEL	TS	FOT	SGH	R/I	MEL	TS
83 Accessory Gearboxes	X/--	--	X	X	--	--	--	--	--	--	-
84 Propulsion Augmentation	X/--	X	--	--	--	--	--	--	--	--	-
Propellers:											
60A Standard Practices — Propeller	--	--	--	X	--	--	--	--	--	--	-
61 Propellers/Propulsion	X/X	X	X	--	X	X	--	--	--	--	-
61A Propeller Construction	X/--	--	X	--	--	--	--	--	--	--	-
61B Propeller Pitch Control	X/--	X	--	X	X	X	--	--	--	--	-
61C Propeller Synchronising	X/--	X	--	--	--	X	--	--	--	X	-
61D Propeller Electronic control	X/X	X	X	X	X	X	X	X	X	X	X
61E Propeller Ice Protection	X/--	X	--	X	X	X	--	--	--	--	-
61F Propeller Maintenance	X/X	X	X	X	X	X	X	X	X	X	X

4. Type training examination and assessment standard

4.1. Theoretical element examination standard

After the theoretical portion of the aircraft type training has been completed, a writtenexamination shall be performed, which shall comply with the following:

(a) Format of the examination is of the multi-choice type. Each multi-choice question shallhave 3 alternative answers of which only one shall be the correct answer. The total time is based on the total number of questions and the time for answering is based upon a nominal average of 90 seconds per question.

(b) The incorrect alternatives shall seem equally plausible to anyone ignorant of the subject. All the alternatives shall be clearly related to the question and of similar vocabulary, grammatical construction and length.

(c) In numerical questions, the incorrect answers shall correspond to procedural errorssuch as the use of incorrect sense (+ versus -) or incorrect measurement units. Theyshall not be mere random numbers.

(d) The level of examination for each chapter (1) shall be the one defined in point 2 'Aircraft type training levels'. However, the use of a limited number of questions at a lower level is acceptable.

(e) The examination shall be of the closed book type. No reference material is permitted. An exception will be made for the case of examining a B1 or B2 candidate's ability tointerpret technical documents.

(f) The number of questions shall be at least 1 question per hour of instruction. The number of questions for each chapter and level shall be proportionate to:

— the effective training hours spent teaching at that chapter and level,

— the learning objectives as given by the training needs analysis.

DGCA shall assess the number and the level of the questions when approving the course.

(g) The minimum examination pass mark is 75 %. When the type training examination is split in several examinations, each examination shall be passed with at least a 75 %mark. In order to be possible to achieve exactly a 75 % pass mark, the number of questions in the examination shall be a multiple of 4.

(h) Penalty marking (negative points for failed questions) is not to be used.

(i) End of module phase examinations cannot be used as part of the final examination unless they contain the correct number and level of questions required.

(j) Whilst it is accepted that the subject matter of the questions may be the same, the questions used as part of the MBT learning programme shall not be used in course or phase examinations.

4.2. Practical element assessment standard.

After the practical element of the aircraft type training has been completed, anassessment must be performed, which must comply with the following:

(a) The assessment shall be performed by practical assessors appropriately qualified.

(b) The assessment shall evaluate the knowledge and skills of the trainee.

5. Type examination and skill test standard for Group 2 and Group 3 aircraft

Type examination shall be conducted by training organisations appropriately approved under CAR-147 or by DGCA.

The skill test shall consist of oral examination followed by practical assessment and comply with the following requirements

(a) The oral examination shall be on a sample of chapters drawn from point 3. 'Aircraft type training standard', at the indicated level in point 3.1.(e)

(b) The practical assessment shall determine the candidate's competence to perform maintenance tasks applicable to the particular aircraft type

(c) Both oral examinations and practical assessments shall ensure that the following objectives are met:

1. properly discuss with confidence the aircraft type and its systems;
2. ensure safe performance of maintenance, inspections, and routine work according to the maintenance manual and other relevant instructions and tasks as appropriate for the type of aircraft, for example, troubleshooting, repairs, adjustments, replacements, rigging and functional checks such as engine run, etc., if required;
3. correctly use all technical literature and documentation for the aircraft;
4. correctly use specialist/special tooling and test equipment, perform removal and replacement of components and modules unique to type, including any on-wing maintenance activity

(d) The following conditions apply to the examination:

1. The maximum number of attempts for each examination is three in a 12-month period. A waiting period of 30 days is required after each failed attempt within one set

2. The applicant shall confirm in writing to the DGCA the number, and dates of attempts during the last 12-month period DGCA Office where these attempts took place. DGCA is responsible for checking the number of attempts within the applicable timeframes.

3. The type examination and skill test shall be passed and the required practical experience shall be completed within the 3 years preceding the application for the rating endorsement on the aircraft maintenance licence.

6. On the Job Training

6.1 General

The OJT is the training that the applicant is given on a particular aircraft type in a real workplace, having the possibility to learn maintenance best practices and correct release-to-service procedures. The OJT shall comply with the following requirements:

(a)The list of the OJT tasks and programme shall be accepted by the DGCA before starting the OJT training.

(b) The OJT shall be conducted at one or more maintenance organisations appropriately approved according to the CAR 145 or CAR-CAO for the maintenance of that aircraft type. One of those organisations shall control the OJT.

(c)The applicant shall have a category A, B or L5 licence before undergoing the OJT or have finished the theoretical type training and cumulated at least 50 % of the basic experience requirement (point 66.A.30) as regards the category of aircraft he or she is trained for.

(d)The applicant shall start and complete the OJT within 3 years preceding the application for the first type rating endorsement. At least 50 % of the OJT tasks shall take place after the related aircraft theoretical type training has been completed.

(e)The applicant shall undergo the OJT under the mentorship of a qualified mentor or mentors, on a one-to-one supervision basis, during which the mentors verify the technical knowledge, the skills, and responsibilities of a typical certifying staff. During the OJT, the mentors transmit also knowledge and experience to the applicant, providing the necessary advice, support, and guidance.

(f)Each task shall be signed off by the applicant and refer to an actual job card/work sheet, etc. The mentors shall verify and countersign off the tasks performed during the OJT, because they shall assume the responsibility for the tasks at support staff or certifying staff level, as applicable, depending on the release-to-service procedure.

(g)At the satisfactory completion of the OJT programme, the mentors shall issue a recommendation for the final assessment of the applicant to be conducted by designated assessors.

6.2 OJT content and OJT logbook

The OJT shall include a series of activities and tasks representative of the aircraft type rating, systems, and licence category applied for and may cover more than one licence category. The OJT shall be documented in an OJT logbook reporting the following:

(a) name of the applicant;

(b) date of birth of the applicant;

(c) the approved maintenance organisation(s) where the OJT was carried out;

(d) aircraft rating and licence categories applied for;

(e) list of tasks, including:

i. task description;

ii. reference to job card/work order/aircraft tech log, etc.;

iii. location of task completion;

iv. date of task completion;

v. aircraft type and aircraft registration(s).

(f) names of the mentors (including licence number, if applicable);

(g) Trainee Signature

(h) Mentor's signature and stamp

(i) a signed recommendation of the mentors for the successive final assessment of the applicant.

6.3 Final assessment of the applicant

The final assessment of the applicant may only be performed once the OJT logbook has been completed and the mentors have signed the related recommendation.

The designated assessor(s) conducting the final assessment shall notify the date of the assessment to DGCA well in advance to allow a possible participation of the DGCA RAO/SRAO.

The objective of the final assessment is to verify that the applicant has sufficient technical knowledge as well as the appropriate skills and attitude and that he or she is competent to work independently as type-rated certifying staff on a particular aircraft type.

The final assessment shall have a minimum duration of one working day.

(a)The assessment shall sample:

i.the general technical knowledge required for the particular licence category;

ii.the aircraft-type-specific knowledge and skills for the particular licence category;

iii.the understanding of the licence privileges relevant to the aircraft and to the licence category;

iv.the appropriate behaviour and safety attitude of the applicant in relation to the maintenance environment.

(b)The assessment shall be recorded in a report containing the following information:

i.identification data of the applicant;

ii.identification data of the assessor(s);

iii.date and time frame of the assessment;

iv.content of the assessment;

v.result of the assessment: Passed or Failed.

vi.signature of the assessor(s), the candidate and, if applicable, the independent observer(s).

(c)A failed assessment may be retaken after 3 months or, if additional training has been received and a new recommendation by the mentors has been made, earlier than 3 months if agreed by the assessor(s). After three failed attempts, the complete OJT shall be repeated.

Note :When designated assessor is not approved or authorized by DGCA for the assessment , DGCA may conduct the OJT assessment

6.4 Requirements for mentors and assessors

Mentors and assessors are maintenance staff with the following qualifications:

i. Mentors:

- hold a valid aircraft maintenance engineer's AME licence (AMEL) issued in accordance with CAR- 66 by DGCA
- have been holding, for at least 1 year, an AME Licence L in the same category, when compared to the one for which the OJT is being mentored, that is endorsed with a type rating appropriate to exercise the privileges on the related aircraft;
- have the necessary release or sign-off privileges in the maintenance organization where the OJT is performed;
- have experience in training other people (such as being apprenticeship instructors, instructors in accordance with CAR147, having received train-the trainer courses or having any other comparable qualification, or having a training to do so that is acceptable to DGCA

ii. Assessors of the final assessment:

- hold a valid AME Licence (AMEL) issued in accordance with CAR 66 Rule 61 of the Aircraft Rule 1937 , by DGCA;
- have been holding, for at least 3 years, an AME L in the same category, when compared to the one for which the OJT is being assessed, endorsed with the same or similar aircraft type rating;
- have experience and/or have received training in assessing others (such as being apprenticeship instructors, examiners in accordance with CAR-147, having received train-the-trainer courses, or having any other comparable qualification, or having a training to do so that is acceptable to the DGCA);
- shall not have been involved as a mentor of the applicant in the OJT; when the assessor has taken part in the OJT performance, then an independent observer shall be present during the OJT assessment.

6.5 OJT documentation and records

The satisfactory accomplishment of the OJT shall be attested to the applicant with the final assessment report and the OJT logbook.

The OJT documentation shall be provided to DGCA to support the application for the issue or change of the licence.

Records of the OJT documentation shall be kept by the maintenance organisation where the OJT is conducted, in accordance with the procedures agreed with the DGCA

AMC to Appendix III to CAR-66

Aircraft type training and On-the-Job Training

The theoretical and practical training providers, as well as the OJT provider, may contractthe services of a language translator in the case where training is imparted to students not conversant in the language of the training material. Nevertheless, it remains essential that the students understand all the relevant maintenance documentation. During the performance of examinations and assessments, the assistance of the translator should be limited to the translation of the questions, but should not provide clarifications or help in relation to those questions.

AMC to Section 1 of Appendix III to CAR-66

Aircraft type training

1. Aircraft type training may be subdivided in airframe and/or power plant and/oravionics/electrical systems type training courses
   i. Airframe type training course means a type training course including all relevant aircraft structure and electrical and mechanical systems excluding thepower plant.
   ii. Power plant type training course means a type training course on the bare engine, including the build-up to a quick engine change unit.
   iii. The interface of the engine/airframe systems should be addressed by either airframe or power plant type training course. In some cases, such as for generalaviation, it may be more appropriate to cover the interface during the airframe course due to the large variety of aircraft that can have the same engine typeinstalled.
   iv. Avionics/electrical systems type training course means type training on avionics and electrical systems covered by but not necessarily limited to ATA (Air Transport Association) Chapters 22, 23, 24, 25, 27, 31, 33, 34, 42, 44, 45, 46, 73 and 77 or equivalent.
2. Practical training may be performed either following or integrated with the theoretical elements. However, it should not be performed before theoretical training.
3. The content of the theoretical and practical training should:
   i. address the different parts of the aircraft which are representative of the structure, the systems/components installed and the cabin; and

ii. include training on the use of technical manuals, maintenance procedures and the interface with the operation of the aircraft.

iii. Therefore, it should be based on the following elements:

a. Type design including relevant type design variants, new technology and techniques;

b. Feedback from in-service difficulties, occurrence reporting, etc.;

c. Significant applicable airworthiness directives and service bulletins;

d. Known human factor issues associated with the particular aircraft type;

e. Use of common and specific documentation, (when applicable, such as MMEL, AMM, MPD, TSM, SRM, WD, AFM, tool handbook), philosophy of the troubleshooting, etc.;

f. Knowledge of the maintenance on-board reporting systems and ETOPS maintenance conditions, when applicable;

g. Use of special tooling and test equipment and specific maintenance practices including critical safety items and safety precautions;

h. Significant and critical tasks/aspects from the MMEL, CDL, Fuel Tank Safety (FTS), airworthiness limitation items (ALI) including Critical Design Configuration Control Limitations (CDCCL), CMR and all ICA documentation such as MRB, MPD, SRM, AMM, etc., when applicable.

i. Maintenance actions and procedures to be followed as a consequence of specific certification requirements, such as, but not limited to, RVSM (Reduced Vertical Separation Minimum) and NVIS (Night Vision Imaging Systems);

j. Knowledge of relevant inspections and limitations as applicable to the effects of environmental factors or operational procedures such as cold and hot climates, wind, moisture, sand, de-icing/anti-icing, etc.

The type training does not necessarily need to include all possible customer options,corresponding to the type rating described in the Appendix I to AMC to CAR-66.

4. Limited avionic system training should be included in the category B1 type training as the B1 privileges include work on avionics systems requiring simple tests to provetheir serviceability.

5. Electrical systems should be included in both categories of B1 and B2 type training.

6. The theoretical and practical training should be complementary and may be:

i. Integrated or split;

ii. Supported by the use of training aids, such as, trainers, virtual aircraft, aircraft components, maintenance simulation training devices (MSTDs) and maintenance training devices (MTDs).

7. The integration and usage of MSTDs and MTDs, in maintenance type training (theoretical and/or practical) should consider the following:

i. The use of actual aircraft components should be allowed for any MSTD or MTD, even if the components are in a non-airworthy condition.

ii. The complexity and degree of simulation for an MSTD may vary and should support type training elements that address a component, a system or the entire aircraft. Based on its characteristics and capabilities, the MSTD may be:

a. a training device capable of providing, for the respective component or system, the representation of aircraft location, access and layout, and for servicing with an acceptable

level of accuracy and limited simulation; or

b. a training device capable of providing, for the respective component or system, the representation of aircraft location, access and layout with sufficient accuracy and with interactive simulation for servicing, and the applicable maintenance data for operational (O) and functional (F) test elements including built-in test (BIT) initiation and monitoring from outside the cockpit; such representation should have the capability to accommodate some troubleshooting scenarios; or

c. a training device capable of providing, for the respective component or system, the representation of onboard (flight deck/cockpit or cabin) indication and controls with an acceptable level of accuracy and limited interactive simulation; or

d. a training device capable of providing, for the respective component or system, the representation of onboard (flight deck/cockpit or cabin) indication and controls with sufficient accuracy and with interactive simulation for servicing, and the applicable maintenance data for operational (O) and functional (F) test elements including built-in test (BIT) initiation and monitoring; such representation should have the capability to accommodate some troubleshooting scenarios; or

e. any combination of the above.

iii. Flight simulation training devices (FSTDs) may be used as MSTDs whenever their characteristics and capabilities are considered appropriate for, and supportive of, the delivery of the respective maintenance training element(s).

iv. An MTD is any training device other than an MSTD used for maintenance training and/or examination and/or assessment.

AMC to Paragraphs 1(b), 3.2 and 4.2 of Appendix III to CAR-66 "Aircraft TypeTraining and Examination Standard. On-the-Job Training"

Practical element of the aircraft type training

1. The practical training may include instruction in a classroom or in simulators but partof the practical training should be conducted in a real maintenance or manufacturer environment.
2. The tasks should be selected because of their frequency, complexity, variety, safety, criticality, novelty, etc. The selected tasks should cover all the chapters described inthe table contained in paragraph 3.2 of Appendix III to CAR-66.
3. The duration of the practical training should ensure that the content of training required by paragraph 3.2 of Appendix III to CAR-66 is completed.

   Nevertheless, for aeroplanes with a MTOM equal or above 30 000 kg, the duration for the practical element of a type rating training course should not be less than two weeks, unless a shorter duration meeting the objectives of the training and taking into account pedagogical aspects (maximum duration per day) is justified to the DGCA.
4. The organisation providing the practical element of the type training should provide trainees with a schedule or plan indicating the list of tasks to be performed under instruction or supervision. A record of the tasks completed should be entered into a logbook which should be designed such that each task or group of tasks may be countersigned by the practical assessor. The logbook format and its use should be clearly defined.

5. In paragraph 4.2 of Appendix III to CAR-66, the term practical assessors appropriately qualified" means that the assessors should demonstrate training and experience on the assessment process being undertaken and be authorised to do so by the organisation.

Further guidance about the assessment and the practical assessors is provided inAppendix III to AMC to CAR-66.

6. The practical element (for power plant and avionic systems) of the Type Rating Training may be subcontracted by the approved CAR-147 organisation under its quality system according to the provisions of 147.A.145 (d) 3 and the correspondingGuidance Material.

AMC to Paragraph 1(c) of Appendix III to CAR-66 "Aircraft Type Training and Examination Standard. On-the-Job Training"

Differences training

Approved difference training is not required for different variants within the same aircraft type rating (as specified in Appendix I to AMC to CAR-66) for the purpose of typerating endorsement on the aircraft maintenance licence.

However, this does not necessarily mean that no training is required before a certifying staff authorization can be issued by the maintenance organisation (refer to AMC 66.A.20(b) 3).

For this purpose the procedure to conduct difference training for different variants within the same aircraft type rating shall be defined in the MTOE/MOE.

GM1 Appendix III Aircraft type training and type skill test standard on-the-job training (OJT) Section 1(c)

If the holder of a B1 and B2 licence, without any type rating, successfully completes a combined type training course (B1 + B2) followed by an OJT tailored only to B1 tasks, they can obtain only the type rating endorsement that is applicable to the B1 subcategory.

Within the next 3 years from the completion of the combined training course, endorsement of the aircraft type for the B2 category is possible after carrying out an OJT programme limited to the tasks relevant to the B2 category only.

When instead, the aircraft type endorsement would be requested after more than 3 years, the applicant would be required to also pass a differences type training course (from B1 to B2) plus the OJT programme limited to the tasks relevant to the B2 category only. All common theoretical and practical elements, and OJT tasks, already demonstrated as B1, shall be considered fulfilled.

AMC1 Appendix III Aircraft type training and type evaluation skill test standard on-the-job training (OJT) Section 3

Training methods are categorized as 'instructor – centered ', student – centered , and 'blended training'

The actual training method and the training tools should be adapted to suit the training subject and be chosen considering their intrinsic characteristics, such as but not limited to their efficiency and the pedagogical benefits of the method/tool.

A complex or critical subject should not normally be taught solely through a student-centered method unless provisions are in place to verify the actual and progressive acquisition of knowledge of the student.
Complex and critical areas should be identified by the training needs analysis (TNA). The

complexity and criticality of the areas could differ on a case-by-case basis (that is, areas proven to be critical by organizations' 'in-service events' , occurrence reporting , human factors , safety etc.) but should be in any case cover the maintenance areas with special emphasis (MASE) identified by the type-certificate holder (TCH) in its operational suitability data (OSD).

AMC to point 3.1(d) of Appendix III to CAR-66 "Aircraft Type Training and Examination Standard. On-the-Job Training"

Training Needs Analysis for the theoretical element of the aircraft type training

1. The minimum duration for the theoretical element of the type rating training course, as described in Appendix III to CAR-66, has been determined based on:
   i. generic categories of aircraft and minimum standard equipment fit;
   ii. the estimated average duration of standard courses imparted.
2. The purpose of the Training Needs Analysis (TNA) is to adapt and justify the duration of the course for a specific aircraft type. This means that the TNA is the main driver for determining the duration of the course, regardless of whether it is above or below the minimum duration described in Appendix III to CAR-66.

   In the particular case of type training courses approved on the basis of the requirements valid before this CAR is applicable and having a duration for the theoretical element equal to or above the minimum duration contained in paragraph 3.1(c) of Appendix III to CAR-66, it is acceptable that the TNA only covers the differences introduced by this CAR in paragraph 3.1(e) "Content" and the criteria introduced in paragraph 3.1(d) "Justification of course duration" related to the minimum attendance and the maximum number of training hours per day. This TNA may result in a change in the duration of the theoretical element.
3. The content and the duration deriving from the TNA may be supported by an analysis from the Type Certificate holder.
4. In order to approve a reduction of such minimum duration, the evaluation done by the DGCA should be performed on a case-by-case basis appropriate to the aircraft type. For example,
   i. while it would be exceptional for a theoretical course for a large transport category aircraft such as an A330 or B757 to be below the minimum duration shown, it would not necessarily be exceptional in the case of a General Aviation (GA) business aircraft such as a Learjet 45 or similar. Typically, the TNA for a GA aircraft course would demonstrate that a course of a shorter duration satisfies the requirements.
   ii. The use of an MSTD (i.e. flat panel trainer) comprising aircraft-type-specific software may result in the duration of the training being reduced due to a more effective transfer of knowledge.
   iii. The use of multimedia-based training (MBT), or blending the training methods, may improve the efficiency of the training and, consequently, contribute to the reduction of the overall time needed to achieve the learning objectives.
5. When developing the TNA, the following should be considered:

a) The TNA should include an analysis identifying all the areas and elements where there is a need for training as well as the associated learning objectives, considering the design philosophy of the aircraft type, the operational environment, the type of operations and the operational

experience. This analysis should be written in a manner which provides a reasonable understanding of which areas and elements constitute the course to meet the learning objectives.

b) As a minimum, the Training Need Analysis (TNA) should take into account all theapplicable elements contained in paragraph 3.1 of CAR-66 Appendix III and associated AMCs.

c) The TNA should set up the course content considering the Appendix III objectives foreach level of training and the prescribed topics in the theoretical element table contained in paragraph 3.1 of CAR-66 Appendix III.

d) For each Chapter described in the theoretical element table contained in paragraph

3.1 of CAR-66 Appendix III, the corresponding training time should be recorded

e) Typical documents to be used to identify the areas and elements where there is a needfor training typically include, among others, the Aircraft Maintenance Manual, MRB report, CMRs, airworthiness limitations, Troubleshooting Manual, Structural Repair Manual, Illustrated Parts Catalogue, Airworthiness Directives and Service Bulletins.

f) During the analysis of these documents:

i) Consideration should be given to the following typical activities:

1. Activation/reactivation;
2. Removal/installation;
3. Testing;
4. Servicing;
5. Inspection, check and repairs;
6. Troubleshooting/diagnosis

ii) For the purpose of identifying the specific elements constituting the trainingcourse, it is acceptable to use a filtering method based on criteria such as:

1. Frequency of the task;
2. Human factor issues associated to the task;
3. Difficulty of the task;
4. Criticality and safety impact of the task;
5. In-service experience;
6. Novel or unusual design features (not covered by CAR-66 Appendix I);
7. Similarities with other aircraft types;
8. Special tests and tools/equipment.

iii) It is acceptable to follow an approach based on:

1. Tasks or groups of tasks; or
2. Systems or subsystems or components.

g) The TNA should:

i. Identify the learning objectives for each task, group of tasks, system, subsystem or component;

ii. Associate the identified tasks to be trained to the regulatory requirements(table in paragraph

3.1 of Appendix III to CAR-66);

iii. Organise the training into modules in a logical sequence (adequate combinationof chapters as defined in Appendix III of CAR-66);

iv. Determine the sequence of learning (within a lesson and for the wholesyllabus);

v. Identify the scope of information and level of detail with regard to the minimumstandard to which the topics of the TNA should be taught according to the set- up objectives.

vi. Address the following:

1. Description of each system/component including the structure (whereapplicable);
2. System/component operation taking into account:

a. Complexity of the system (e.g. the need of further breakdown into subsystems, etc.);

b. Design specifics which may require more detailed presentation or maycontribute to maintenance errors;

c. Normal and emergency functioning;

d. Troubleshooting;

e. Interpretation of indicators and malfunctions.

f. Use of maintenance publications;

g. Identification of special tools and equipment required for servicing andmaintaining the aircraft;

h. Maintenance Practices;

i. Routine inspections, functional or operational tests, rigging/adjustment,etc.

vii. Describe the following:

1. The instructional methods and equipment, teaching methods and blending ofthe teaching methods to ensure the effectiveness of the training;
2. The maintenance training documentation/material to be delivered to thestudent; Facilitated discussions, questioning session, additional practice- oriented training, etc.;
3. The homework, if developed i.e. to support the achievement of the learning objectives while using asynchronous distance-learning or self-learning methods.
4. The training provider's resources available to the learner.

h) It is acceptable to differentiate between issues which have to be led by an instructor and issues which may be delivered through interactive simulation training devices and/or covered by web-based elements. Overall time of the course will be allocated accordingly.

i) The maximum number of training hours per day for the theoretical element of type training should not be more than 6 hours. A training hour means 60 minutes of tuitionexcluding any breaks, examination, revision, preparation and aircraft visit. In exceptional cases, DGCA may allow deviation from this standard when it isproperly justified that the proposed number of hours follows pedagogical and humanfactors principles. These principles are especially important in those cases where:

i. Theoretical and practical training are performed at the same time;

ii. Training and normal maintenance duty/apprenticeship are performed at thesame time.

j) The minimum participation time for the trainee to meet the objectives of the course should not be less than 90 % of the tuition hours of the theoretical training course. Additional training may be provided by the training organisation in order to meet theminimum participation time. If the minimum participation defined for the course is not met, a certificate of recognition should not be issued.

k) The TNA is a living process and should be reviewed/updated based on operation feedback, maintenance occurrences, Airworthiness Directives, major service bulletins impacting maintenance activities or requiring new competencies formechanics, alert service bulletins, feedback from trainees or customer satisfaction,evolution of the maintenance documentation such as MRBs, MPDs, MMs, etc. The frequency at which the TNA should be reviewed/updated is left to the discretion ofthe organisation conducting the course.

NOTE: The examination is not part of the TNA. However, it should be prepared inaccordance with the learning objectives described in the TNA.

AMC1 Appendix III Aircraft type training and Skill Test standard on-the-job training (OJT) Section 4.1

Type training examination and assessment standard

1.1 Theoretical element examination standard Examinations may be computer or paper based, or a combination of both

AMC to Section 5 of Appendix III to CAR-66

Type Examination Standard

This Section 5 "Type Examination Standard" does not apply to the examination performed as part of type training. This Section only applies to those cases where type examination is performed as a substitute for type training.

AMC to Section 6 of Appendix III to CAR-66

On-the-Job Training (OJT)

General

*"*A maintenance organisation appropriately approved for the maintenance of the particular aircraft type" means a CAR-145 or M.A. Subpart F or CAR-CAO approved maintenance organisation holding an A rating for such aircraft.

The procedures for OJT of approved maintenance organisation should be included into the approved maintenance organization exposition (Chapter 3.20, as indicated in AMC 145.A.70 (a))

These procedures in the Exposition Manual are approved by DGCA, and providing training is not one of the privileges of a maintenance organisation, they can only be used when the licencing authority is DGCA. In other cases, it is up to the licencing authority to decide whether it accepts such procedures for the purpose of approving the OJT .

'Skills and responsibilities of a typical certifying staff' included but are not limited to :

- understanding the importance of professional integrity, behaviour and having an appropriate attitude towards safety;
- understanding the conditions for ensuring the continuing airworthiness of aircraft and components;
- the ability to identify and rectify existing and potential unsafe conditions;
- the ability to prioritise tasks, coordinate with a team, and report discrepancies;
- the ability to determine the required qualifications for the performance of maintenance tasks;
- the ability to confirm the proper accomplishment of maintenance tasks;
- the ability to compile and control completed work cards;
- knowledge of safety risks linked to a particular working environment;
- understanding of human performance and limitations;
- understanding of the AMO's (where the OJT is performed) privileges and limitations
- understanding of the AMO's personnel authorization and limitations;
- being familiar with AMO's documents/forms (work packages , work order, work card etc);
- being familiar with AMO's release – to – service procedures: use of aircraft technical logbook (ATLB), deferral of items and dispatch under MEL/CDL
- access, use and control of the required tools and equipment;
- access, use and control of the required ICAs (AMM, TSM, SRM, etc.).

OJT content and OJT logbook

If the aircraft manufacturer has defined the OJT tasks during the type certification of a particular aircraft type (e.g. the operational suitability data (OSD) has been approved for a particular aircraft type), those tasks should be selected. In particular, the analysis performed for the maintenance areas of specific emphasis (MASE), helps the organisation identify the more appropriate tasks.

Where no such data exists, the task list in Appendix II to the AMC to CAR 66 this CAR serves as the basis to develop an OJT programme including the applicable tasks for a particular aircraft type, based typically on the AMM. The tasks may be selected from the table in Appendix II in order to cover a broader representative sample of both simple and complex tasks on the particular aircraft type in order to reach a balanced distribution of the tasks between line and base maintenance. The tasks should be selected among those that are applicable to the aircraft type and the licence (sub)category applied for; for example, the selection could exclude location tasks (LOC) and tasks that can be considered under the category A licence privileges (seat covers, boilers, wheels, etc.).

A minimum number of tasks, as described in point 2 'List of Task for OJT' Appendix II, of each of the following categories should be performed: INS/inspections, FOT/functional or operational, SGH/servicing, R/I removal and installation, MEL, and T/S troubleshooting. DGCA may accept that a limited number of tasks is not performed as long as the relevant cross section of the tasks as regards quality, quantity and complexity is still assured.

A task may be performed on the analogous system installed on a different aircraft type when the systems are similar in terms of design architecture, technology, and functionality. This can be the case, for example, for tasks performed on engines or landing gear of aircraft of the same manufacturer. Such task

should be clearly identified and recorded.

Certain maintenance tasks could be performed on non-airworthy aircraft that still maintain functionality of systems to the extent that the maintenance tasks can be completely performed without any deviation from the maintenance instructions. Tasks circumscribed to system components may be performed at the workshop. This can be the case, for example, for avionics functional tests. Such scenarios should be limited to specific tasks that may not occur often in the maintenance of operational aircraft

The use of MSTDs and MTDs for OJT should be restricted to a minimum.

When an existing licence is changed to include an additional category with a type rating, a different OJT from the category held to the new one may be permissible. In those cases, only tasks corresponding to the differences between the two categories should be performed.
The organisation that has control over the OJT should provide candidates with a schedule or plan which indicates the list of tasks to be performed under supervision. A record of the completed tasks is to be entered into a logbook whose design and format should be such that each task or group of tasks is countersigned by the corresponding mentor(s).

Regarding day-to-day supervision of the OJT programme in the approved maintenance organization and the role of the mentor(s), the following should be considered:

- It is sufficient for the completion of the individual OJT tasks to be confirmed by the direct mentor(s), without the direct evaluation of the assessor being necessary
- During the day-to-day OJT performance, the aim of the supervision is for mentors to oversee the whole process, including task completion, use of manuals, adherence to procedures, observance of safety measures, warnings, cautions and recommendations, and demonstration of appropriate behaviour in the maintenance environment.
- The mentor(s) should personally observe the work being performed to ensure its safe completion, and should be readily available for consultation if needed during the OJT.
- The mentor(s) should sign the tasks and release the maintenance tasks as the candidate is still not qualified to do so.
- The mentor(s) should be designated by the approved maintenance organisation to supervise.

For training in release-to-service procedures, following the completion of the performance of a specific task chosen by the mentor, the candidate should prepare a document with simulated release to service which has to be marked as ‘for training purposes only’ (eg. Aircraft technical logbook page , maintenance task card, CRS). f both the task and the simulated release to service have been performed to the satisfaction of the mentor, the task may be countersigned in the OJT task list by the mentor. A physical or electronic copy of the document with simulated release should be added to the syllabus.

Tasks which are usually performed with more than one person may be performed by more than one candidate under the supervision of one mentor. During the performance of the tasks, the mentor is limited to overseeing three candidates at the same time, given that the candidates can be properly
Seen ‘at a glance’ from the mentor’s position. Those tasks should be marked as ‘group task ’ when applying applying for the approval. All other tasks should be a one-to-one mentorship. In such cases, all

the candidates involved should be noted on the work order.

At the end of the performance of the OJT, a compliance report shall be made which verifies and documents the correct and complete performance and the recommendation of the mentor(s) for the following assessment. The mentor(s) may deny a recommendation if the candidate has not demonstrated the knowledge, skills, behaviour and/or ethics required from certifying staff.

Final assessment of the applicant
The OJT assessment should consist of a theoretical part and a practical part.

The theoretical part comprises the regulatory framework, safety procedures, knowledge of aircraft and its systems, maintenance procedures, and other typical certifying staff activities such as:

- the review and acceptance of work orders;
- shift-handover procedures and team coordination;
- communication and interaction with the flight crew;
- dispatch with unserviceable items;
- clear aircraft logbook entries and reporting notes;
- checks before release to service.

The practical part should include maintenance tasks on the aircraft (e.g. rem./inst., TS, R/I, FOT, MEL dispatch). The assessor may decide to simulate some aspects of the maintenance tasks.

The aircraft type on which the OJT is performed needs to be available for the assessment together with access to the required maintenance data, equipment, and tools. A training aircraft may be acceptable. It is good practice to assess the practical skills on the aircraft in question while the assessment of knowledge may be performed either on the aircraft or in theory.

Further guidance about the designated assessors is provided in the AMC to Appendix III to CAR-66 and CAP 2100
the term “designated assessor appropriately qualified” means that the assessor should demonstrate training and experience on the assessment process being undertaken and should be authorized as per CAP 2100

If an independent observer is required for the OJT, they shall be selected by the maintenance organisation among the maintenance personnel that have not taken part in the OJT performance but do have an adequate understanding of the OJT procedures.

Appendix IV - Experience requirements for extending a CAR-66 Aircraft Maintenance Engineer's Licence

The table A below shows the experience requirements , in months, for adding a new category or subcategory to an existing CAR-66 licence.

The experience shall be practical maintenance experience on an operating aircraft in the group/subgroup of the subcategory relevant to the application.

The experience is to be signed by the signed off by Base In-charge/ SIC and this procedure is to be reflected in MOE

The experience requirements can be reduced by 50 % if the applicant has completed an approved CAR 147 (basic) basic training course relevant to a particular subcategory..

TABLE A

To: / From:	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2	B2L	B3	L1	L2	L3	L4	L5
A1	–	6	6	6	24	6	24	12	24	12	6	12	12	12	12	24
A2	6	–	6	6	24	6	24	12	24	12	6	12	12	12	12	24
A3	6	6	–	6	24	6	24	12	24	12	6	12	12	12	12	24
A4	6	6	6	–	24	6	24	12	24	12	6	12	12	12	12	24
B1.1	–	6	6	6	–	6	6	6	12	12	6	6	6	12	12	12
B1.2	6	–	6	6	24	–	24	6	24	12	–	–	–	12	12	12
B1.3	6	6	–	6	6	6	–	6	12	12	6	6	6	12	12	12
B1.4	6	6	6	–	24	6	24	–	24	12	6	6	6	12	12	12
B2	6	6	6	6	12	12	12	12	–	–	12	6	6	12	12	24
B2L	6	6	6	6	12	12	12	12	12	–	12	6	6	12	12	24
B3	6	—	6	6	24	6	24	12	24	12	—	—	—	12	12	12
L1	24	24	24	24	24	36	24	36	24	36	24	–	6(*)	12(*)	12(*)	24(*)
L2	24	12	24	24	36	12	36	24	36	24	12	–	–	12(*)	12(*)	24(*)
L3	30	30	30	30	30	48	30	48	30	48	30	12(*)	12(*)	–	6(*)	24(*)
L4	30	30	30	30	30	48	30	48	30	48	30	12(*)	12(*)	–	–	24(*)
L5	24	24	24	24	36	24	36	24	36	24	24	12(*)	12(*)	12(*)	–	–

Note :) Experience may be reduced by 50 % but allowing a licence with limitations, i.e. a licence endorsed with the exclusion of 'complex maintenance tasks provided for in Appendix VII to CAR -M), standard changes provided for in point 21.A.90B of CAR 21 , and standard repairs provided for in point 21.A.431B of CAR 21

B. Basic knowledge modules or partial modules required

The purpose of this table is to outline the examinations required to add a new basic category/subcategory to an AMEL granted in accordance with this Annex.

The syllabi prepared in accordance with Appendix I and Appendix VII require different levels of knowledge for different licence categories within a module; therefore, there are additional examinations applicable to certain modules for licence holders wishing to extend an AME Licence AMEL granted in accordance with this CAR to include another category/subcategory and an analysis of the module shall be conducted to determine the subjects missing or passed at a lower level.

To From	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2	B2L	B3	L1C	L1	L2C	L2	L3H	L3G	L4H	L4G	L5
A1	None	16.	12.	12, 16.	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.	All except 2, 8, 9.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 9.
A2	11, 15.	None	12, 15.	12.	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.	All except 2, 8, 9.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 9.
A3	11, 17.	11, 16, 17.	None	16.	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.	All except 2, 8, 9.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 9.
A4	11, 15, 17.	11, 17.	15.	None	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.	All except 9.	All except 2, 8, 9.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 2L.	All except 9.
B1.1	None	16.	12.	12, 16.	None	16.	12.	12, 16.	4, 5, 13,14	4, 5, 13SQ, 14SQ	16.	12L.	12L.	8L**, 12L.	8L**, 12L.	9L.	10L.	9L, 11L.	10L, 11L.	8L**, 10L, 11,12L.
B1.2	11,15.	None	12, 15.	12.	11, 15.	None	12, 15.	12.	4, 5, 13,14	4, 5, 13SQ. 14SQ	None	12L.	12L.	8L*, 12L.	8L*, 12L.	9L.	10L.	9L, 11L.	10L, 11L.	8L*,10L,11, 12L.
B1.3	11, 17.	11, 16, 17.	None	16.	11, 17.	11, 16, 17.	None	16.	4, 5, 13, 14	4, 5, 13SQ. 14SQ	11, 16, 17.	7L, 12L.	7L, 12L.	7L, 8L**,12L.	7L, 8L**,12L.	9L.	10L.	9L, 11L.	10L, 11L.	8L**, 10L, 11,12L.
B1.4	11, 15, 17.	11, 17.	15.	None	11, 15, 17.	11, 17.	15.	None	4, 5,13,14	4, 5, 13SQ. 14SQ	11, 17.	7L,12L.	7L, 12L.	7L,8L*,12L.	7L,8L*,12L.	9L.	10L.	9L, 11L.	10L, 11L.	8L*, 10L, 11,12L.
B2	6, 7, 11, 15, 17.	6, 7, 11, 16, 17.	6, 7, 12, 15.	6, 7, 12, 16.	6, 7, 11, 15, 17.	6, 7, 11, 16, 17.	6, 7, 12, 15.	6, 7, 12, 16.	None	None	6, 7, 11, 16, 17.	5L, 7L.	4L, 5L, 6L,7L.	5L,7L, 8L.	4L,5L, 6L,7L, 8L.	9L.	10L.	9L, 11L.	10L, 11L.	6, 7, 11 or 12, 15 or 16, 17, 8L, 10L

To / From	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2	B2L	B3	L1C	L1	L2C	L2	L3H	L3G	L4H	L4G	L5
B2L	6, 7, 11, 15, 17.	6, 7, 11, 16, 17.	6, 7, 12, 15.	6, 7, 12, 16.	6, 7, 11, 15, 17.	6, 7, 11, 16, 17.	6, 7, 12, 15.	6, 7, 12, 16.	13SQ, 14SQ.	None	6, 7, 11, 16, 17.	5L, 7L, 12LSQ.	4L, 5L, 6L,7L, 12LSQ	5L,7L, 8L, 12LSQ.	4L, 5L, 6L, 7L, 8L, 12LSQ.	9L.	10L.	9L, 11L.	10L, 11L.	6, 7, 11 or 12, 15 or 16, 7, 8L, 10L
B3	11,15.	11	12,15	12.	2,3,5,-8, 11,15	2,3,5,8, 11.	2,3,5, 8, 12,15	2,3,8, 12.	2,3,4, 5,8,13, 14.	2,3,4, 5, 8, 13SQ.	None	12L.	12L.	8L*, 12L.	8L*, 12L.	9L.	10L.	9L, 11L.	10L, 11L.	2,3,5,8, 11 or 12,8L*, 10L,11L, 12L.

To / From	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2	B2L	B3	L1C	L1	L2C	L2	L3H	L3G	L4H	L4G
L1C	All	All	All	All	All	All	All	All	All	All	All	None	4L, 6L.	8L.	4L, 6L, 8L.	9L.	10L.	8L,9L, 11L.	8L, 10L, 11L.
L1	All	All	All	All	All	All	All	All	All	All	All	None	None	8L.	8L.	9L.	10L.	8L,9L, 11L.	8L,10L, 11L.
L2C	All	All	All	All	All	All	All	All	All	All	All	None	4L,6L.	None	4L, 6L.	9L.	10L.	9L,11L.	10L, 11L.
L2	All	All	All	All	All	All	All	All	All	All	All	None	None	None	None	9L.	10L.	9L,11L.	10L, 11L.
L3H	All	All	All	All	All	All	All	All	All	All	All	5L,7L.	4L,5L, 6L,7L.	5L,7L, 8L.	4L,5L, 6L,7L, 8L.	None	10L.	8L,11L.	8L,10L, 11L.
L3G	All	All	All	All	All	All	All	All	All	All	All	5L,7L.	4L,5L, 6L,7L.	5L,7L, 8L.	4L,5L, 6L,7L, 8L.	9L.	None	8L,9L, 11L.	8L,11L.
L4H	All	All	All	All	All	All	All	All	All	All	All	5L,7L.	4L,5L, 6L,7L.	5L,7L.	4L,5L, 6L,7L.	None	10L.	None	10L.
L4G	All	All	All	All	All	All	All	All	All	All	All	5L,7L.	4L,5L, 6L,7L.	5L,7L.	4L,5L, 6L,7L.	9L.	None	9L.	None

SQ = it depends on system qualification
*: excluding the subjects related to piston engines
**: excluding the subjects related to turbine engines;

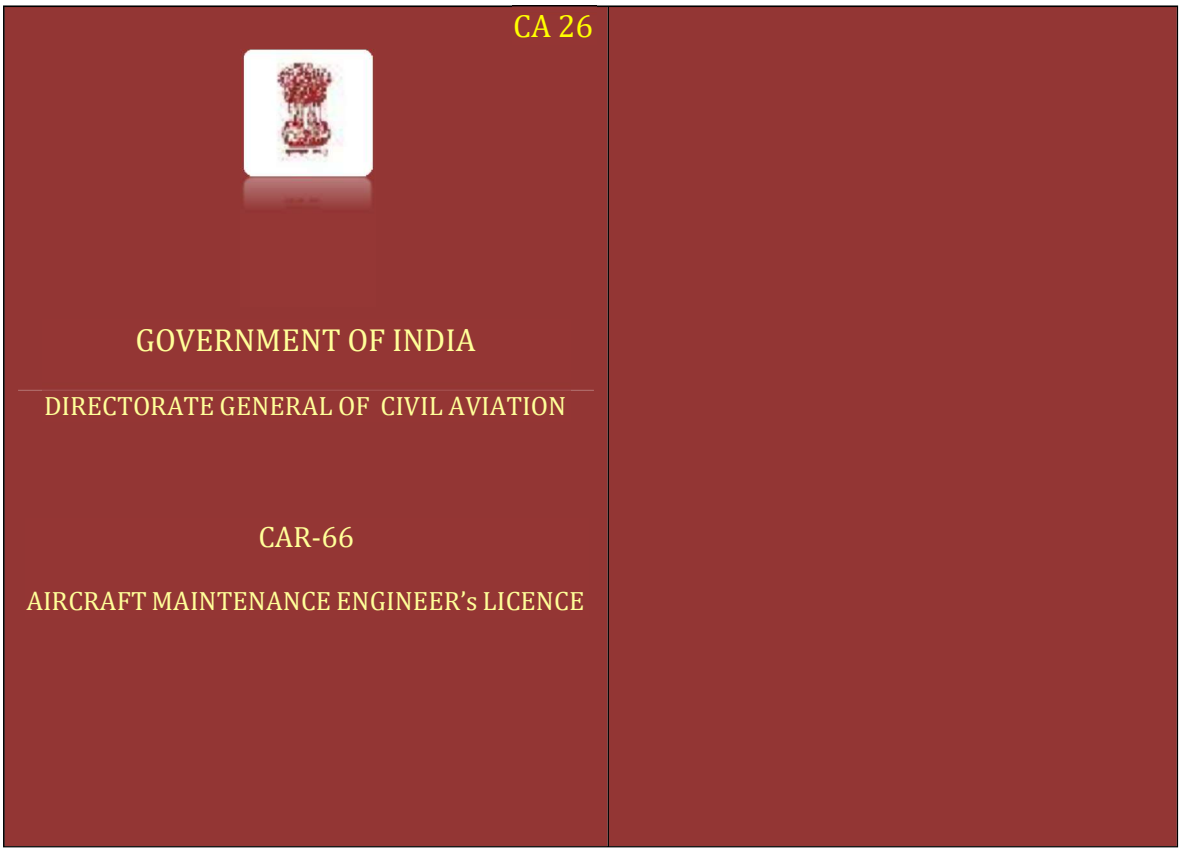
Appendix V- Applications and Formats

Application forms (published on DGCA Website dgca.gov.in and available on eGCA)

Appendix VI - Aircraft Maintenance Engineer's Licence referred to in Rule 61 of the Aircraft Rule 1937 CA Form 26 (Booklet form)/ Plastic Card

1. An example of the aircraft maintenance engineer's licence referred to in CAR-66 can be found on the following pages.
2. The preparation or any change to an existing aircraft maintenance licence shall be carried out by the DGCA.
3. The content of the licence is primarily in English to facilitate easy determination of privileges and validity of ratings. However, contents of the Licence on plastic card are bilingual i.e. in Hindi and English.
4. All basic details are shown on plastic card licence. QR code has been provided to facilitate complete access to the licence details. Upon scanning the QR code, the corresponding licence details will be displayed including particulars marked with an asterisk (*).
5. The holder of the aircraft maintenance licence shall keep it in good condition and shall ensure that no unauthorised entries are made. Failure to comply with this rule may invalidate the license or lead to the holder not being permitted to hold any certification privilege. It may also result in prosecution under Indian Penal Code.
6. The aircraft maintenance licence shall clearly indicate that the limitations are exclusions from the certification privileges. If there are no limitations applicable, the LIMITATIONS page shall be left blank or mention 'Not applicable (NA)'.

(a) CA Form 26 (Booklet form)



<table>
<tr><td>I</td><td colspan="3">INDIA</td><td rowspan="10">IX. CONDITIONS
a. Certified that holder is authorized to exercise the privileges of the licence as given Rule 61 of the Aircraft Rule 1937
b. Endorsement of aircraft types at section XII (b) titled AIRCRAFT TYPE RATING means the holder is qualified to issue a certificate of release to service for such aircraft from the date of endorsement with a valid authorization issued by approved maintenance organization.
c. Holder of this licence shall not exercise the privileges of the licence and related ratings at any time when he/she is aware of any decrease in medical fitness which might render him/her unable to safely and properly exercise these privileges.
d. This licence is not valid unless it bears the signature of the holder.
e. This licence remains current till the valid date specified at section XIV whilst in compliance with the Aircraft Rule 61 and CAR 66 unless previously suspended or revoked.
f. This licence when endorsed with an aircraft type rating meets the intent of ICAO Annex 1.
g. Entry, endorsement or alteration in the licence shall be made by person authorized for this purpose by the Director General.
h. Limitations (if any) specified at section XIII are the exclusions from the certification privileges.</td></tr>
<tr><td>II.</td><td colspan="3">Aircraft Maintenance Engineer’s Licence</td></tr>
<tr><td>III.</td><td>Licence number</td><td></td><td rowspan="3">STAMP SIZE PHOTO</td></tr>
<tr><td>IV.</td><td>Name of holder in full</td><td></td></tr>
<tr><td>IVa</td><td>Date of birth</td><td></td></tr>
<tr><td>V.</td><td>Address of holder</td><td colspan="2"></td></tr>
<tr><td>VI.</td><td>Nationality</td><td colspan="2"></td></tr>
<tr><td>VII.</td><td>Signature of Holder</td><td colspan="2"></td></tr>
<tr><td>VIII.</td><td colspan="3">Issued in accordance with the provisions of the Aircaft Act 1934 and Aircraft Rules 1937.</td></tr>
<tr><td rowspan="2">X</td><td>Signature of Issuing Authority</td><td colspan="2">……
……..……
(for the Director General of Civil Aviation)</td></tr>
<tr><td>Date of Issue:</td><td colspan="2"></td></tr>
<tr><td>XI.</td><td>Stamp of the Issuing Authority</td><td colspan="2"></td></tr>
<tr><td colspan="4">1</td><td>III. LIC No. 2</td></tr>
</table>

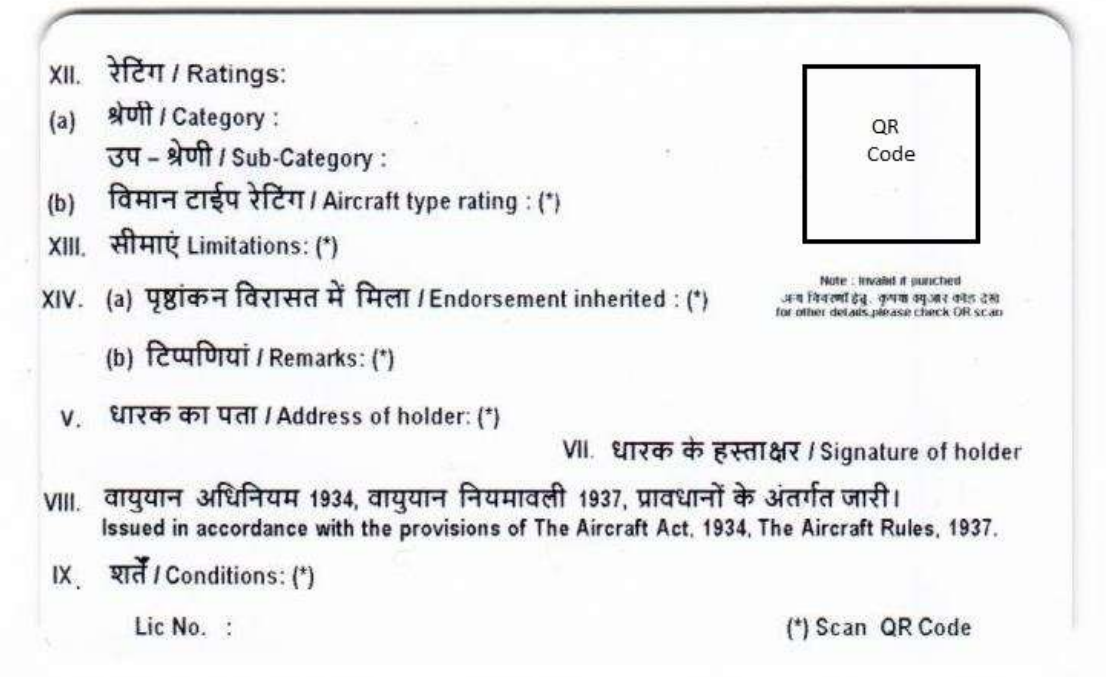
		XII (a). LICENCE (SUB) CATEGORIES							XII (b). AIRCARFT RATING TYPE		
CATEGORIES		A	B1	B2	B2L	B3	L	C	DATE	AIRCRAFT TYPE OR GROUP	CATEGORY	STAMP & DATE
AEROPLANES TURBINE				n/a	n/a	n/a	n/a	n/a				
AEROPLANES PISTON				n/a	n/a	n/a	n/a	n/a				
HELICOPTERS TURBINE				n/a	n/a	n/a	n/a	n/a				
HELICOPTERS PISTON				n/a	n/a	n/a	n/a	n/a				
AVIONICS		n/a	n/a			n/a	n/a	n/a				
AIRCRAFT		n/a	n/a	n/a	n/a	n/a	n/a					
Sailplances, powered sailplanes, LA1 aeroplances, balloons and airships		n/a	n/a	n/a	n/a	n/a		n/a				
PISTON-ENGINE NON-PRESSURISED AEROPLANES OF 2000KG MTOM AND BELOW		n/a	n/a	n/a	n/a			n/a				
III. LIC No.				**3**						**III. LIC No.**	**4**	

XIII. LIMITATIONS				XIV. LICENCE VALIDITY		
AIRCRAFT TYPE OR GROUP	CATEGORY	LIMITATION CODE	SIGNATURE WITH DATE (REMOVAL OF LIMITATION)	VALID TILL	SIGNATURE WITH DATE	SEAL
III. LIC No. 5				**III. LIC No 6**		

XIV (a) LICENCE ENDORSEMENTS INHERITED FROM THE AME LICENCE HELD PRIOR TO CAR-66 LICENCE			XIV (b). REMARKS
RATING	CATEGORY	SIGNATURE WITH DATE	
III. LIC No. 7			**III. LIC No. 8**

(b) Plastic Card (issued through eGCA)





QR CODE OUTPUT

I.

Government of India

II.

Aircraft Maintenance Engineer's Licence

III. LICENCE NO. :

IV. NAME OF HOLDER IN FULL :

IV (a). DATE OF BIRTH :

VI. NATIONALITY :

X. ISSUING OFFICER'S NAME : DATE OF ISSUE :

XI. ISSUING AUTHORITY : DGCA, India

X (a) **DATE OF ISSUE :**

	DATE	NAME OF ISSUING OFFICER	OFFICE
Initial CAR 66 Licence			DGCA, HQ

XII (a). LICENCE CATEGORIES/ SUB-CATEGORIES:

CATEGORY	SUB-CATEGORY	DATE OF ISSUE

XII (b). AIRCRAFT TYPE RATING :

CATEGORY	SUB-CATEGORY	AIRCRAFT TYPE/ GROUP	Date	OFFICE

XIII. LIMITATIONS :

CATEGORY	SUB-CATEGORY	AIRCRAFT TYPE/ GROUP	LIMITATION	LIMITATION REMOVAL DATE	OFFICER'S NAME & DESIGNATION	OFFICE

XIV. LICENCE VALIDITY :

VALID TILL	OFFICER'S NAME & DESIGNATION	DATE OF SIGN	OFFICE

XIV (a). ENDORSEMENTS INHERITED:

RATING	CATEGORY	OFFICER'S NAME & DESIGNATION	DATE

XIV (b). REMARKS:

V. ADDRESS OF HOLDER:

VIII. ISSUED IN ACCORDANCE WITH THE PROVISIONS OF THE AIRCRAFT ACT 1934, , AND AIRCRAFT RULES 1937.

IX. CONDITIONS :

a) Certified that holder is authorized to exercise the privileges of the licence as given in Rule 61 of the Aircraft Rules 1937.

b) Endorsement of aircraft types at section XII (b) titled AIRCRAFT TYPE RATING means the holder is qualified to issue a certificate of release to service for such aircraft from the date of endorsement with a valid authorization issued by approved maintenance organization.

c) Holder of this licence shall not exercise the privileges of the licence and related ratings at any time when he/she is aware of any decrease in medical fitness which might render him/her unable to safely and properly exercise these privileges.

d) This licence is not valid unless it bears the signature of the holder.

e) This licence remains current till the valid date specified at section XIV whilst in compliance with the Aircraft Rule 61 and CAR 66 unless previously suspended or revoked.

f) This licence when endorsed with an aircraft type rating meets the intent of ICAO Annex 1.

g) Entry, endorsement or alteration in the licence shall be made by person authorized for this purpose by the Director General.

h) Limitations (if any) specified at section XIII are the exclusions from the certification privileges.

Appendix VII — Basic knowledge requirements for category L aircraft maintenance licence

The definitions of the different levels of knowledge required in this Appendix are the same as those contained in point 1 of Appendix I of CAR-66.

1.Modularisation

The modules required for each aircraft licence subcategory/category shall be in accordance with the following matrix. Where applicable, the subject modules are indicated by an 'X', while 'n/a' means that the subject module is not applicable nor required.

The basic knowledge requirement for L5 shall be the same as for any B1 subcategory (as indicated in Appendix I) plus other modules as shown in the matrix.

	Licence subcategories								
	Composite sailplanes	Sailplanes	Composite powered sailplanes and composite ELA1 aeroplanes	Powered sailplanes and ELA1 aeroplanes	Hot-air balloons	Gas balloons	Hot-air airships	ELA2 gas airships	Gas airships above ELA2
Subject modules	**L1C**	**L1**	**L2C**	**L2**	**L3H**	**L3G**	**L4H**	**L4G**	**L5**
2L 'Human factors'	X	X	X	X	X	X	X	X	n/a
3L 'Aviation legislation'	X	X	X	X	X	X	X	X	n/a
4L 'Wooden and/or metal-tube structure covered with fabric'	n/a	X	n/a	X	n/a	n/a	n/a	n/a	n/a
5L 'Composite structure'	X	X	X	X	n/a	n/a	n/a	n/a	n/a
6L 'Metallic structure'	n/a	X	n/a	X	n/a	n/a	n/a	n/a	n/a
7L 'Airframe – general, mechanical and electrical systems'	X	X	X	X	n/a	n/a	n/a	n/a	n/a
8L 'Power plant'	n/a	n/a	X	X	n/a	n/a	X	X	X (*)
9L 'Balloons – hot-air balloons'	n/a	n/a	n/a	n/a	X	n/a	X	n/a	n/a
10L 'Balloons – gas (free/tethered) balloons'	n/a	n/a	n/a	n/a	n/a	X	n/a	X	X
11L 'Airships – hot-air/gas AIRSHIPS'	n/a	n/a	n/a	n/a	n/a	n/a	X	X	X

12L 'Radio Com/ELT/Transponder/ Instruments'	X	X	X	X	n/a	n/a	X	X	X

Note: (*) Only applicable propulsion subjects of Module 8L are required; these depend on the B1 subcategory the applicant comes from.

MODULE 2L – HUMAN FACTORS

MODULE 2L – HUMAN FACTORS		Level
2L.1	General	1
2L.2	Human performance and limitations	1
2L.3	Social psychology	1
2L.4	Factors that affect performance	1
2L.5	Physical environment	1
2L.6	The 'Dirty Dozen' and risk mitigation	2
2L.7	Workplace safety and environmental protection	2

MODULE 3L – AVIATION LEGISLATION

MODULE 3L – AVIATION LEGISLATION		Level
3L.1	Regulatory framework	1
3L.2	Continuing airworthiness regulations	1
3L.3	Repairs and modifications (CAR-ML)	2
3L.4	Maintenance data (CAR-ML)	2
3L.5	Licence privileges and how to exercise them properly (CAR-66, CAR-ML)	2

MODULE 4L – WOODEN AND/OR METAL-TUBE STRUCTURE COVERED WITH FABRIC

MODULE 4L – WOODEN AND/OR METAL-TUBE STRUCTURE COVERED WITH FABRIC		Level
4L.1	Airframe wooden/combination of metal tube and fabric	2
4L.2	Materials	2
4L.3	Identifying damages and defects	3
4L.4	Standard repair and maintenance procedures	3

MODULE 5L – COMPOSITE STRUCTURE

MODULE 5L – COMPOSITE STRUCTURE		Level
5L.1	Airframe fibre-reinforced plastic (FRP)	2
5L.2	Materials	2
5L.3	Identifying damages and defects	3
5L.4	Standard repair and maintenance procedures	3

MODULE 6L – METALLIC STRUCTURE

MODULE 6L – METALLIC STRUCTURE		Level
6L.1	Metallic airframe	2
6L.2	Materials	2
6L.3	Identifying damages and defects	3
6L.4	Standard repair and maintenance procedures	3

MODULE 7L – AIRFRAME – GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS

MODULE 7L – AIRFRAME – GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS		Level
7L.1	Theory of flight – gliders and aeroplanes	1
7L.2	Airframe structure – gliders and aeroplanes	1
7L.3	Air conditioning (ATA 21)	1
7L.4	Electrical power, cables and connectors (ATA 24)	2
7L.5	Equipment and furnishing (ATA 25)	2
7L.6	Fire protection and other safety systems (ATA 26)	2
7L.7	Flight controls (ATA 27)	3
7L.8	Fuel system (ATA 28)	2
7L.9	Hydraulic power (ATA 29)	2
7L.10	Ice and rain protection (ATA 30)	1
7L.11	Landing gear (ATA 32)	2
7L.12	Lights (ATA 33)	2
7L.13	Oxygen (ATA 35)	2
7L.14	Pneumatic/vacuum (ATA 36)	2
7L.15	Water ballast (ATA 41)	2
7L.16	Fasteners	2
7L.17	Pipes, hoses and connectors	2
7L.18	Springs	2

MODULE 7L – AIRFRAME – GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS		Level
7L.19	Bearings	2
7L.20	Transmissions	2
7L.21	Control cables	2
7L.22	Fits and clearances	2
7L.23	Aircraft weight and balance	2
7L.24	Workshop practices and tools	2
7L.25	Disassembly, inspection, repair and assembly techniques	2
7L.26	Abnormal events	2
7L.27	Maintenance procedures	2

MODULE 8L – POWER PLANT

MODULE 8L – POWER PLANT		Piston	Turbine	Electrical	Level
8L.1	General engine fundamentals	X	X	X	2
8L.2	Piston engine fundamentals and performance	X			2
8L.3	Piston engine construction	X			2
8L.4	Piston engine fuel system (non-electronic)	X			2
8L.5	Starting and ignition system	X			2
8L.6	Air intake, exhaust and cooling system	X			2
8L.7	Supercharging/turbocharging	X			2
8L.8	Lubrication systems of piston engines	X			2
8L.9	Engine indication systems	X	X	X	2
8L.10	Electric aircraft engines			X	2
8L.11	Turbine engine fundamentals and performance		X		2
8L.12	Inlet and compressor		X		2
8L.13	Combustion chamber, starting and ignition system		X		2
8L.14	Turbine section and exhaust		X		2
8L.15	Other turbine engine components and systems		X		2
8L.16	Turbine engine inspections and ground operation		X		2
8L.17	Propeller	X	X	X	2

MODULE 8L – POWER PLANT		Piston	Turbine	Electrical	Level
8L.18	Full authority digital engine control (FADEC)	X	X	X	2
8L.19	Lubricants and fuels	X	X	X	2
8L.20	Engine and propeller installation	X	X	X	2
8L.21	Engine monitoring and ground operation	X	X	X	2
8L.22	Engine/propeller storage and preservation	X	X	X	2

MODULE 9L – BALLOONS – HOT-AIR BALLOONS

MODULE 9L – BALLOONS – HOT-AIR BALLOONS		Level
9L.1	Theory of flight – hot-air balloons	1
9L.2	General airframe of hot-air balloons	2
9L.3	Envelope	3
9L.4	Heater system/burner	3
9L.5	Basket and basket suspension (including alternative devices)	3
9L.6	Instruments	2
9L.7	Equipment	2
9L.8	Hot-air balloon handling and storage	2
9L.9	Disassembly, inspection, repair and assembly techniques	3

MODULES 10L – BALLOONS – GAS (FREE/TETHERED) BALLOONS

MODULES 10L – BALLOONS – GAS (FREE/TETHERED) BALLOONS		Level
10L.1	Theory of flight – gas balloons	1
10L.2	General airframe of gas balloons	2
10L.3	Envelope	3
10L.4	Netting	3
10L.5	Valves, parachutes and other related systems	3
10L.6	Load ring	3
10L.7	Basket (including alternative devices)	3
10L.8	Ropes and lines	3
10L.9	Instruments	2
10L.10	Tethered gas balloon (TGB) systems	3

10L.11	Equipment	2
10L.12	Gas balloon handling and storage	2
10L.13	Disassembly, inspection, repair and assembly techniques	3

MODULES 11L – AIRSHIPS – HOT-AIR/GAS AIRSHIPS

MODULES 11L – AIRSHIPS – HOT-AIR/GAS AIRSHIPS		Level
11L.1	Theory of flight and control of airships	2
11L.2	Airship airframe structure – general concepts	2
11L.3	Airship envelope	2
11L.4	Gondola	3
11L.5	Airship flight control (ATA 27/55)	3
11L.6	Electrical power (ATA 24)	3
11L.7	Lights (ATA 33)	2
11L.8	Ice and rain protection	3
11L.9	Fuel systems (ATA 28)	2
11L.10	Engine and propellers in airships	2
11L.11	Airship handling and storage	2
11L.12	Disassembly, inspection, repair and assembly techniques	2

MODULE 12L – RADIO COM/ELT/TRANSPONDER/INSTRUMENTS

MODULE 12L – RADIO COM/ELT/TRANSPONDER/INSTRUMENTS		Level
12L.1	Radio Com/ELT	2
12L.2	Transponder and FLARM	2
12L.3	Instruments	2
12L.4	Avionics general test equipment	1‘;

AMC1 Appendix VII Basic knowledge requirements for category L aircraft maintenance licence

MODULE 2L — HUMAN FACTORS

MODULE 2L — HUMAN FACTORS	Level
2L.1 General — The need to take human factors into account in the maintenance domain; — Incidents attributable to human factors/human error; — Murphy's law	1
2L.2 Human performance and limitations Vision, hearing, information processing, attention and perception, memory.	1
2L.3 Social psychology Responsibility, motivation, peer pressure, teamwork	1
2L.4 Factors that affect performance Fitness, physical and mental health, stress, sleep, fatigue, alcohol, medication, drug abuse	1
2L.5 Physical environment Working environment (climate, noise, illumination).	1
2L.6 The 'Dirty Dozen' and risk-mitigation The 'Dirty Dozen': — lack of communication — lack of teamwork — lack of assertiveness — complacency — fatigue — stress — lack of knowledge — lack of resources — lack of awareness — distraction — pressure — norms. Risk-mitigation methods.	2
2L.7 Workplace safety and environmental protection — *Safe working practices and precautions when working with electricity, gases (especially oxygen), oils, and chemicals;* — Labelling, storage and disposal of hazardous (to workplace safety and environment) materials;	2

MODULE 2L — HUMAN FACTORS	Level
Remedial action in the event of a fire or another accident with one or more hazards,including knowledge of fire-extinguishing agents.	

MODULE 3L — AVIATION LEGISLATION

MODULE 3L — AVIATION LEGISLATION	Level
3L.1 Regulatory framework — Role of the DGCA India – Scope and limitations of the regulatory framework	1
3L.2 Continuing airworthiness regulations — General understanding of the applicable parts of CAR-66; — General understanding of the applicable parts of CAR-ML; — General understanding of the applicable parts of CAR-CAO; — General understanding of CAR-M, CAR-CAMO and CAR-145.	1
3L.3 Repairs and modifications (CAR-ML) — Approval of changes (repairs and modifications); — Standard changes and standard repairs	2
3L.4 Maintenance data (CAR-ML) – Airworthiness directives (ADs), safety information bulletins (SIBs); – Service bulletins (SBs), instructions for Continuing Airworthiness (ICAs) (AMM, IPC, etc.), – aircraft flight manual (AFM), maintenance records, maintenance programmes	2
3L.5 Licence privileges and how to exercise them properly (CAR-66, CAR-ML) *Conditions for release to service:* *— in a maintenance organisation;* *— as independent certifying staff;* *— release-to-service procedures*	2

MODULE 4L — WOODEN AND/OR METAL-TUBE STRUCTURE COVERED WITH FABRIC

MODULE 4L — WOODEN AND/OR METAL-TUBE STRUCTURE COVERED WITH FABRIC	Level
4L.1 Airframe wooden/combination of metal tube and fabric — General construction principles for wooden structures covered with fabric, metal-tube structures covered with fabric, and combination of wooden and metal-tube structures; — Wood as a technical material (heartwood, sapwood, grain, etc.); — Wood defects (types, acceptable/ not acceptable); — Different woodcuts (tangential cuts, radial cuts, etc.) and their properties (tangential cuts, radial cuts, etc.);	2

MODULE 4L — WOODEN AND/OR METAL-TUBE STRUCTURE COVERED WITH FABRIC	Level
— Metal tubing (mechanical and stress properties of metal tubes); — Types of welding and welding joints; — General characteristics of aircraft coverings; — General characteristics of paint; — Transmission of loads in and between structures.	
4L.2 Materials – Types of wood (solid wood, laminated wood, plywood, wood composites), suitable wood materials and their properties (spruce, firs, etc.), wood defects (acceptable / not acceptable), stability, deterioration (temperature, humidity, ageing, etc.); – Types of covering and technologies (natural and synthetic polymers), deterioration; – Types of glues, adhesives, paints and other associated materials; – Types of metal-tubing material (steel, light alloy tubes, etc.); – Welding seams, fittings, screws and bolts (material and properties); – Proper storage of those materials; – Plastics (overview and understanding of their properties).	2
4L.3 Identifying damages and defects – Inspection procedures; – Damage identification in wooden structures (heavy landing, rot, glue failure, fungi, shrinkage, stress damage, cracks, fatigue, etc.); – Damage identification in metal-tube structures (hard landing, stress, corrosion, fatigue,dents, cracks, fatigue, etc.); – Damage identification in welded seams; – Damage identification in fabric coverings (tears, strains, UV damage, hard landing, etc.).	3
4L.4 Standard repair and maintenance procedures – Repair and conservation of wooden aircraft structures: wing rib, wing spar, bolt andbrushing holes, patches (fabric, splayed, surface, plug, scarf); – Repair and reapplication of fabric on aircraft (fabric, tape, lacing, threads, seams, fabricprotection, stitching, knots, fasteners, finishing tape, rings and grommets, dope); – Repair and corrosion protection/prevention methods for metal-tube aircraft structures(welding, patch plates, reinforcement tubes, sleeves, etc.); – Repair, removal and application of paint and dope on airframes in wooden / combinationof metal tube and fabric (surface preparation, application and finish).	3

MODULE 5L — COMPOSITE STRUCTURE

MODULE 5L — COMPOSITE STRUCTURE	Level
5L.1 Airframe fibre-reinforced plastic (FRP) – General construction principles of airframes in FRP and its properties; – Characteristics of laminated structures (matrix and fibres); – Fibre (fibre orientation, strength characteristics, isotropic, anisotropic, filament, strands,tows, yarns, rovings, impreg and prepreg); – Fabric weave styles (plain weave, twill weave, atlas weave, unidirectional) and non-wovenmaterial (stitched and knotted) and their characteristics; – Matrix (thermosetting, thermoplastic, curing stages); – Characteristics of sandwich structures and their supporting cores (honeycombs, foams,wooden cores, pseudo-cores); – General characteristics of accelerators and additives/modifiers; – Transmission of loads in and between structures.	2
5L.2 Materials – Types of fibres (fibreglass, E-glass, aramid, carbon/graphite, boron, ceramic, lightning protection fibre); – Types of matrices (different types, properties and application); – Types of resin filler materials (fumed silica, glass powder, hollow glass, phenolic and plasticmicroballoons, cotton, flox, colour pigments, fire retardants); – Types of sandwich structure core materials (honeycombs: aramid paper, kraft paper, thermoplastic, aluminium, fibreglass, carbon; foams: polystyrene, phenolic, polyurethane,polypropylene, PVC, polymethacylimide; balsa wood); – Behaviour, interaction, and technological aspects of composites made of those materials; – Storage and handling of those materials.	2
5L.3 Identifying damages and defects – Inspection procedures (visual inspection, tapping, NDT testing, etc.); – Types of manufacturing defects and damages and their causes (fibre breakage, matrix imperfections, delamination, debonding, improper drilling, environmental degradation, impact damage, fatigue, erosion, corrosion, UV damage, hard landing, stress, etc.).	3
5L.4 Standard repair and maintenance procedures – Repairs of aircraft structures: wing, rib, wing spar, aerofoil, bolt and brushing holes,patches, sandwich core and faceplate repairs, bolted and bonded repairs; – Proper construction and repair fittings, and load-bearing points for composites and composite sandwich structures; – Creation and use of repair moulds from the airframe or intact parts (types, procedures,coatings, etc.); – Proper procedure for the mixing of resins, fibre layering and curing of composites; – Bonding metals and other materials; – Composite painting and finish.	3

MODULE 6L — METALLIC STRUCTURE

MODULE 6L — METALLIC STRUCTURE	Level
6L.1 Metallic airframe – General construction principles for metal-structure airframes; – General knowledge of the properties of metal as a technical material (classification; physical, mechanical and electrical properties; manufacturing properties; chemical properties); – General knowledge of the properties of pure metals and alloys; – Metal grain structure of pure metals and alloys and its impact on behaviour (grain boundaries; corrosion; hardening; annealing; differences between forged, machined and cast metals); – Stresses in structural members (tension, compression, torsion, shearing, bearing, bending); – Types of corrosion and corrosion protection (electrochemical oxidation, galvanic corrosion, stress-corrosion cracking, corrosion in passivated materials, high-temperature corrosion); – Types of rivets and fasteners (solid shank rivet, blind rivets, self-plugging rivets (mechanical and friction lock), pull-thru rivets, pin rivets, head styles, taper-lok, rivet nut, lockbolt, highshear fastener, identification, measuring); – Types of welding and welding joints; – Transmission of loads in and between structures.	2
6L.2 Materials – Types of iron and steel, and their alloys in aviation (cast, forged, tempering, corrosion,strength properties); – Types of aluminium and aluminium alloys in aviation in airframes, rivets, and fasteners(strength properties, corrosion); – Common alloying elements for steel and aluminium (influence on the mechanical andphysical properties of the alloy); – Common paint and surface protection materials; – Common adhesives for use with metals.	2
6L.3 Identifying damages and defects – Inspection procedures (sheet metal, structure, bonded joints, soldered joints, welded andbrazed joints, riveted joints, corrosion); – Identification and classification of cracks, fatigue, and corrosion in metallic structures.	3
6L.4 Standard repair and maintenance procedures – Metal and sheet metal (marking out and calculation of bend allowance, cutting, drilling,bending and forming, inspection of metal work); – Welding, brazing, soldering and bonding (soldering methods, welding and brazing methods, bonding methods); – Riveting (riveted joints, rivet spacing and pitch; tools used for riveting and	3

MODULE 6L — METALLIC STRUCTURE	Level
dimpling;inspection of riveted joints); – Repairing by patching, insertion, and replacement of parts; – Corrosion treatment; – Problems in multiple-material systems.	

MODULE 7L — AIRFRAME: GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS

MODULE 7L — AIRFRAME: GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS	Level
7L.1 Theory of flight — gliders and aeroplanes Aerodynamics and flight controls: – Airflow around a body; – Boundary layer, laminar and turbulent flow; – Thrust, weight, aerodynamic resultant; – Generation of lift and drag angle of attack, polar curve, stall. Operation and effect of roll control, pitch control, yaw control and rudder limiters: – Control using dual-purpose controls; – High-lift devices, slots, slats, flaps, flaperons; – Drag-inducing devices, lift dumpers, speed brakes, dive brakes; – Effects of wing fences, saw tooth leading edges; – Boundary layer control using vortex generators, stall wedges or leading-edge devices; — Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs,spring tabs, mass balance, control surface bias, aerodynamic balance panels.	1

MODULE 7L — AIRFRAME: GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS	Level
7L.2 Airframe structure — gliders and aeroplanes – Fuselage: construction (truss type, monocoque, semimonocoque), attach points (wing, tailplane, undercarriage); – Wings: construction (monospar, multispar, box beam), configurations (cantilever, semicantilever, strut/wire braced), fairing; – Stabilisers: construction, control surface attachments; – Flight control surfaces: construction and attachment, balancing (mass and aerodynamics); – Tow hooks (Schweizer and Tost hook); – Aircraft assembly, storage, jacking, chocking, securing and associated safety precautions; – Effects of environmental conditions on aircraft handling and operation.	1
7L.3 Air conditioning (ATA 21) Heating and ventilation for small aircraft.	1
7L.4 Electrical power, cables, and connectors (ATA 24) – Installation and operation of batteries; – Power generation / power sources (AC/DC) on small aircraft, voltage regulation, powerdistribution and circuit protection; – Cable types, construction and characteristics, high-tension and coaxial cables, testing andinstallation precautions; – Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes, pin insertion and removal; – Crimping (crimping, tools, testing of crimp joints); – Continuity, insulation and bonding techniques and testing; – Wiring protection techniques (cable looming and loom support, cable clamps, protectivesleeving techniques (including heat shrink wrapping), shielding).	2
7L.5 Equipment and furnishing (ATA 25) – Emergency equipment requirements; — Seats, harnesses, and belts.	2
7L.6 Fire protection and other safety systems (ATA 26) – Portable fire extinguisher; — Rescue systems (safety parachute, recovery parachute, launching systems, including safety measures for pyrotechnics).	2

MODULE 7L — AIRFRAME: GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS	Level
7L.7 Flight controls (ATA 27) — Primary controls: aileron, elevator/stabilator, rudder, dual-purpose controls (stabilator,ruddervator, flaperons); — Secondary controls: elevator trim systems, wing flaps, slats and spoilers / dive breaks; — System operation: manual; — Gust locks, balancing and rigging of flight controls; — Simple stall-warning systems.	3
7L.8 Fuel system (ATA 28) – System layout; – Fuel tanks; – Supply systems; – Indications and warnings; – Refuelling and defuelling.	2
7L.9 Hydraulic power (ATA 29) – System layout; – Hydraulic fluids; – Hydraulic reservoirs and accumulators, pressure generation (electric, mechanical), filters,pressure control, power distribution, indication and warning systems.	2
7L.10 Ice and rain protection (ATA 30) – Hydrophobic coatings; — Pitot probe heating.	1
7L.11 Landing gear (ATA 32) – Construction (tricycle, tailwheel, outrigger wheels, skids), shock absorbing; – Extension and retraction systems: normal and emergency operation; – Indications and warnings; – Wheels, brakes, tyres, and steering; — Standard repair and maintenance procedures for the landing gear.	2
7L.12 Lights (ATA 33) – External lights: navigation, anticollision, landing, taxiing; — Internal lights: cockpit.	2
7L.13 Oxygen (ATA 35) – System layout: storage system (containers), delivery system (continuous flow, diluterdemand and pressure demand) and masks/nasal cannula; – System operation, including charging and discharging; — The 'PRICE' check.	2

MODULE 7L — AIRFRAME: GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS	Level
7L.14 Pneumatic/vacuum (ATA 36) – System layout; – Sources, pumps, control and distribution; — Indication and warnings.	2
7L.15 Water ballast (ATA 41) Water tanks (main tank, fin tank), drain valves, vents	2
7L.16 Fasteners – Screw threads: nomenclature, forms, dimensions and tolerances, and measuring; – Bolts, studs and screws: types (specifications, identification, markings, international standards), nuts (self-locking, anchor, standard types), machine screws (aircraft specifications), studs (types and uses, insertion and removal), self-tapping screws, dowels; – Locking devices: tab and spring washers, locking plates, split pins, pal-nuts, wire locking, quick-release fasteners, keys, circlips, cotter pins; – Aircraft rivets: types of solid and blind rivets: specifications and identification, heat treatment.	2
7L.17 Pipes, hoses, and connectors – Types and connectors of pipes and hoses for hydraulic, fuel, oil, pneumatic and air; – Bending, belling/flaring, inspection, testing and installation of pipes and hoses	2
7L.18 Springs Types of springs, materials, characteristics, applications, inspection, and testing.	2
7L.19 Bearings – Purpose of bearings, loads, material, construction; Types of bearings, their application, testing, cleaning, inspection, lubricationrequirements, and common defects in bearings and their causes.	2
7L.20 Transmission – Gear types, their application, gear ratios, reduction and multiplication gear systems, drivenand driving gears, idler gears, mesh patterns, inspection of gears, backlash/play; – Types, application and inspection of belts and pulleys, chains and sprockets; – Inspection of screw jacks, lever devices, push–pull rod systems.	2
7L.21 Control cables – Types of cables, end fittings, turnbuckles, compensation devices, pulleys, cable systemcomponents, Bowden cables and aircraft flexible control systems; – Swaging of end fittings; – Inspection and testing of control cables, Bowden cables, and aircraft flexible controlsystems.	2

MODULE 7L — AIRFRAME: GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS	Level
7L.22 Fits and clearances Common system of fits, clearances and tolerances, drill sizes for bolt holes, classes of fits, schedule of fits and clearances for aircraft and engines, limits for bow, twist and wear, standard methods for checking shafts, bearings and other parts.	2
7L.23 Aircraft weight and balance Calculation of centre-of-gravity / balance limits: use of relevant documents, preparation of aircraft for weighing, aircraft weighing.	2
7L.24 Workshop practices and tools – Common hand-tool types, power-tool types, precision tool types and equipment, theiroperation, care, control, calibration, and standards; – Operation, function and use of electrical general test equipment; – Proper handling of engineering drawings, diagrams and standards, and comprehension ofthe information presented thereupon (symbols, schematics and diagrams); – Use of workshop materials; – Dimensions, allowances and tolerances, standards of workmanship; – Lubrication equipment and methods.	2
7L.25 Disassembly, inspection, repair, and assembly techniques – Types of defects and visual inspection techniques; corrosion removal, assessment andreprotection; – General repair methods, structural repair manual; ageing, fatigue and corrosion controlprogrammes; – Non-destructive inspection techniques, including penetrant, radiographic, eddy current,ultrasonic and borescope methods; – Disassembly and reassembly techniques; – Troubleshooting techniques.	2
7L.26 Abnormal events Inspection following lightning strike, HIRF penetration, heavy landing, and flight through turbulence.	2
7L.27 Maintenance procedures Maintenance planning, modification procedures, stores procedures, maintenance inspection /quality control / quality assurance, additional maintenance procedures, control of life-limited components.	2

MODULE 8L — POWER PLANT

MODULE 8L — POWER PLANT	Level
8L.1 Engine fundamentals — general — Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle; — The relationship between force, work, power, energy, velocity, and acceleration; — Mechanical, thermal, and volumetric efficiencies.	2
8L.2 Piston-engine fundamentals and performance — Operating principles: 2-stroke, 4-stroke, Otto, Diesel, and Rotary (Wankel); — Piston displacement and compression ratio; — Engine configuration and firing order; — Power calculation and measurement; — Factors that affect engine power; — Mixtures/leaning, pre-ignition.	2
8L.3 Piston-engine construction — Crank case, crank shaft, cam shafts, sumps; — Accessory gearbox; — Cylinder and piston assemblies; — Connecting rods, inlet and exhaust manifolds; — Valve mechanisms; — Propeller reduction gearboxes.	2
8L.4 Piston-engine fuel system (non-electronic) — Carburettors (types, construction and principles of operation, icing and heating); — Fuel injection systems (types, construction, and principles of operation).	2
8L.5 Starting and ignition systems — Starting systems, preheat systems; — Magneto types, construction, and principles of operation; — Ignition harnesses, spark plugs; — Low- and high-tension systems.	2
8L.6 Air-intake, exhaust, and cooling systems — Construction and operation of induction systems, including alternate air systems; — Exhaust systems, engine cooling systems — air and liquid.	2
8L.7 Supercharging/turbocharging — Principles and purpose of supercharging and its effects on engine parameters; — Construction and operation of supercharging/turbocharging systems; — System-associated terminology; — Control systems; — System protection.	2
8L.8 Lubrication systems of piston engines System operation/layout and components.	2
8L.9 Engine indication systems – Indication systems specific to general combustion engines (coolant temperature, oil pressure and temperature, exhaust gas temperature, fuel pressure and flow); – Indication systems specific to piston engines (cylinder head temperature, manifold pressure, engine speed); – Indication systems specific to turbine engines (exhaust gas temperature, engine	2

MODULE 8L — POWER PLANT	Level
thrustindication, engine speed); – Indication systems specific to electric engines (voltage).	
8L.10 Electric aircraft engines — Types and construction of electric motors (AC and DC motors, rotor, stator, bearings,windings, commutator, self-commutated, externally commutated, outrunner and inrunner, motor cooling, etc.); — Power electronics; — Transformer, transducer, and inverter; — Engine control systems; — Power storage systems (common high-density batteries, chemistry batteries, loadcycles, degradation, effects of charging and overcharging, thermal runaway); — Battery management systems (general functions, battery balancing, monitoring); — Wiring of electric power storage, power electronics, and electric motor; High-energy safety procedures.	2
8L.11 Turbine-engine fundamentals and performance — Constructional arrangement and operation of turbojet and turboprop engines; — Thrust: thrust horsepower, shaft horsepower, specific fuel consumption; — Engine pressure ratio; — Pressure, temperature, and velocity of gas flow; Engine ratings, static thrust, limitations.	2
8L.12 Inlet and compressor — Compressor inlet; — Axial and centrifugal compressor types, constructional features, operating principlesand applications; — Compressor (stator, rotor, blisk, disk, blades, compressor stall and surge); Compressor ratio.	2
8L.13 Combustion chamber, starting and ignition system — Constructional features and principles of operation; — Operation of engine start systems and components; Ignition systems and components (exciter, ignition plugs and glow plugs).	2
8L.14 Turbine section and exhaust — Operation and characteristics of different turbine blade types, nozzle guide vanes; — Gas producer turbine and power turbine, blade-to-disk attachment; — Causes and effects of turbine blade stress and creep; Engine exhaust nozzle and noise reduction.	2
8L.15 Other turbine-engine components and systems — General knowledge of the type features and principles of bearings and seals in turbineengines; — System operation, layout and components of lubrication systems in small turbineengines (separate lubrication, as part of the fuel system); — System operation, layout and components of air and fuel systems in small turbineengines; — Turboprop reduction gears.	2

MODULE 8L — POWER PLANT	Level
8L.16 Turbine-engine inspection and ground operation — Standard procedures for starting and ground run-up and interpretation of enginepower output and parameters; — Inspection of engine and components to criteria, tolerances and data specified by theengine manufacturer; — Foreign object damage (FOD).	2
8L.17 Propeller — Propeller fundamentals (blade element theory, blade angles, angle of attack, rotationalspeed, propeller slip, aerodynamic/centrifugal/thrust forces, torque, relative airflow, vibration and resonance); — Propeller construction (methods of construction and materials used in wooden/composite/metal propellers, blade station, blade face, blade shank, bladeback/thrust face and hub assembly, fixed pitch, controllable pitch, constant speed propeller, propeller/spinner installation); — Propeller pitch control (speed control and mechanical/electrical pitch change methods,feathering, propeller accumulators, overspeed protection); — Environmental protection (de-icing and metal tipping); — Propeller balancing (static and dynamic) and blade tracking; — Damage assessment, erosion, corrosion, impact damage, delamination and decay; — Standard treatment and repair methods for propellers.	2
8L.18 Full authority digital engine control (FADEC) — Operation of engine control and fuel-metering systems in piston and turbine engines,including electronic engine control (FADEC); — System layout and components.	2
8L.19 Lubricants and fuels — Properties and specifications of standard, alternate and drop-in fuels, fuel additives, and lubricants.	2
8L.20 Engine and propeller installation — Construction of nacelles; — Configuration of firewalls, cowlings, acoustic panels, engine mounts, antivibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, liftingpoints and drains; — Extension and retraction systems, including propeller position control; — Propeller installation.	2
8L.21 Engine monitoring and ground operation — Procedures for starting and ground run-up; — Interpretation of engine power output and parameters; — Inspection of engine and components to criteria, tolerances and data specified by theengine manufacturer; — Foreign object damage (FOD).	2
8L.22 Engine/propeller storage and preservation — Preservation and depreservation of the engine, the propeller, and accessories/systems.	2

MODULE 9L — BALLOONS: HOT-AIR BALLOONS

MODULE 9L — BALLOONS: HOT-AIR BALLOONS	Level
9L.1 Theory of flight — hot-air balloons — Aerostatics and controls; — Principles; — Effect on envelopes, wind effect, altitude, and temperature effects.	1
9L.2 General airframe of hot-air balloons Components and assembly of a hot-air balloon: — Identification plate; — Envelope; — Heater system / burner; — Suspension cables; — Basket; — Lines and ropes (crown line, actuationline).	2
9L.3 Envelope — Shape and assembly of envelope (poles, equator, panels, gores, special shapes); — Fabrics, seams, and materials; — Crown ring; — Deflation port/parachute and ripping panel; — Load tapes (horizontal and vertical) and rip stoppers; — Turning vent; — Mouth; — Skirt/scoop; — Diaphragms/catenaries (special shapes).	3
9L.4 Heater system / burner — System layout (burner, fuel tanks, fuel lines); — Types of burners (whisper-/cow-burner, main/take-off burner); — Functionality, materials, use, inspection, and care of: — fuel tanks (propane cylinders, material, valves, fittings, fuel quantity gauge), — fuel lines / gas hoses, — burner (piezo igniter, pilot light and valve, blast valve, heat exchanger / burner coils,nozzle, etc.).	3
9L.5 Basket and basket suspension (including alternative devices) — Common assembly of and materials for hot-air balloon baskets; — Rigging points, burner frame, burner support rods, metal frame, basket padding andleather trim; — Basket weave, grab handles, cylinder attachment, take-off aid and rope; — Basket wire and basket wire routing; — Basket floor, basket frame / load-bearing frame, sliders, rawhide protective covering.	3

MODULE 9L — BALLOONS: HOT-AIR BALLOONS	Level
9L.6 Instruments Basic operation, maintenance, and testing of: — altimeter (mechanical and electronic); — variometer (mechanical and electronic); — pyrometer / temperature sensors; — Mode S transponder; — VHF radio; — Emergency locator transmitter (ELT) and personal locator beacon (PLB).	
9L.7 Equipment — Required equipment for free-ballooning operation and its care.	2
9L.8 Hot-air balloon handling and storage — Ground procedures for hot-air balloons, rigging and launch preparation; — Safe handling of propane; — Effects of environmental conditions on hot-air balloon handling.	2
9L.9 Disassembly, inspection, repair, and assembly techniques — Types of defects and visual inspection techniques; — Allowable damage to and tolerance of envelope, basket, lines, ropes, etc.; — Common test procedures (grab test); — General repair methods for envelopes, load ring, ropes and lines, basket; — Inspection methods for envelopes, ropes and lines, basket; — Ageing, fatigue; — Disassembly and reassembly techniques; — Troubleshooting techniques.	3

MODULE 10L — BALLOONS: GAS (FREE/TETHERED) BALLOONS

MODULE 10L — BALLOONS: GAS (FREE/TETHERED) BALLOONS	Level
10L.1 Theory of flight — gas balloons Aerostatics and controls: — Principles; — Effect on envelopes, wind effect, altitude, and temperature effects.	1

MODULE 10L — BALLOONS: GAS (FREE/TETHERED) BALLOONS	Level
10L.2 General airframe of gas balloons Components and assembly of a gas balloon: — Identification plate; — Envelope; — Valve; — Netting; — Load ring (hoop); — Basket; — Lines and ropes (drag rope, mooring line, valve line, emergency opening rope, ripping line, neckline).	2
10L.3 Envelope — Shape and assembly of envelope (poles, equator, panels); — Fabrics, seams, and materials; — Deflation opening and parachute; — Load belt; — Ripping panel; — Appendix; — Emergency opening; — Holding-down patches; — Ballonets; — Electrostatic properties.	3
10L.4 Netting — Netting assembly (net ring, net, mesh); — Mesh dimensions (knots, sizes, angles); — Materials for netting and accessories; — Electrostatic properties.	3
10L.5 Valves, parachutes, and other related systems — Construction, operation, maintenance and testing of manoeuvring/helium valves, pressurerelief valves, gas-tight parachutes, and ballonet fans; — Construction, operation, maintenance and testing of parachute-centring belt and pull-down belts.	3
10L.6 Load ring — Function, material, and common problems (steel pipe, strops, toggles).	3
10L.7 Basket (including alternative devices) Common assembly of and materials for hot-air/gas balloon baskets: — Metal frame, basket padding and leather trim; — Basket weave, grab handles, basket strops and toggles, ballast system (bags, support andsand dumpers); — Basket wire and basket wire routing; — Basket floor, basket frame / load-bearing frame, sliders, rawhide protective covering.	3

MODULE 10L — BALLOONS: GAS (FREE/TETHERED) BALLOONS	Level
10L.8 Ropes and lines Functionality, materials, use, inspection, and care of: — Shroud lines / envelope ropes / bridles; — Trail rope /drag rope and trail-rope bag; — Holding ropes; — Valve line/ valve cord and parachute rope; — Emergency opening rope; — Appendix pull-close rope; — Appendix anchor line; — Inflation aid.	3
10L.9 Instruments Basic operation, maintenance, and testing of: — Altimeter (mechanical and electronic); — Variometer (mechanical and electronic); — Mode-S transponder; — VHF radio; — Emergency locator transmitter (ELT) and personal locator beacon (PLB).	2
10L.10 Tethered gas balloon (TGB) systems Functionality, operation, materials, use, inspection, and care of: — Launch platform; — Winch system: winch (electric, hydraulic, emergency operation), tether cable (cable,sheaves, swivel, clamps), and control panel; — Gondola (metal-tubing construction); — Night lighting.	3
10L.11 Equipment — Required equipment for free-ballooning and for tethered operations, and its care.	2
10L.12 Gas-balloon handling and storage — Ground procedures and mooring for gas balloons and tethered gas balloons, ballasting,rigging and launch preparation; — Safe handling of hydrogen, helium, illuminating gas, and other lifting gases; — Lifting gas (charging, purifying and leak testing, pressure monitoring); — Effects of environmental conditions on gas-balloon handling.	2
10L.13 Disassembly, inspection, repair, and assembly techniques — Types of defects and visual inspection techniques; — Allowable damage to and tolerance of envelope, basket, lines, ropes, etc.; — Common test procedures (grab test, tensile strength, tear growth, porosity, electricresistivity, etc.); — General repair methods for envelopes, load ring, ropes and lines, basket/gondola; — Inspection methods for envelopes, load ring, ropes and lines, basket/gondola (especiallyfor steel frames and welds on TGB gondolas); — Ageing, fatigue and corrosion control programmes; — Disassembly and reassembly techniques; — Troubleshooting techniques.	3

MODULE 11L — AIRSHIPS: HOT-AIR/GAS AIRSHIPS

MODULE 11L — AIRSHIPS: HOT-AIR/GAS AIRSHIPS	Level
11L.1 Theory of flight and control of airships — Control using fins, rudders and elevators; — Aerodynamic lift and aerodynamic balance; — Stability and control; — Free ballooning; — Operation of trim tabs, balance and antibalance (leading) tabs, servo tabs, spring tabs,mass balance, control surface bias, aerodynamic balance panels; — Vectored thrust; — Fire and lightning protection.	2
11L.2 Airship airframe structure — general concepts — Classification of airships (rigid airship, semi-rigid airship, non-rigid airship); — Construction of semi-rigid airships (envelope, ballonet, membranes, nose cone, internalstructures, keel, trusses, longerons, suspension lines); — Construction of non-rigid airships (envelope, ballonet, catenary curtains, suspension lines,air scoops); — Attachment of stabilisers and control surfaces to the airframe.	2
11L.3 Airship envelope — Nose cone battens / bow strips; — Catenary systems (catenary curtain, support/suspension cables); — Ballonets and their positioning (forward, aft); — Air systems (air scoops, ballonet fans, empennage air system, dampers and transfer fans).	2
11L.4 Gondola — General knowledge of gondola construction (metal-tubing gondolas, metal-structuregondolas, composite gondolas); — Doors, windows, and hatches; — Attachment of the gondola to the airframe/envelope; — Gondola layout, equipment and furnishing (emergency equipment requirements, seats,harnesses and belts); — Simple water/waste systems in airships; — Gondola heating and ventilation (ventilations and heating systems, heat exchanger,blower); — Landing gear (construction, shock absorbing, tyres, weight-on-wheels).	3
11L.5 Airship flight controls (ATA 27/55) — Primary controls (rudder, elevator, asymmetric thrust, thrust vectoring); — Trim control; — System operation: manual, hydraulic, pneumatic, electrical, fly-by-wire; — Balancing and rigging.	3
11L.6 Electrical power (ATA 24) — Installation and operation of batteries; — DC power generation; — AC power generation; — Voltage regulation; — Power distribution; — Wiring, electrical connections;	3

MODULE 11L — AIRSHIPS: HOT-AIR/GAS AIRSHIPS	Level
— Inverters, transformers, rectifiers; — Circuit protection; — External/ground power.	
11L.7 Lights (ATA 33) — External: navigation, anticollision, landing, taxiing, ground approach light, aft landing light; — Internal: flight compartment (cockpit) and passenger compartment (cabin); — Emergency.	2
11L.8 Ice and rain protection — Windscreen wipers and windscreen de-misting systems; — Surface de-icing systems.	3
11L.9 Fuel systems (ATA 28) — System layout; — Fuel tanks: venting, draining; — Supply systems; — Cross-feed and transfer; — Indications and warnings; — Refuelling and defuelling.	2
11L.10 Engine and propellers in airships — General understanding of engine layout, thrust vectoring, swivel systems, ducted propellers and control system.	2
11L.11 Airship handling and storage — Ground procedures and mooring with and without mooring mast, ballasting, hangaring,rigging and launch preparation; — Lifting gas (charging, purifying and leak testing, pressure monitoring); — Effects of environmental conditions on airship handling.	2
11L.12 Disassembly, inspection, repair, and assembly techniques — Types of defects and visual inspection techniques; — Corrosion removal, assessment and reprotection; — General repair methods, structural repair manual; — Ageing, fatigue and corrosion control programmes; — Non-destructive inspection techniques; — Disassembly and reassembly techniques; — Troubleshooting techniques.	2

MODULE 12L — RADIO COM / ELTs / TRANSPONDERS / INSTRUMENTS

MODULE 12L — RADIO COM / ELTs / TRANSPONDERS / INSTRUMENTS	Level
12L.1 Radio COM / ELTs Fundamentals of radio-wave propagation, antennas, transmission lines, communication,receiver, and transmitter. Working principle of: — Emergency locator transmitters (ELTs); — Very-high-frequency (VHF) communications; — installation and testing of ELTs and VHF radio and antennas.	2
12L.2 Transponder and FLARM — Air traffic control transponder, secondary surveillance radar (basic operation,configuration, modes); — FLARM; — Installation and testing.	2
12L.3 Instruments — Pitot-static: altimeter, airspeed indicator, vertical speed indicator, total energy probes; — Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situationindicator, turn and slip indicator, turn coordinator; — Compasses: direct reading, remote reading; — Angle-of-attack indication, stall-warning systems; — Glass and analogue cockpit; — Indications of other aircraft systems; — Installation and testing of instruments.	2
12L.4 Avionics general test equipment — Operation, function, and use of general test equipment for avionics.	1

Appendix VIII — Basic examination standard for category L aircraft maintenance licence

(a) The standardisation basis for examinations related to the Appendix VII basic knowledge requirements shall be as follows:

(i) all examinations must be carried out using the multiple-choice question format as specified in point (ii). The incorrect alternatives must seem equally plausible to anyone ignorant of the subject. All of the alternatives should be clearly related to the question and of similar vocabulary, grammatical construction and length. In numerical questions, the incorrect answers should correspond to procedural errors such as corrections appliedin the wrong sense or incorrect unit conversions: they must not be mere randomnumbers;

(ii) each multiple-choice question must have three alternative answers of which only one must be the correct answer and the candidate must be allowed a time per module whichis based upon a nominal average of 75 seconds per question;

(iii) the pass mark for each module is 75 %;

(iv) penalty marking (negative points for failed questions) is not to be used;

(v) the level of knowledge required in the questions must be proportionate to the level of technology of the aircraft category.

(vi) a failed module may not be retaken for at least 30 days from the date of the failed module examination;

(vii) the maximum number of attempts for each examination is three in a 12-month period.

(b) The number of questions per module shall be as follows:

Module	No of Questions	Time Allowed (minutes)
2L-Human factors	24	30
3L-Aviation legislation	28	35
4L- Airframe wooden/metal tube and fabric	40	50
5L-Composite Structure	32	40
6L-Metal Structure	32	40
7L-Airframe general mechanical and electrical systems'	60	75
8L-Power plant	64	80
9L--Balloons – hot-air balloons'	36	45
10L- Balloons – gas (free/tethered) balloons'	44	55
11L-Airships hot air/gas airships	40	50
12-Radio Com/ELT/transponder/instruments	20	25

AMC1 Appendix VIII — Basic examination standard for category L aircraft maintenance licence

NUMBER OF QUESTIONS PER SUBMODULE

The tables below show the number of questions recommended for each submodule. Justified deviations from these values are also acceptable, provided that the sum of the questions for the submodules equals the total number for a given module

MODULE 2L — HUMAN FACTORS

MODULE 2L — HUMAN FACTORS		Nr of questions
		24
2L.1	General	3
2L.2	Human performance and limitations	2
2L.3	Social psychology	2
2L.4	Factor that affect performance	4
2L.5	Physical Environment	4
2L.6	The 'The Dirty Dozen' and risk-mitigation	5
2L.7	Workplace safety and environment protection	4

MODULE 3L — AVIATION LEGISLATION

MODULE 3L — AVIATION LEGISLATION		Nr of questions
		28
3L.1	Regulatory framework	4
3L.2	Continuing airworthiness regulations	6
3L.3	Repairs and modifications (CAR-ML)	5
3L.4	Maintenance data (CAR-ML)	5
3L.5	Licence privileges and how to exercise them properly (CAR-66, CAR-ML)	8

MODULE 4L — WOODEN AND/OR METAL-TUBE STRUCTURE COVERED WITH FABRIC

MODULE 4L — WOODEN AND/OR METAL-TUBE STRUCTURE COVERED WITH FABRIC		Nr of questions
		40
4L.1	Combined structures made of wood, metal tube and fabric	8
4L.2	Materials	8
4L.3	Identifying damages and defects	12
4L.4	Standard repair and maintenance procedures	12

MODULE 5L — COMPOSITE STRUCTURE

MODULE 5L — COMPOSITE STRUCTURE	Nr of questions
	32
5L.1 Fibre-reinforced plastic (FRP) airframe	6
5L.2 Materials	6
5L.3 Identifying damages and defects	10
5L.4 Standard repair and maintenance procedures	10

MODULE 6L — METALLIC STRUCTURE

MODULE 6L — METALLIC STRUCTURE	Nr of questions
	32
6L.1 Metallic airframe	6
6L.2 Materials	6
6L.3 Identifying damages and defects	10
6L.4 Standard repair and maintenance procedures	10

MODULE 7L — AIRFRAME: GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS

MODULE 7L — AIRFRAME: GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS	Nr of questions
	60
7L.1 Theory of Flight — gliders and aeroplanes	4
7L.2 Airframe Structure — gliders and aeroplanes	4
7L.3 Air conditioning (ATA 21)	1
7L.4 Electrical power, cables, and connectors (ATA 24)	3
7L.5 Equipment and furnishing (ATA 25)	2
7L.6 Fire protection and other safety systems (ATA 26)	2
7L.7 Flight controls (ATA 27)	3
7L.8 Fuel system (ATA 28) 7L.9 Hydraulic power (ATA 29)	2
7L.9 Hydraulic power (ATA 29)	2
7L.10 Ice and rain protection (ATA 30)7L.11 Landing gear (ATA 32)	1
7L.11 Landing gear (ATA 32)	3
7L.12 Lights (ATA 33)	1
7L.13 Oxygen (ATA 35)	1
7L.14 Pneumatic/vacuum (ATA 36)7L.15 Water ballast (ATA 41)	1
7L.15 Water ballast (ATA 41)	1
7L.16 Fasteners	2
7L.17 Pipes, hoses, and connectors7L.18 Springs	2
7L.18 Springs	1
7L.19 Bearings 7L.20 Transmissions7L.21 Control cables	1
7L.20 Transmissions	2
7L.21 Control cables	3
7L.22 Fits and clearances	1
7L.23 Aircraft weight and balance 7L.24 Workshop practices and tools	2
7L.24 Workshop practices and tools	4
7L.25 Disassembly, inspection, repair, and assembly techniques7L.26 Abnormal events	4

MODULE 7L — AIRFRAME: GENERAL, MECHANICAL AND ELECTRICAL SYSTEMS	Nr of questions
	60
7L.26 Abnormal events	3
7L.27 Maintenance procedures	4

MODULE 8L — POWER PLANT

MODULE 8L — POWER PLANT	Nr of questions
	64
8L.1 Engine fundamentals — general	2
8L.2 Piston-engine fundamentals and performance	2
8L.3 Piston-engine construction	3
8L.4 Piston-engine fuel system (non-electronic)	2
8L.5 Starting and ignition systems	3
8L.6 Air intake, exhaust, and cooling systems	2
8L.7 Supercharging/turbocharging	2
8L.8 Lubrication systems of piston engines	2
8L.9 Engine indication systems	3
8L.10 Electric and hybrid aircraft engines	9
8L.11 Turbine-engine fundamentals and performance	2
8L.12 Inlet and compressor	2
8L.13 Combustion chamber, starting and ignition system	2
8L.14 Turbine section and exhaust	2
8L.15 Other turbine-engine components and systems	2
8L.16 Turbine-engine inspections and ground operation	3
8L.17 Propeller	7
8L.18 Full authority digital engine control (FADEC)	2
8L.19 Lubricants and fuels	3
8L.20 Engine and propeller installation	4
8L.21 Engine monitoring and ground operation	3
8L.22 Engine/propeller storage and preservation	2

Note: In accordance with Appendix VII '1. Modularisation' to CAR 66, Module 8L training subjects forL5 category AMEL and, therefore, the number of questions, should be limited to the relevant propulsion system. As such, in the above table, certain submodules may not be applicable and should not be taken into account, and the total number of questions should also be adapted accordingly.

MODULE 9L — BALLOONS: HOT-AIR BALLOONS

MODULE 9L — BALLOONS: HOT-AIR BALLOONS	Nr of questions
	36
9L.1 Theory of flight — hot-air balloons	2
9L.2 Airframe of hot-air balloons	3
9L.3 Envelope	4

MODULE 9L — BALLOONS: HOT-AIR BALLOONS	Nr of questions
	36
9L.4 Heater system / burner	4
9L.5 Basket and basket suspension (including alternative devices)	4
9L.6 Instruments	5
9L.7 Equipment	2
9L.8 Hot-air balloon handling and storage	4
9L.9 Disassembly, inspection, repair, and assembly techniques	8

MODULE 10L — BALLOONS: GAS (FREE/TETHERED) BALLOONS

MODULE 10L — BALLOONS: GAS (FREE/TETHERED) BALLOONS	Nr of questions
	44
10L.1 Theory of flight of gas balloons	2
10L.2 Airframe of gas balloons	3
10L.3 Envelope	3
10L.4 Netting	1
10L.5 Valves, parachutes, and other related systems	1
10L.6 Load ring	1
10L.7 Basket (including alternative devices)	4
10L.8 Ropes and lines	2
10L.9 Instruments	5
10L.10 Tethered gas balloon (TGB) systems	8
10L.11 Equipment	2
10L.12 Gas-balloon handling and storage	4
10L.13 Disassembly, inspection, repair, and assembly techniques	8

MODULE 11L — AIRSHIPS: HOT-AIR/GAS AIRSHIPS

MODULE 11L — AIRSHIPS: HOT-AIR/GAS AIRSHIPS	Nr of questions
	40
11L.1 Theory of flight and control of airships	3
11L.2 Airship airframe structure — general concepts	3
11L.3 Airship envelope	3
11L.4 Gondola	6
11L.5 Airship flight controls (ATA 27/55)	2
11L.6 Electrical power (ATA 24)	3
11L.7 Lights (ATA 33)	1
11L.8 Ice and rain protection	2
11L.9 Fuel systems (ATA 28)	3
11L.10 Engines and propellers in airships	2
11L.11 Airship handling and storage	4
11L.12 Disassembly, inspection, repair, and assembly techniques	8

MODULE 12L — RADIO COM / ELTs / TRANSPONDERS / INSTRUMENTS

	Nr of

MODULE 12L — RADIO COM / ELTs / TRANSPONDER / INSTRUMENTS	questions
	20
12L.1 Radio COM / ELTs	6
12L.2 Transponder and FLARM	5
12L.3 Instruments	8
12L.4 Avionics general test equipment	1

APPENDICES to AMC for CAR-66

Appendix I
AIRCRAFT TYPE RATINGS
FOR CAR-66 AIRCRAFT MAINTENANCE ENGINEER'S LICENCE

(Published Separately on DGCA Website)

Appendix II to AMC to CAR-66

Aircraft type practical experience and On-the-Job Training list of tasks

1. Aircraft type practical experience

Tasks are divided in categories of aircraft:

A) Aeroplanes
B) Sailplanes and powered sailplanes
C) Balloons and airships

A) SPECIFIC TASKS FOR AEROPLANES AND HELICOPTERS

I Time limits/Maintenance checks (ATA 05)

a. 100 hour check (general aviation aircraft).
b. B or C Check (transport category aircraft)
c. Assist carrying out a scheduled maintenance check i.a.w. AMM
d. Review aircraft maintenance log for correct completion
e. Review records for compliance with airworthiness directives.
f. Review records for compliance with component life limits.
g. Procedure for Inspection following heavy landing.
h. Procedure for Inspection following lightning strike.

II Dimensions/Areas(ATA 06)

a. Locate component(s) by station number.
b. Perform symmetry check.

III Lifting and Shoring(ATA 07)

Assist in :

a. Jack aircraft nose or tail wheel.
b. Jack complete aircraft.
c. Sling or trestle major component.

IV Leveling /Weighing (ATA 08)

a. Level aircraft.
b. Weigh aircraft.
c. Prepare weight and balance amendment.
d. Check aircraft against equipment list.

V Towing and Taxing (ATA 09)

a. Prepare for aircraft towing
b. Tow aircraft
c. Be part of aircraft towing team.

VI Parking and mooring (ATA 10)

a. Tie down aircraft.
b. Park, secure and cover aircraft.
c. Position aircraft in dock.
d. Secure rotor blades.

VII Placards and Marking (ATA11)

a. Check aircraft for correct placards.
b. Check aircraft for correct markings.

VII Servicing (ATA 12)

a. Refuel aircraft.
b. Defuel aircraft
c. Carry out tank to tank fuel transfer
d. Check / adjust tire pressures.
e. Check / replenish oil level.
f. Check/ replenish hydraulic fluid level.
g. Check/ replenish accumulator pressure.
h. Charge pneumatic system.
i. Grease aircraft.
j. Connect ground power.
k. Service toilet/water system
l. Perform pre-flight/daily check

IX Vibration and Noise Analysis (ATA 18)

a. Analyze helicopter vibration problem.
b. Analyze noise spectrum.
c. Analyse engine vibration.

X Air Conditioning (ATA 21)

a. Replace combustion heater.
b. Replace flow control valve.
c. Replace outflow valve.
d. Replace safety valve.
e. Replace vapour cycle unit.
f. Replace air cycle unit.
g. Replace cabin blower.
h. Replace heat exchanger.
i. Replace pressurization controller.
j. Clean outflow valves.
k. Deactivate/reactivate cargo isolation valve.
l. Deactivate/reactivate avionics ventilation components
m. Check operation of air conditioning/heating system
n. Check operation of pressurizationsystem
o. Troubleshoot faulty system

XI Auto flight (ATA 22)

a. Install servos.
b. Rig bridle cables
c. Replace controller. Replace amplifier.
d. Replacement of the auto flight system LRUs in case of fly- by - wireaircraft
e. Check operation of auto-pilot.
f. Check operation of auto-throttle /auto thrust.
g. Check operation of yaw damper.
h. Check and adjust servo clutch.
i. Perform autopilot gain adjustments.
j. Perform mach trim functional check.
k. Troubleshoot faulty system.
l. Check auto land system
m. Check flight management systems
n. Check stability augmentation system

XII Communications (ATA 23)

a. Replace VHF com unit.
b. Replace HF com unit.
c. Replace existing antenna.
d. Replace static discharge wicks.
e. Check operation of radios.
f. Perform antenna VSWR check.
g. Perform Selcal operational check.
h. Perform operational check ofpassenger address system.
i. Functionally check audio integratingsystem.
j. Repair co-axial cable.
k. Troubleshoot faulty system
l. Check SATCOM

XIII Electrical Power (ATA 24)

a. Charge lead/acid battery.
b. Charge Ni-Cd battery.
c. Check battery capacity.
d. Deep-cycle Ni-Cd battery.
e. Replace Integrated drive/generator/alternator.
f. Replace switches.
g. Replace circuit breakers.
h. Adjust voltage regulator.
i. Amend electrical load analysisreport.
j. Repair/replace electrical feedercable.
k. Perform functional check of IDG /Generator / Alternator
l. Perform functional check of voltageregulator.
m. Perform functional check of emergency generation system.
n. Troubleshoot faulty system

XIV Equipment/Furnishings (ATA 25)

a. Replace carpets
b. Replace crew seats.
c. Replace passenger seats.
d. Check inertia reels.
e. Check seats/belts for security.
f. Check emergency equipment.
g. Check ELT for compliance withregulations.
h. Repair toilet waste container.
i. Repair upholstery.
j. Change cabin configuration.
k. Replace escape slides/ropes
l. Replace cargo loading systemactuator.
m. Test cargo loading system
n. Remove and install ceiling and sidewall panels

XV Fire protection (ATA 26)

a. Check fire bottle contents.
b. Check / test operation of fire /smoke detection and warning system.
c. Check cabin fire extinguishercontents.
d. Check lavatory smoke detectorsystem.
e. Check cargo panel sealing.
f. Install new fire bottle.
g. Replace fire bottle squib.
h. Troubleshoot faulty system.
i. Inspect engine fire wire detectionsystems.

XVI Flight Controls (ATA 27)

a. Inspect primary flight controls and related components i.a.w. AMM.
b. Extending/retracting flaps & slats.
c. Replace horizontal stabilizer.
d. Replace spoiler/lift damper.
e. Replace elevator.
f. Deactivation/reactivation of aileron servo control.
g. Replace aileron.
h. Replace rudder.
i. Replace trim tabs.
j. Install control cable and fittings.
k. Replace slats.
l. Replace flaps.
m. Replace powered flying control unit.
n. Replace flap actuator
o. Adjust trim tab.
p. Adjust control cable tension.
q. Check control range and direction ofmovement.
r. Check for correct assembly and locking.
s. Troubleshoot faulty system.
t. Functional test of primary flight controls.
u. Functional test of flap system.
v. Operational test of the side stick assembly.
w. Operational test of the THS.
x. THS system wear check.

XVII Fuel (ATA 28)

a. Water drain system (operation).
b. Replace booster pump.
c. Replace fuel selector.
d. Replace fuel tank cells.
e. Replace/test fuel control valves.
f. Replace magnetic fuel level indicators.
g. Replace water drain valve.
h. Check filters.
i. Flow check system.
j. Check calibration of fuel quantity gauges.
k. Check operation feed/selectors
l. Check operation of fueldump/jettison system.
m. Fuel transfer between tanks.
n. Pressure defuel. Pressure refuel(manual control).
o. Troubleshoot faulty system.
p. Deactivation/reactivation of the fuel valves (transfer defuel, X-feed, refuel).
q. Check/calculate fuel contents manually.

XVIII Hydraulics (ATA 29)

a. Replace engine driven pump.
b. Check/replace case drain filter.
c. Replace hydraulic motorpump/generator.
d. Replace standby pump.
e. Replace accumulator.
f. Check operation of shut off valve.
g. Check filters / Clog indicators.
h. Check indicating systems.
i. Perform functional checks.
j. Pressurisation/depressurisation ofthe hydraulic system.
k. Power Transfer Unit (PTU)operation
l. Replacement of PTU.
m. Troubleshoot faulty system.

XIX Ice and rain protection (ATA 30) Replace pump.

a. Replace timer.
b. Inspect repair propeller deice boot.
c. Test propeller de-icing system.
d. Inspect/test wing leading edge de- icer boot.
e. Replace anti-ice/deice valve.
f. Install wiper motor.
g. Check operation of systems.
h. Operational test of the pitot-probe ice protection.
i. Operational test of the TAT ice protection.
j. Operational test of the wing ice protection system.
k. Assistance to the operational test of the engine air-intake ice protection (with engines operating)
l. Troubleshoot faulty system.

XX Indicating/recording systems (ATA 31)

a. Replace flight data recorder.
b. Replace cockpit voice recorder.
c. Replace clock.
d. Replace master caution unit.
e. Replace FDR.
f. Perform FDR data retrieval.
g. Troubleshoot faulty system.
h. Implement ESDS procedures
i. Inspect for HIRF requirements
j. Start/stop EIS procedure.
k. Bite test of the CFDIU.
l. Ground scanning of the central warning system.

XXI Landing Gear (ATA 32)

a. Build up wheel.
b. Replace main wheel.
c. Replace nose wheel.
d. Replace steering actuator.
e. Replace truck tilt actuator.
f. Replace gear retraction actuator.
g. Replace uplock/downlock assembly.
h. Replace shimmy damper.
i. Rig nose wheel steering.
j. Replace shock strut seals.
k. Servicing of shock strut.
l. Replace brake unit.
m. Replace brake control valve.
n. Bleed brakes.
o. Replace brake fan.
p. Test anti-skid unit.
q. Test gear retraction.
r. Change bungees.
s. Adjust micro switches/sensors.
t. Charge struts with oil and air.
u. Troubleshoot faulty system.
v. Test auto-brake system.
w. Replace rotorcraft skids.
x. Replace rotorcraft skid shoes.
y. Pack and check floats.
z. Flotation equipment.
aa. Check/test emergency blowdown (emergency landing gear extension).
bb. Operational test of the landing gear doors.

XXII Lights (ATA 33)

a. Repair/replace rotating beacon.
b. Repair/replace landing lights.
c. Repair/replace navigation lights.
d. Repair/replace interior lights.
e. Replace ice inspection lights.
f. Repair/replace logo lights.
g. Repair/replace emergency lighting system.
h. Perform emergency lighting system checks.
i. Troubleshoot faulty system

Instruments

a. Troubleshoot faulty system.
b. Calibrate magnetic direction indicator.
c. Replace airspeed indicator.
d. Replace altimeter.
e. Replace air-data computer.
f. Replace ADI.
g. Replace HSI.
h. Check pitot static system for leaks.
i. Check operation of directional gyro.
j. Check calibration of pitot static instruments.
k. Compass replacement direct/indirect.
l. Functional check flight director system

Surveillance

a. Troubleshoot faulty system.
b. Functional check weather radar.
c. Functional check doppler.
d. Functional check TCAS.
e. Functional check ATC transponder.
f. Check calibration of pressure altitude reporting system.

XXIII Navigation (ATA 34)

a. Functional check inertial navigation system.
b. Complete quadrantal error correction of ADF system.
c. Check GPS.
d. Test AVM.
e. Check marker systems.
f. Functional check DME.

XXIV Oxygen (ATA 35)

a. Inspect on board oxygen equipment.
b. Purge and recharge oxygen system.
c. Replace regulator.
d. Replace oxygen generator.
e. Test crew oxygen system.
f. Perform auto oxygen system deployment check.
g. Troubleshoot faulty system.

XXV Pneumatic systems (ATA 36)

a. Replace filter.
b. Replace air shut off valve.
c. Replace pressure regulating valve.
d. Replace compressor.
e. Recharge dessicators.
f. Adjust regulator.
g. Check for leaks.
h. Troubleshoot faulty system.

XXVI Vacuum systems (ATA 37)

a. Inspect the vacuum system i.a.w. AMM.
b. Replace vacuum pump.
c. Check/replace filters.
d. Adjust regulator.
e. Troubleshoot faulty system.

XXVII Water/Waste (ATA 38)

a. Replace water pump.
b. Replace tap.
c. Replace toilet pump.
d. Perform water heater functional check.
e. Troubleshoot faulty system.
f. Inspect waste bin flap closure.

XXVIII Central Maintenance System (ATA 45)

a. Retrieve data from CMU.
b. Replace CMU.
c. Perform Bite check.
d. Troubleshoot faulty system.

XXIX Airborne Auxiliary power (ATA 49)

a. Removal /Installation of APU.
b. Removal/installation of the inlet guide-vane actuator.
c. Operational test of the APU emergency shut-down test.
d. Operational test of APU.

XXX Structures (ATA 51)

a. Assessment of damage.

a. Sheet metal repair.
b. Fibre glass repair.
c. Wooden repair.

b. Fabric repair (ATA 51)

a. Recover fabric control surface.
b. Treat corrosion.
c. Apply protective treatment.

XXXI Doors (ATA 52)

a. Inspect passenger door i.a.w. AMM.
b. Rig/adjust locking mechanism.
c. Adjust air stair system.
d. Check operation of emergency exits.
e. Test door warning system.
f. Troubleshoot faulty system.
g. Remove and install passenger door i.a.w. AMM.
h. Remove and install emergency exit i.a.w. AMM.
i. Inspect cargo door i.a.w. AMM.

XXXII Windows (ATA 56)

a. Replace windshield.
b. Replace direct vision window.
c. Replace cabin window
d. Repair transparency.

XXXIII Wings (ATA 57)

a. Skin repair.
b. Recover fabric wing.
c. Replace tip.
d. Replace rib.
e. Replace integral fuel tank panel.
f. Check incidence/rig.

XXXIV Propeller (ATA 61)

a. Assemble prop after transportation.
b. Replace propeller.
c. Replace governor.
d. Adjust governor.
e. Perform static functional checks.
f. Check operation during ground run.
g. Check track.
h. Check setting of micro switches.
i. Dress out blade damage.
j. Dynamically balance prop.
k. Troubleshoot faulty system.

XXXV Main Rotors (ATA 62)

a. Replace blades.
b. Replace damper assembly.
c. Check track.
d. Check static balance.
e. Check dynamic balance.
f. Troubleshoot.

XXXVI Rotor Drive (ATA 63)

a. Replace mast.
b. Replace drive coupling.
c. Replace clutch/freewheel unit
d. Replace drive belt.
e. Install main gearbox.
f. Overhaul main gearbox.
g. Check gearbox chip detectors.

XXXVII Tail Rotors (ATA 64)

a. Install rotor assembly.
b. Replace blades.
c. Troubleshoot.

XXXVIII Tail Rotor Drive (ATA 65)

a. Replace bevel gearbox.
b. Replace universal joints.
c. Overhaul bevel gearbox.
d. Install drive assembly.
e. Check chip detectors.
f. Check/install bearings and hangers.
g. Check/service/assemble flexiblecouplings.
h. Check alignment of drive shafts.
i. Install and rig drive shafts.

XXXIX Rotorcraft flight controls (ATA 67)

a. Install swash plate.
b. Install mixing box.
c. Adjust pitch links.
d. Rig collective system.
e. Rig cyclic system.
f. Rig anti-torque system.
g. Check controls for assembly and locking.
h. Check controls for operation and sense.
i. Troubleshoot faulty system.

XL Power Plant (ATA 71)

a. Build up ECU.
b. Replace engine.
c. Repair cooling baffles.
d. Repair cowling.
e. Adjust cowl flaps.
f. Repair faulty wiring.
g. Troubleshoot.
h. Assist in dry motoring check.
i. Assist in wet motoring check.
j. Assist in engine start (manual mode).

XLI Piston Engines (ATA 72)

a. Remove/install reduction gear.
b. Check crankshaft run-out.
c. Check tappet clearance.
d. Check compression.
e. Extract broken stud.
f. Install helicoil.
g. Perform ground run.
h. Establish/check reference RPM.
i. Troubleshoot.

XLII Turbine Engines (ATA 72)

a. Replace module.
b. Replace fan blade.
c. Hot section inspection/borescope check.
d. Carry out engine/compressor wash.
e. Carry out engine dry cycle.
f. Engine ground run.
g. Establish reference power.
h. Trend monitoring/gas path analysis.
i. Troubleshoot.

XLIII Fuel and control, piston (ATA 73)

a. Replace engine driven pump.
b. Adjust AMC.
c. Adjust ABC.
d. Install carburetor/injector.
e. Adjust carburetor/injector.
f. Clean injector nozzles.
g. Replace primer line.
h. Check carburetor float setting.

XLIV Fuel and control, turbine (ATA 73)

a. Replace FCU.
b. Replace engine electronic controlunit (FADEC).
c. Replace fuel metering unit (FADEC).
d. Replace engine driven pump.
e. Clean/test fuel nozzles.
f. Clean/replace filters.
g. Adjust FCU.
h. Troubleshoot faulty system.
i. Functional test of FADEC.

XLV Ignition systems, piston (ATA 74)

a. Change magneto.
b. Change ignition vibrator.
c. Change plugs.
d. Test plugs.
e. Check H.T. leads.
f. Install new leads.
g. Check timing.
h. Check system bonding.
i. Troubleshoot faulty system.

XLVI Ignition systems, turbine (ATA 74)

a. Perform functional test of theignition system.
b. Check glow plugs/ ignitors.
c. Check H.T. leads.
d. Check ignition unit.
e. Replace ignition unit.
f. Troubleshoot faulty system.

XLVII Engine Controls(ATA 76)

a. Rig thrust lever.
b. Rig RPM control.
c. Rig mixture HP cock lever.
d. Rig power lever.
e. Check control sync (multi-eng).
f. Check controls for correct assemblyand locking.
g. Check controls for range anddirection of movement.

Adjust pedestal micro-switches.

h. Troubleshoot faulty system.

XLVIII Engine Indicating (ATA 77)

a. Replace engine instruments(s).
b. Replace oil temperature bulb.
c. Replace thermocouples.
d. Check calibration.
e. Troubleshoot faulty system.

XLIX Exhaust, piston (ATA 78)

a. Replace exhaust gasket.
b. Inspect welded repair.
c. Pressure check cabin heater muff.
Troubleshoot faulty system.

L Exhaust, turbine (ATA 78)

a. Change jet pipe.
b. Change shroud assembly.
c. Install trimmers.
d. Inspect/replace thrust reverser.
e. Replace thrust reverser component.
f. Deactivate/reactivate thrust reverser.
g. Operational test of the thrust reverser system.

LI Oil (ATA 79)

a. Change oil.
b. Check filter(s).
c. Adjust pressure relief valve.
d. Replace oil tank.
e. Replace oil pump.
f. Replace oil cooler.
g. Replace firewall shut off valve.
h. Perform oil dilution.
i. Troubleshoot faulty system.

LII Starting (ATA 80)

a. Replace starter.
b. Replace start relay.
c. Replace start control valve.
d. Check cranking speed.
e. Troubleshoot faulty system.

LIII Turbines, piston engines (ATA 70)

a. Replace PRT.
b. Replace turbo-blower.
c. Replace heat shields.
d. Replace waste gate.
e. Adjust density controller.

LIV Engine water injection (ATA 82)

a. Replace water/methanol pump.
b. Flow check water/methanol system.
c. Adjust water/methanol control unit.
d. Check fluid for quality.
e. Troubleshoot faulty system

LV Accessory gear boxes (ATA 83)

a. Replace gearbox.

Replace drive shaft.

b. Check Chip detector

B. SPECIFIC TASKS FOR SAILPLANES AND POWERED SAILPLANES

Structures	Wooden/metal tube and fabric/composite/metallic
General activities	
Placards check or replace	x
Weighing, weight & balance sheet	x
Documentation of annual inspection, repair	x
Review records for compliance with airworthiness directives	x
Five annual inspections	x
Inspection after an occurrence	x
Dismantling/reinstallation of wings and empennages	x
Leveling and weighing	
Level the sailplane	x
Weighing, weight & balance sheet	x
Prepare a weight and balance amendment	x
Check the list of equipment	x
Flight controls and flight control systems	
Aileron, flaps: Removal — Balancing — Reinstallation	x
Elevator: Removal — Balancing — Reinstallation	x
Rudder: Removal — Balancing — Reinstallation	x
Rudder cable: Fabrication and installation	x
Elevator pushrod: Installation	x
Safeguarding of pins, screws, castellated nuts	x
Sealing of gaps	x
Electrical systems	
Electrical components, wiring: Removal — Installation	x
Batteries — Servicing	x
Avionics systems	
COM: Removal — Installation	x
NAV: Removal — Installation	x
XPDR: Removal — Installation	x
Antenna/antenna cable: Removal — Installation	x
Cabin equipment/systems	
Belts/safety harnesses: Removal — Installation	x
Oxygen system removal installation — Test	x
Canopy replacement or repair	x
Pitot/static system: Removal — Installation — Test	x
Flight instruments: Removal — Installation	x
Installation of approved equipment	x
Compass: Installation — Compensation	x
Tow release: Removal — Installation	x

Structures	Wooden/metal tube and fabric/composite/metallic
Water ballast system: Removal — Installation — Test	x
Undercarriage: Removal — Installation	x
Brake system: Replacement of components	x
Fuel — Engine — Propeller — Engine — Instruments	x
Refer to the tasks related to propeller, piston engine, fuel and control, ignition, engine indications and exhaust, which are contained in Table A 'Specific tasks for aeroplanes'	
Verification and adjustment of folding system of powered sailplanes	x
Wooden structures/Metal tubes and fabric	
Inspection/testing for damages	x
Rib structure repair	x
Plywood skin repair	x
Recover or repair structure with fabric	x
Protective coating and finishing	x
Install patch on fabric material	x
Repair of fairings	x
Composite structures	
Laminate repair	x
Sandwich structure repair	x
Partial gel coat repair	x
Complete gel coating	x
Repair of fairings	x
Metal structures	
Crack testing	x
Repair of covering	x
Drilling cracks	x
Riveting jobs	x
Bonding of structures	x
Anti-corrosion treatment	x
Repair of fairings	x

C. SPECIFIC TASKS FOR BALLOONS AND AIRSHIPS

Tasks	Balloon		Airship	
	Hot air	Gas (Free/ Tethered)	Hot air	Gas
General activities:				
Functionality test of aircraft (*)	x	x	x	x
Placards check or replace	x	x	x	x

Tasks	Balloon		Airship	
	Hot air	Gas (Free/ Tethered)	Hot air	Gas
Documentation annual inspection, repair, ADs, equipment (*)	x	x	x	x
Classification repair (*)	x	x	x	x
Weighing:				
Weighing and weighing report (*)	x	x	x	x
Servicing:				
Lubrication of controls when applicable		x	x	x
Cleaning envelope, basket, burner	x	x	x	x
Inspections:				
Eight annual inspections (covering at least 3 different types) (*)	x			
Five annual inspections (covering at least 2 different types) (*)		x (Free)		
Three annual inspections (covering at least 2 different types) (*)		x (tethered)	x	
Two annual inspections (*)				x
Strength test of envelope fabric (*)	x	x	x	x
Flight control systems — Removal — Inspection — Reinstallation				
Control surface cable				x
Trim system				x
Safeguarding of pins, screws, castellated nuts (*)		x (tethered)	x	x
Stick and pedals				x
Hydromechanical control systems		x (tethered)		x
Ballonet control systems (*)		x (tethered)	x	x
Electrical control systems		x (tethered)		x
Valves (gas valve, turning vent, parachute or rip panel) (*)	x	x	x	x
Control and shroud lines and pulleys	x	x	x	x
Elevator – stabilizer (incl. balancing if applicable)				x
Rudder (incl. balancing if applicable)				x
Drag rope		x (Free)		
Electrical system:				
Removal – installation of electrical wires		x (tethered)	x	x
Removal – installation of electrical components		x (tethered)	x	x
Servicing of batteries	x	x	x	x
Communication system – Transponder:				

Tasks	Balloon		Airship	
	Hot air	Gas (Free/ Tethered)	Hot air	Gas
Removal – installation of COM	x	x	x	x
Removal – installation of NAV				x
Removal – installation of XPDR	x	x	x	x
Installation of antenna	x	x	x	x
Replacement of antenna cable	x	x	x	x
Cabin – Equipments:				
Pitot / static systems – tubes removal - installation - replacement				x
Flight instruments removal - installation - replacement	x	x	x	x
Installation of an approved system	x	x	x	x
Magnetic compass installation - compensation				x
Fire extinguisher	x		x	x
Ballast - Replacement of:				
Water ballast (when applicable)				x
Sand/shot ballast (when applicable)		x		x
Valves - inspection and rigging of valves				x
Envelope:				
Inspection and repair of envelope panels/gores/seams	x	x	x	x
Inspection and repair of load tapes and attachment points	x	x	x	x
Inspection and repair of deflation system	x	x	x	
Inspection and repair of net		x		
Inspection and repair of mooring system		x(tethered)		
Electrostatic conductivity test (if type is approved for hydrogen) (*)		x		x
Ballonet inspection and repair		x		x
Inspection and fabrication of a suspension cable or rope	x	x	x	x
Inspection and fabrication of a catena			x	x
Load ring/frame:				
Crack detection (welded and machined parts)(*)	x	x	x	
Heater system:				
Removal, inspection and re-installation	x		x	
Inspection and cleaning of vaporizer and filter(*)	x		x	

Tasks	Balloon		Airship	
	Hot air	Gas (Free/ Tethered)	Hot air	Gas
Inspection and replacement of hoses (*)	x		x	
Inspection and replacement of pilot flame ignition unit (*)	x		x	
Sealing of fittings (*)	x		x	
Pressure and leak test (*)	x		x	
Disassembly an assembly of fuel cell (*)	x		x	
10-year inspection of fuel cell	x		x	
Basket/gondola:				
Removal, inspection and re-installation (as applicable)	x	x	x	x
Inspection and fabrication of a suspension cable or rope (*)	x	x		
Removal – installation of padding	x	x		
Removal – installation of belts - safety harness			x	x
Removal – installation of essential elements of the cabin	x	x	x	x
Inspection and fabrication of a basket wire	x	x		
Inspection of operational equipment and its fixation points	x	x	x	x
Crack detection and repair (welded parts and frames)	x	x	x	x
Landing gear:				
Removal, inspection and re-installation of wheels		x(tethered)	x	x
Removal, inspection and re-installation of brakes				x
Removal, inspection and re-installation of shock absorber				x
Fuel – Engine – Propeller – Engine instruments systems:				
Refer to tasks in blocks for aeroplanes			x	x
Wood structure:				
Structure repair	x	x		
Protective coating				
Composite structure:				
Laminate repair		x(tethered)		x
Sandwich structure repair		x(tethered)		x
Metal structures:				
Crack detection (welded and machined parts)	x	x	x	x

Tasks	Balloon		Airship	
	Hot air	Gas (Free/ Tethered)	Hot air	Gas
Riveting jobs			x	x
Bonding of structures		x	x	x
Anti-corrosion treatment		x(tethered)	x	x
Repair of fairings		x(tethered)		x
Engine:				
Tasks for aeroplanes of comparable certification level			x	x
Exhaust system:				
Tasks for aeroplanes of comparable certification level			x	x
Propeller:				
Tasks for aeroplanes of comparable certification level			x	x
Fuel system:				
Tasks for aeroplanes of comparable certification level			x	x
Hydraulic system:				
Tasks for aeroplanes of comparable certification level			x	x
Pneumatic system:				
Tasks for aeroplanes of comparable certification level			x	x
Winch system:				
Witness winch inspection		x(tethered)		

2. List of tasks for OJT

The minimum list of tasks should be selected from the table below according to the following procedures and criteria:

i) Filter the ATA chapters (or sub-chapters, when required) applicable to the specific aircraft type (add others if they are missing).

ii) Identify relevant and significant tasks for each required category of INS, FOT, SGH, R/I, MEL and TS.

iii) Retain the required percentage for each task category, and throughout ATA chapters, as much as relevant to the particular aircraft type.

The selection of tasks should give precedence to tasks which are critical and complex in terms of:

- difficulty to execute;
- interpretation of the maintenance procedures / work instructions;
- specific tools and equipment;
- coordination among maintenance staff (teamwork);
- human factors (accessibility, human machine interface (HMI), etc.);
- safety impact on the aircraft and the crew.

Removal and installation tasks include the final confirmation test, if required.

Credit may be given for similar tasks between ATA systems (e.g. pneumatic valves in ATA 21, 30 and 36), but this should be kept to a minimum.

Some tasks may be performed on another aircraft type as long as both the system and the task are similar. The following table provides an acceptable method of selection of OJT tasks for B1 and B2 AMEL categories, per ATA chapter or sub-chapters, as required by point 6.2(e) of Appendix III to CAR 66.

OJT TASK SELECTION												
ATA Chapters	**B1**						**B2**					
	INS	**FOT**	**SGH**	**R/I**	**MEL**	**TS**	**INS**	**FOT**	**SGH**	**R/I**	**MEL**	**TS**
Requirements: % of task categories	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**
Introduction subjects:												
05 Time limits / maintenance checks (see *Note* below)	X	—	—	—	—	—	X	—	—	—	—	—
06 Dimensions/ areas	X	—	—	—	—	—	X	—	—	—	—	—
07 Lifting and shoring	X	—	—	—	—	—	X	—	—	—	—	—
08 Levelling and weighing	—	—	X	—	—	—	X	—	X	—	—	—
09 Towing and taxiing	—	—	X	—	—	—	—	—	X	—	—	—
10 Parking/mooring, storing and return to service	—	—	X	—	—	—	—	—	X	—	—	—
11 Placards and markings	X	—	—	—	—	—	X	—	—	—	—	—
12 Servicing	—	—	X	—	—	—	—	—	X	—	—	—
20 Standard practices — only type particular (ATA 50 or 60)	X	—	X	—	—	—	X	—	X	—	—	—
Rotorcraft (only)												
18 Vibration and noise analysis (blade tracking)	—	—	—	—	—	X	—	—	—	—	—	—
62 Rotors												
62-10 Rotor blades	X	—	—	X	—	—	—	—	—	—	—	—
62-20 Rotor head(s)	X	—	—	X	—	—	—	—	—	—	—	—

OJT TASK SELECTION												
ATA Chapters	**B1**						**B2**					
	INS	**FOT**	**SGH**	**R/I**	**MEL**	**TS**	**INS**	**FOT**	**SGH**	**R/I**	**MEL**	**TS**
Requirements: % of task categories	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**
62-30 Rotor shaft(s) / swashplate assy(s)	X	—	—	X	—	—	—	—	—	—	—	—
62-40 Indicating	—	X	X	—	X	X	—	—	—	—	—	X
63 Rotor drives												
63-10 Engine/gearbox couplings	X	—	X	X	—	—	—	—	—	—	—	—
63-20 Gearbox(es)	X	—	X	X	—	—	—	—	—	—	—	—
63-30 Mounts, attachments	X	—	X	—	—	—	—	—	—	—	—	—
63-40 Indicating	—	X	—	—	X	X	—	—	—	—	—	X
63-50 Rotor brake	X	—	—	X	—	—	—	—	—	—	—	—
63-60 Drain lines	X	—	—	—	—	—	—	—	—	—	—	—
64 Tail rotor												
64-10 Rotor blades	X	—	X	X	—	—	—	—	—	—	—	—
64-20 Rotor head	X	—	—	X	—	—	—	—	—	—	—	—
64-40 Indicating	—	X	—	X	X	X	—	—	—	—	—	X
65 Tail-rotor drive												
65-10 Shafts	X	—	X	X	—	—	—	—	—	—	—	—
65-20 Gearboxes	X	—	X	X	—	—	—	—	—	—	—	—
65-40 Indicating	—	X	—	—	X	X	—	—	—	—	—	X
66 Folding blades /pylon												
66-10 Rotor blades	X	—	—	X	—	—	—	—	—	—	—	—
66-20 Tail pylon	X	—	—	—	—	—	—	—	—	—	—	—
66-30 Controls and indicating	—	X	—	—	—	X	—	—	—	—	—	X
67 Rotors flight control												
67-10 Rotor	X	—	—	—	—	—	—	—	—	—	—	—
67-20 Antitorque rotor control (yaw control)	X	—	—	—	—	X	—	—	—	—	—	—
67-30 Servocontrol system	X	—	—	—	—	X	—	—	—	—	—	—
Airframe systems: **21 Air conditioning**												

OJT TASK SELECTION												
ATA Chapters	**B1**						**B2**					
	INS	**FOT**	**SGH**	**R/I**	**MEL**	**TS**	**INS**	**FOT**	**SGH**	**R/I**	**MEL**	**TS**
Requirements: % of task categories	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**
21-10 Compression	—	—	X	X	—	X	—	—	—	—	—	—
21-20 Distribution	—	X	—	X	—	—	—	—	—	—	—	—
21-30 Pressurisation control	—	X	—	X	—	X	—	—	—	—	—	—
21-40 Heating	—	—	—	X	—	—	—	—	—	—	—	—
21-50 Cooling	—	—	—	X	—	—	—	—	—	—	—	—
21-60 Temperature control	—	X	—	X	—	X	—	—	—	—	—	—
22 Autoflight												
22-10 Autopilot	—	—	—	—	—	—	—	X	X	X	X	X
22-20 Speed attitude correction	—	—	—	—	—	—	—	X	—	—	—	X
22-30 Autothrottle	—	X	—	—	—	—	X	X	—	X	—	X
22-40 System monitor	—	—	—	—	—	—	—	X	—	—	—	X
22-50 Aerodynamic load alleviating	—	—	—	—	—	—	—	X	—	—	—	X
23 Communications												
23-10 Speech communications	—	X	—	—	—	—	—	X	—	X	—	X
23-15 SATCOM	—	X	—	—	—	—	X	X	—	X	—	X
23-20 Data transmission and automatic calling	—	X	—	—	—	—	—	X	—	X	—	X
23-30 Passenger address, entertainment and comfort	—	X	—	—	—	—	X	—	—	X	—	X
23-40 Interphone	—	X	—	—	—	—	X	—	—	X	—	X
23-50 Audio integrating	—	X	—	—	—	—	—	X	—	X	—	X
23-60 Static discharging	X	—	—	—	X	—	X	—	—	X	X	X
23-70 Audio and video monitoring	—	X	—	—	—	—	X	X	—	X	—	X
23-80 Integrated automatic tuning	—	—	—	—	—	—	—	X	—	X	—	X
24 Electrical power												
24-10 Generator drive	X	X	X	X	X	X	X	X	—	—	X	X

OJT TASK SELECTION												
ATA Chapters	**B1**						**B2**					
	INS	**FOT**	**SGH**	**R/I**	**MEL**	**TS**	**INS**	**FOT**	**SGH**	**R/I**	**MEL**	**TS**
Requirements: % of task categories	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**
24-20 AC Generation	—	X	—	—	—	X	X	X	—	—	X	X
24-30 DC generation	—	X	—	X	—	X	X	X	—	X	X	X
24-40 External power	X	—	X	—	—	—	X	X	X	—	X	X
24-50 AC electrical load distribution	—	X	—	—	—	X	X	X	—	—	—	X
24-60 DC Electrical load distribution	—	X	—	—	—	X	X	X	—	—	—	X
25 Equipment andfurnishings												
25-10 Flight compartment	X	X	X	X	X	—	X	X	—	—	—	—
25-20 Passenger compartment	X	—	—	X	—	—	—	—	—	—	—	—
25-30 Galley	X	X	—	X	—	—	X	X	—	—	—	—
25-40 Lavatories	X	X	—	—	—	—	X	—	—	—	—	—
25-50 Additional compartments	X	X	—	—	—	—	—	—	—	—	—	—
50-00 Cargo accessory compartment	X	—	—	—	—	—	—	—	—	—	—	—
50-10 Cargo compartments	X	—	—	—	—	—	—	—	—	—	—	—
50-20 Cargo loading systems	X	X	—	—	—	X	—	X	—	—	—	X
50-30 Cargo-related systems	X	—	—	—	—	—	—	—	—	—	—	—
50-50 Accessory	X	—	—	—	—	—	—	—	—	—	—	—
50-60 Insulation	X	—	—	—	—	—	—	—	—	—	—	—
25-60 Emergency	X	X	X	X	—	—	X	X	—	—	—	—
26 Fire protection												
26-10 Detection	—	X	-	X	—	X	—	X	—	—	—	X
26-20 Extinguishing	—	X	X	X	—	—	—	—	—	—	—	—
26-30 Explosion suppression	X	—	—	—	—	—	—	—	—	—	—	—
27 Flight controls												
27-10 Aileron and tab	X	X	—	X	—	X	—	X	—	—	—	—
27-20 Rudder and tab	X	X	—	X	—	X	—	X	—	—	—	—
27-30 Elevator and	X	X	—	X	—	X	—	X	—	—	—	—

OJT TASK SELECTION												
ATA Chapters	**B1**						**B2**					
	INS	**FOT**	**SGH**	**R/I**	**MEL**	**TS**	**INS**	**FOT**	**SGH**	**R/I**	**MEL**	**TS**
Requirements: % of task categories	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**
tab												
27-40 Horizontal stabiliser	X	X	—	X	—	X	—	X	—	—	—	—
27-50 Flaps	X	X	—	X	—	X	—	X	—	—	—	—
27-60 Spoiler, drag devices and variable aerodynamic fairings	X	X	—	X	—	X	—	X	—	—	—	—
27-70 Gust lock and dampener	X	X	X	X	—	X	—	X	—	—	—	—
27-80 Lift augmenting	—	X	X	X	—	X	—	X	—	—	—	—
28 Fuel systems												
28-10 Storage	X	—	X	X	X	—	—	—	X	—	—	—
28-20 Distribution	—	—	—	X	—	—	—	X	—	—	—	—
28-30 Dump	X	—	—	—	—	—	—	-		—	—	—
28-40 Indicating	—	X	—	—	—	X	X	X	—	—	—	X
47-00 Nitrogen generation system	X	X	X	X	X	X	—	X	—	—	—	—
29 Hydraulic power												
29-10 Main	X	X	X	X	—	—	—	X	—	—	—	—
29-20 Auxiliary	—	X	X	X	—	—	—	X	—	—	—	—
29-30 Indicating	—	X	—	X	—	X	—	X	—	—	—	X
30 Ice and rain protection												
30-10 Aerofoil	X	X	—	X	—	—	—	—	—	—	—	—
30-20 Air intakes	X	X	—	—	—	—	—	—	—	—	—	—
30-30 Pitot and static	X	—	—	X	—	—	X	X	—	—	—	X
30-40 Windows, windshields and doors	—	X	—	X	—	—	—	X	—	—	—	X
30-50 Antennas and radomes	X	—	—	X	—	—	X	X	—	—	—	X
30-60 Propellers/rotors	X	—	—	—	—	—	—	—	—	—	—	—
30-70 Water lines	X	—	—	—	—	—	X	—	—	—	—	—
30-80 Detection	—	X	—	X	—	X	—	X	—	—	—	X
31 Indicating/recording systems												
31-10 Instrument and control panels	—	X	—	X	—	—	—	X	—	X	X	X

OJT TASK SELECTION												
ATA Chapters	**B1**						**B2**					
	INS	**FOT**	**SGH**	**R/I**	**MEL**	**TS**	**INS**	**FOT**	**SGH**	**R/I**	**MEL**	**TS**
Requirements: % of task categories	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**
31-20 Independent instruments	—	X	—	—	—	—	—	X	—	X	—	X
31-30 Recorders	—	X	—	—	—	—	—	X	X	X	—	—
31-40 Central computers	—	—	—	—	—	—	—	X	—	X	—	X
31-50 Central warning systems	—	X	—	—	—	—	—	X	—	X	X	X
31-60 Central display systems	—	X	—	—	—	—	—	X	—	X	—	X
31-70 Automatic data reporting systems	—	—	—	—	—	—	—	X	X	X	—	X
32 Landing gear												
32-10 Main gear and doors	X	X	X	X	—	—	—	—	—	—	—	—
32-20 Nose gear and doors	X	X	X	X	—	—	—	—	—	—	—	—
32-30 Extension and retraction	X	X	—	X	—	X	—	—	—	—	—	—
32-40 Wheels and brakes	X	—	X	X	—	—	—	—	—	—	—	—
32-50 Steering	X	X	X	X	—	X	—	—	—	—	—	—
32-60 Position indication and warning	—	X	—	X	—	X	X	X	—	X	—	X
32-70 Supplementary gear	X	X	X	X	—	—	—	—	—	—	—	—
33 Lights												
33-10 Flight compartment	X	X	—	X	—	—	X	X	—	X	—	X
33-20 Passenger compartment	X	X	—	X	—	—	X	X	—	X	—	X
33-30 Cargo and service compartments	X	X	—	—	—	—	X	X	—	—	—	X
33-40 Exterior	X	X	—	X	—	—	X	X	—	—	—	X
33-50 Emergency lighting	X	—	—	X	—	—	X	X	—	X	—	X
34 Navigation												
34-10 Flight environment data	—	X	—	—	—	—	—	X	—	—	—	X
34-20 Attitude and direction	—	X	—	—	—	—	—	X	—	X	X	X

OJT TASK SELECTION												
ATA Chapters	**B1**						**B2**					
	INS	**FOT**	**SGH**	**R/I**	**MEL**	**TS**	**INS**	**FOT**	**SGH**	**R/I**	**MEL**	**TS**
Requirements: % of task categories	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**
34-30 Landing and taxiing aids	—	—	—	—	—	—	—	X	—	X	X	X
34-40 Independent position determining	—	X	—	—	—	—	—	X	—	X	X	X
34-50 Dependent position determining	—	—	—	—	—	—	—	X	—	X	X	X
34-60 Flight management computing	—	X	—	—	—	—	—	X	X	X	X	X
35 Oxygen												
35-10 Crew	X	X	X	X	—	X	—	—	—	—	—	—
35-20 Passengers	X	X	—	X	—	—	—	—	—	—	—	—
35-30 Portable	X	—	—	—	—	—	—	—	—	—	—	—
36 Pneumatic												
36-10 Distribution	X	X	—	X	—	X	—	X	—	—	—	—
36-20 Indicating	—	X	—	X	—	X	X	X	—	—	—	X
37 Vacuum												
37-10 Distribution	—	X	—	X	—	X	—	—	—	—	—	—
37-20 Indicating	—	X	—	X	—	X	—	X	—	—	—	X
38 Water/waste												
38-10 Potable	—	X	X	X	—	—	—	X	—	—	—	—
38-20 Wash	—	—	—	—	—	—	—	—	—	—	—	—
38-30 Waste disposal	—	X	X	X	—	—	—	X	—	—	—	—
38-40 Air supply	X	X	—	—	—	—	—	—	—	—	—	—
41 Water ballast												
41-10 Storage	X	—	—	—	—	—	—	—	—	—	—	—
41-20 Dump	X	—	—	—	—	—	—	—	—	—	—	—
41-30 Indication	X	—	—	—	—	—	—	—	—	—	—	X
42 Integrated modular avionics	—	X	—	—	—	—	X	X	X	X	X	X
44 Cabin systems												
44-20 In-flight entertainment system	—	X	—	—	—	—	—	X	—	X	X	X
44-30 External communication	—	X	—	—	—	—	—	X	—	X	X	X

OJT TASK SELECTION												
ATA Chapters	**B1**						**B2**					
	INS	**FOT**	**SGH**	**R/I**	**MEL**	**TS**	**INS**	**FOT**	**SGH**	**R/I**	**MEL**	**TS**
Requirements: % of task categories	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**
system												
44-40 Cabin mass memory system	—	—	—	—	—	—	—	X	—	X	X	X
44-50 Cabin monitoring system	—	—	—	—	—	—	—	X	—	X	X	X
44-60 Miscellaneous cabin system	—	—	—	—	—	—	—	X	—	X	X	X
45 Onboard maintenance system	—	X	—	—	—	—	—	X	—	X	X	X
46 InformationSystems												
46-10 Aeroplane general information systems	—	—	—	—	—	—	—	X	—	X	X	X
46-20 Flight deck information systems	—	X	—	—	—	—	—	X	—	X	X	X
46-30 Maintenance information systems	—	X	—	—	—	—	—	X	—	X	X	X
46-40 Passenger cabin information systems	—	X	—	—	—	—	—	X	—	X	X	X
46-50 Miscellaneous information systems	—	—	—	—	—	—	—	X	—	X	X	X
Airframe structures: **52 Doors**												
52-10 Passenger/crew	X	—	X	X	X	—	—	—	—	—	—	—
52-20 Emergency exits	X	—	X	X	X	—	—	—	—	—	—	—
52-30 Cargo	X	—	—	—	—	—	—	—	—	—	—	—
52-40 Service and miscellaneous	X	—	—	—	—	—	—	—	—	—	—	—
52-50 Fixed interior	X	—	—	—	—	—	—	—	—	—	—	—
52-60 Entrance stairs	X	—	—	—	—	—	—	—	—	—	—	—
52-70 Monitoring and operation	—	X	—	—	—	—	X	X	—	—	—	X
52-80 Landing gear	X	—	X	—	—	—	—	—	—	—	—	—
53 Fuselage	X	—	—	—	—	X	—	—	—	—	—	—
54 Nacelles/pylons	X	—	—	—	—	—	—	—	—	—	—	—
55 Stabilisers	X	—	—	—	—	—	—	—	—	—	—	—
56 Windows	X	—	—	—	—	X	—	—	—	—	—	—

OJT TASK SELECTION												
ATA Chapters	**B1**						**B2**					
	INS	**FOT**	**SGH**	**R/I**	**MEL**	**TS**	**INS**	**FOT**	**SGH**	**R/I**	**MEL**	**TS**
Requirements: % of task categories	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**
57 Wings	X	—	—	—	—	—	—	—	—	—	—	—
Auxiliary powerunits (APUs):												
49 Auxiliar power unit												
49-10 Power plant	X	X	—	X	X	X	—	X	—	—	—	—
49-20 Engine	X	X	—	X	—	—	—	—	—	—	—	—
49-30 Engine fuel and control	—	X	—	X	—	—	—	—	—	—	—	—
49-40 Ignition/starting	—	X	—	—	—	—	X	—	—	—	—	X
49-50 Air	X	—	—	—	—	—	—	—	—	—	—	—
49-60 Engine controls	—	—	—	X	—	—	—	—	—	—	—	—
49-70 Indicating	—	X	—	—	—	—	—	—	—	—	—	—
49-80 Exhaust	X	—	—	—	—	—	—	—	—	—	—	—
49-90 Oil	—	—	X	—	—	—	—	—	—	—	—	—
Turbine engines:												
70 Standard practices and engineperformance	X	—	—	—	—	X	—	—	—	—	—	—
71 Power plant	X	—	X	—	—	—	—	—	—	—	—	—
71-10 Cowling	X	—	X	X			—	—	—	—	—	—
71-20 Mounts	X	—	—	—	—	—	—	—	—	—	—	—
71-30 Fire seals	X	—	—	—	—	—	—	—	—	—	—	—
71-40 Attach fittings	X	—	—	—	—	—	—	—	—	—	—	—
71-50 Electrical harness	X	X	—	X	—	—	X	—	—	—	—	X
71-60 Air intakes	X	—	—		—	—	—	—	—	—	—	—
72T Engine turbine / turboprop / ductedfan / unducted fan	X	—	X	X	—	—	—	—	—	—	—	—
73 Engine fuel and control												
73-10 Distribution	X	—	—	—	—	—	—	—	—	—	—	—
73-20 Controlling (FADEC)	X	X	—	X	X	X	—	X	—	—	—	X
73-30 Indicating	X	X	—	—	X	—	—	X	—	—	—	X
74 Ignition												
74-10 Electrical power	X	X	—	X	—	—	X	X	—	—	—	X

OJT TASK SELECTION												
ATA Chapters	**B1**						**B2**					
	INS	**FOT**	**SGH**	**R/I**	**MEL**	**TS**	**INS**	**FOT**	**SGH**	**R/I**	**MEL**	**TS**
Requirements: % of task categories	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**
74-20 Distribution	X	X	—	—	—	—	X	X	—	—	—	X
74-30 Switching	X	X	—	X	—	—	X	X	—	—	—	X
75 Air												
75-10 Engine anti-icing	X	X	—	X	X	X	—	—	—	—	—	—
75-20 Cooling	X	—	—	—	—	—	—	—	—	—	—	—
75-30 Compressor control	—	X	—	—	—	—	—	—	—	—	—	—
75-40 Indicating	—	X	—	—	—	—	—	X	—	—	—	X
76 Engine controls												
76-10 Power control (FADEC)	—	X	—	—	X	—	—	X	—	—	—	X
76-20 Emergency shutdown	—	—	—	—	X	—	—	—	—	—	—	—
77 Engine indicating	—	X	—	—	X	X	X	X	—	—	X	X
78 Exhaust												
78-30 Thrust reverser	X	—	—	X	X	X	—	X	—	—	—	X
79 Oil	X	—	X	X	—	—	—	—	—	—	—	—
80 Starting	X	X	—	X	X	X	—	—	—	—	—	—
83 Accessory gearboxes	X	—	X	X	—	—	—	—	—	—	—	—
Piston engines:												
70 Standard practices and engineperformance	X	—	—	—	—	X	—	—	—	—	—	—
71 Power plant	X	—	X	—	—	—	—	—	—	—	—	—
71-10 Cowling	X	—	X	X	—	—	—	—	—	—	—	—
71-20 Mounts	X	—	—	—	—	—	—	—	—	—	—	—
71-30 Fire seals	X	—	—	—	—	—	—	—	—	—	—	—
71-40 Attach fittings	X	—	—	—	—	—	—	—	—	—	—	—
71-50 Electrical harness	X	X	—	X	—	—	X	—	—	—	—	X
71-60 Air intakes	X	—	—	—	—	—	—	—	—	—	—	—
72R Engine — reciprocating	X	—	X	X	—	—	—	—	—	—	—	—
73 Engine fuel and control	X	X	—	X	X	X	—	—	—	—	—	—
73-10 Distribution	X	—	—	—	—	—	—	—	—	—	—	—

OJT TASK SELECTION												
ATA Chapters	**B1**						**B2**					
	INS	**FOT**	**SGH**	**R/I**	**MEL**	**TS**	**INS**	**FOT**	**SGH**	**R/I**	**MEL**	**TS**
Requirements: % of task categories	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**	**75 %**	**50 %**	**50 %**	**50 %**	**25 %**	**25 %**
73-20 Controlling (FADEC)	X	X	—	X	X	X	—	X	—	—	—	X
73-30 Indicating	X	X	—	—	X	—	X	X	—	—	—	X
74 Ignition												
74-10 Electrical power	X	X	—	X	—	X	X	X	—	—	—	X
74-20 Distribution	X	X	—	—	—	—	X	X	—	—	—	X
74-30 Switching	X	X	—	X	—	—	X	X	—	—	—	X
76 Engine controls	X	X	—	X	—	X	-	X	—	—	—	X
77 Engine indicating	—	X	—	—	X	X	X	X	—	—	X	X
78 Exhaust	X	—	—	—	—	—	—	—	—	—	—	—
79 Oil	X	—	X	X	—	—	—	—	—	—	—	—
80 Starting	X	X	—	X	X	X	—	—	—	—	—	—
81 Turbines (reciprocating engine)	X	X	X	X	—	—	—	—	—	—	—	—
83 Accessory gearboxes	X	—	X	X	—	—	—	—	—	—	—	—
61 Propellers/propulsion	**Propellers:**											
61-10 Propeller assembly	X	—	X	X	—	—	—	—	—	—	—	—
61-20 Controlling	—	—	—	X	X	—	—	—	—	—	—	—
61-30 Braking	X	—	—	—	—	—	—	—	—	—	—	—
61-40 Indicating	—	X	—	—	X	X	—	X	—	—	—	X
61-50 Propulsor duct	X	—	—	—	—	—	—	—	—	—	—	—
61B Propeller pitch control	—	X	—	X	X	X	—	—	—	—	—	—
61C Propeller synchronising	—	X	—	—	—	X	—	X	—	—	—	X
61D Propeller electronic control	—	X	X	X	X	X	—	X	—	—	—	X
61E Propeller ice protection	X	X	—	—	X	X	—	—	—	—	—	—

Note: For ATA Chapter 5, select at least one task from category (a), two tasks from category (b), and three tasks from category (c):

a) Perform and/or assist in performing a scheduled maintenance check:
   - accomplishment of 100-hour check (general aviation (GA) aircraft);
   - accomplishment of a 'daily' or 'weekly ', 'service', 'transit' or equivalent check;
   - active participation in a scheduled check eg 'A-check', 'B-Check', 'C-Check' or the equivalent of a base maintenance

b) Review the aircraft maintenance log for correct completion:
   - closure of MEL/CDL items;
   - dent and buckle chart review, including inspections on fuselage and skin damages assessment in accordance with the SRM;
   - fuel or oil leakage tests.

c) Perform unscheduled inspection following:
   - hard landing;
   - overweight taxiing;
   - bird/hail strike;
   - aborted take-off;
   - high-energy stop;
   - wheel-bearing failure;
   - exceedance of max NLG steering angle;
   - landing gear shimmy/vibrations;
   - lightning strike / HIRF;
   - tail strike;
   - winglet strike;
   - severe turbulence / extreme high winds;
   - airframe vibrations;
   - ice/snow conditions;
   - flight control overspeed down;
   - hot-air duct rupture;
   - relief pressure panels open;
   - mercury spillage;
   - galley spill;
   - hydraulic fluid reaction with titanium;
   - cabin overpressure;
   - exceedance of fuel imbalance;
   - smoke/fumes in the cabin;
   - abnormal doors operations;
   - ferry flight maintenance;
   - others

GM1 Appendix II to AMC to CAR 66 Aircraft Type Practical Experience and On-the-Job Training List of Tasks

The following list represents an example of OJT tasks for B1.1 and B2 (Aeroplanes Turbine) AMEL categories. The list is not exhaustive, nor tailored to a specific aircraft type, and should be reviewed and adjusted as necessary

Task No	ATA chapter	Task description	B1.1	B2
1	05 Time limits / maintenance checks	Perform (assist) in A-Check	X	X
2	05 Time limits / maintenance checks	Close MEL/CDL item	X	X
3	05 Time limits / maintenance checks	Review Dent & Buckle chart	X	—
4	05 Time limits / maintenance checks	Perform bird strike inspection	X	—
5	05 Time limits / maintenance checks	Perform lightning strike inspection	X	X
6	05 Time limits / maintenance checks	Perform tail strike inspection	X	—
7	05 Time limits / maintenance checks	Review AD compliance	X	X
8	06 Dimensions/areas	Locate component by station number	X	X
9	07 Lifting and shoring	Jack aircraft wheel	X	—
10	07 Lifting and shoring	Jack the aircraft	X	—
11	08 Levelling and weighing	Level the aircraft	X	—
12	08 Levelling and weighing	Weigh the aircraft (including W & B amendment)	X	—
13	08 Levelling and weighing	Check the aircraft against equipment list	X	X
14	09 Towing and taxiing	Tow the aircraft (including preparation)	X	—
15	10 Parking/mooring, storing and return to service	Park aircraft (including applying applicable protections to parking duration)	X	—
16	10 Parking/mooring, storing and return to service	Position aircraft in dock	X	—
17	11 Placards and markings	Perform placards and markings inspection	X	X
18	12 Servicing	Perform aircraft refuelling (automatic and manual)	X	—
19	12 Servicing	Check and adjust tyre pressure	X	—
20	12 Servicing	Check and replenish hydraulic fluid	X	—
21	12 Servicing	Check and adjust accumulator pressure	X	—
22	12 Servicing	Check and replenish engine oil	X	—
23	12 Servicing	Perform landing gear servicing	X	—
24	12 Servicing	Perform waste / potable water servicing	X	—
25	12 Servicing	Connect ground power	X	X
26	12 Servicing	Lubricate flight control elements	X	—
27	20 Standard practices	Perform aircraft grounding	X	X

Task No	ATA chapter	Task description	B1.1	B2
28	20 Standard practices	Perform ESDS device inspection	X	X
21 Air conditioning			…	…
29	21-20 Distribution	Replace recirculation filter	X	—
30	21-40 Heating	Replace combustion heater	X	—
31	21-20 Distribution	Clean outflow valve	X	—
32	21-20 Distribution	Replace outflow valve	X	—
33	21-50 Cooling	Replace ACM / Air cycle unit	X	—
34	21-50 Cooling	Replace heat exchanger	X	—
35	21-30 Pressurisation control	Replace pressurisation controller	X	X
36	21-30 Pressurisation control	Perform pressurisation system functional test	X	X
37	21-20 Distribution	Perform equipment cooling system functional test	X	X
38	21-20 Distribution	Check configuration of AVX compartment ventilation system	X	X
39	21-30 Pressurisation control	Perform air-conditioning system functional test	X	X
40	21-60 Temperature control	Perform temperature control system functional test	X	X
41	21 Air conditioning	Troubleshoot faulty system	X	X
42	22 Autoflight	Replacement of autothrottle servomechanisms components	X	—
43	22 Autoflight	Replace actuator	X	—
44	22 Autoflight	Replace controller	X	X
45	22 Autoflight	Replace amplifier	X	X
46	22 Autoflight	Replace autoflight system LRU	X	X
47	22 Autoflight	Perform yam damper operational test	X	X
48	22 Autoflight	Perform autopilot functional test	X	X
49	22 Autoflight	Perform autopilot gain adjustment	—	X
50	22 Autoflight	Check augmentation system	X	X
51	22 Autoflight	Check operation of autothrottle	X	X
52	22 Autoflight	Perform autoland functional test	X	X
53	22 Autoflight	Check flight management systems	X	X
54	22 Autoflight	Perform Mach trim functional test	—	X
55	22 Autoflight	Upload FM data	X	X
56	22 Autoflight	Troubleshoot faulty system	—	X
57	23 Communications	Perform interphone system operational test	X	X
58	23 Communications	Service interphone components	X	X
59	23 Communications	Replace HF unit	X	X
60	23 Communications	Replace VHF unit	X	X
61	23 Communications	Replace antenna	X	X
62	23 Communications	Perform voice recorder operational test	X	X
63	23 Communications	Replace voice recorder	X	X

Task No	ATA chapter	Task description	B1.1	B2
64	23 Communications	Perform static discharge components inspection	X	X
65	23 Communications	Perform radio functional test	—	X
66	23 Communications	Perform SELCAL operational test	X	X
67	23 Communications	Perform co-axial cable repair	—	X
68	23 Communications	Perform ELT operational test	X	X
69	23 Communications	Troubleshoot faulty system	—	X
70	24 Electrical power	Supply/remove APU power	X	X
71	24 Electrical power	Remove/install battery	X	X
72	24 Electrical power	Charge battery	X	X
73	24 Electrical power	Perform battery charger operational test	X	X
74	24 Electrical power	Perform standby power system functional test	X	X
75	24 Electrical power	Replace IDG oil filter	X	X
76	24 Electrical power	Remove/install IDG	X	X
77	24 Electrical power	Perform IDG functional test	X	X
78	24 Electrical power	Replace switch	X	X
79	24 Electrical power	Replace CB	X	X
80	24 Electrical power	Replace voltage regulator	—	X
81	24 Electrical power	Perform voltage regulator functional test	X	X
82	24 Electrical power	Perform electrical feeder cable repair	—	X
83	25 Equipment and furnishings	Perform emergency equipment inspection	X	X
84	25 Equipment and furnishings	Replace carpets	X	—
85	25 Equipment and furnishings	Perform crew seats operational test	X	—
86	25 Equipment and furnishings	Replace crew seats	X	—
87	25 Equipment and furnishings	Replace passenger seats	X	—
88	25 Equipment and furnishings	Perform seats and seat belts inspection	X	—
89	25 Equipment and furnishings	Check ELT for compliance with applicable regulations	X	X
90	25 Equipment and furnishings	Perform escape slide inspection	X	—
91	25 Equipment and furnishings	Remove/install escape slide	X	—
92	25 Equipment and furnishings	Perform upholstery repair	X	—
93	25 Equipment and furnishings	Remove/install interior panels	X	—
94	25 Equipment and furnishings	Remove/install cargo compartment panels	X	—
95	25 Equipment and	Perform cargo loading system inspection	X	—

Task No	ATA chapter	Task description	B1.1	B2
	furnishings			
96	25 Equipment and furnishings	Perform cargo loading system functional test	X	X
97	25 Equipment and furnishings	Replace cargo loading system actuator	X	—
98	26 Fire protection	Check fire bottle content	X	—
99	26 Fire protection	Remove/install fire bottle	X	—
100	26 Fire protection	Replace fire bottle squib	X	—
101	26 Fire protection	Check portable fire-extinguisher content	X	—
102	26 Fire protection	Perform smoke detection system functional test	X	X
103	26 Fire protection	Perform smoke detectors inspection	X	X
104	26 Fire protection	Remove/install smoke detectors	X	X
105	26 Fire protection	Perform fire protection system inspection	X	X
106	26 Fire protection	Perform fire protection system functional test	X	X
107	26 Fire protection	Perform engine fire detection system inspection	X	X
108	26 Fire protection	Troubleshoot faulty system	X	X
109	27 Flight controls	Perform horizontal stabiliser components inspection	X	—
110	27 Flight controls	Perform horizontal stabiliser operational test	X	X
111	27 Flight controls	Remove/install horizontal stabiliser	X	—
112	27 Flight controls	Perform elevator components inspection	X	—
113	27 Flight controls	Perform elevator operational test	X	X
114	27 Flight controls	Remove/install elevator	X	—
115	27 Flight controls	Perform aileron components inspection	X	—
116	27 Flight controls	Perform aileron operational test	X	X
117	27 Flight controls	Remove/install aileron	X	—
118	27 Flight controls	Perform rudder components inspection	X	—
119	27 Flight controls	Perform rudder operational test	X	X
120	27 Flight controls	Remove/install rudder	X	—
121	27 Flight controls	Remove/install trim tab	X	—
122	27 Flight controls	Perform LE flap components inspection	X	—
123	27 Flight controls	Perform LE flap operational test	X	X
124	27 Flight controls	Perform LE devices alternate operation	X	X
125	27 Flight controls	Remove/install LE flap	X	—
126	27 Flight controls	Perform TE flap components inspection	X	—
127	27 Flight controls	Perform TE flap operational test	X	X
128	27 Flight controls	Perform TE devices alternate operation	X	X
129	27 Flight controls	Remove/install TE flap	X	—
130	27 Flight controls	Perform spoiler components inspection	X	—

Task No	ATA chapter	Task description	B1.1	B2
131	27 Flight controls	Perform spoiler operational test	X	X
132	27 Flight controls	Remove/install spoiler	X	—
133	27 Flight controls	Perform slat component inspection	X	—
134	27 Flight controls	Perform slat operational test	X	X
135	27 Flight controls	Remove/install slat	X	—
136	27 Flight controls	Replace control cable and fittings	X	—
137	27 Flight controls	Perform control cable tension adjustment	X	—
138	27 Flight controls	Remove/install actuator	X	—
139	27 Flight controls	Remove/install powered control unit	X	—
140	27 Flight controls	Perform flight controls functional test	X	X
141	27 Flight controls	Perform stall warning system functional test	X	X
142	27 Flight controls	Perform control column operational test	X	X
143	27 Flight controls	Deactivate/reactivate servo control	X	-
144	27 Flight controls	Check / adjust gearbox oil level	X	-
145	27 Flight controls	Troubleshoot faulty system	X	X
146	28 Fuel systems	Perform fuel/defuel system components inspection	X	—
147	28 Fuel systems	Fuel quantity indicating system functional test	X	X
148	28 Fuel systems	Perform fuel transfer between tanks	X	—
149	28 Fuel systems	Perform booster pump inspection	X	—
150	28 Fuel systems	Remove/install booster pump	X	—
151	28 Fuel systems	Remove/install fuel selector	X	—
152	28 Fuel systems	Perform fuel tank inspection	X	—
153	28 Fuel systems	Remove/install fuel control valve	X	—
154	28 Fuel systems	Remove/install fuel level indicator	X	—
155	28 Fuel systems	Remove/install fuel line	X	—
156	28 Fuel systems	Remove/install flame arrestor	X	—
157	28 Fuel systems	Remove/install water drain valve	X	—
158	28 Fuel systems	Perform fuel content calculation	X	—
159	28 Fuel systems	Check fuel quantity gauge calibration	X	—
160	28 Fuel systems	Perform fuel feed/selectors functional test	X	X
161	28 Fuel systems	Perform fuel dump system functional test	X	X
162	28 Fuel systems	Troubleshoot faulty system	X	X
163	29 Hydraulic power	Perform hydraulic system components inspection	X	—
164	29 Hydraulic power	Check hydraulic system indication	X	x
165	29 Hydraulic power	Perform hydraulic system functional test	X	X
166	29 Hydraulic power	Check auxiliary system indication	X	x
167	29 Hydraulic power	Perform auxiliary system functional test	X	X
168	29 Hydraulic power	Depressurise/pressurise hydraulic reservoirs	X	—

Task No	ATA chapter	Task description	B1.1	B2
169	29 Hydraulic power	Perform pressurisation module leak check	X	—
170	29 Hydraulic power	Perform shut-off valve operational test	X	X
171	29 Hydraulic power	Replace hydraulic filter	X	—
172	29 Hydraulic power	Replace engine-driven pump	X	—
173	29 Hydraulic power	Replace hydraulic system valve	X	—
174	29 Hydraulic power	Replace hydraulic system line	X	—
175	29 Hydraulic power	Perform power transfer unit operational test	X	X
176	29 Hydraulic power	Remove/install power transfer unit	X	—
177	29 Hydraulic power	Troubleshoot faulty system	X	X
178	30 Ice and rain protection	Perform windshield wiper system components inspection	X	—
179	30 Ice and rain protection	Replace windshield wiper	X	—
180	30 Ice and rain protection	Replace windshield wiper motor	X	—
181	30 Ice and rain protection	Adjust windshield wiper tension	X	—
182	30 Ice and rain protection	Perform ice detection components inspection	X	—
183	30 Ice and rain protection	Check ice detection indication	X	X
184	30 Ice and rain protection	Perform de-icing/anti-icing system components inspection	X	—
185	30 Ice and rain protection	Perform de-icing/anti-icing system functional test	X	X
186	30 Ice and rain protection	Replace de-icing/anti-icing valve	X	—
187	30 Ice and rain protection	Replace solenoid valve	X	X
188	30 Ice and rain protection	Perform probe heating system components inspection	X	—
189	30 Ice and rain protection	Perform probe heating system functional test	X	X
190	30 Ice and rain protection	Perform window heating system component inspection	X	—
191	30 Ice and rain protection	Perform window heating system functional test	X	X
192	30 Ice and rain protection	Troubleshoot faulty system	X	X
193	31 Indicating/recording systems	Perform flight data recorder system components inspection	X	X
194	31 Indicating/recording systems	Perform flight data recorder system operational test	X	X
195	31 Indicating/recording systems	Remove/install flight data recorder	X	X
196	31 Indicating/recording systems	Remove/install clock	X	X
197	31 Indicating/recording systems	Remove/install master caution unit	X	X
198	31 Indicating/recording systems	Perform flight data recorder data retrieval	X	X
199	31 Indicating/recording systems	Perform data acquisition unit functional test	X	X
200	31 Indicating/recording systems	Remove/install data acquisition unit	X	X

Task No	ATA chapter	Task description	B1.1	B2
201	31 Indicating/recording systems	Perform warning system functional test	X	X
202	31 Indicating/recording systems	Perform EIS operational test	X	X
203	31 Indicating/recording systems	Troubleshoot faulty system	—	X
204	32 Landing gear	Perform tyres and brakes inspection	X	—
205	32 Landing gear	Replace brake unit	X	—
206	32 Landing gear	Perform wheels assembly	X	—
207	32 Landing gear	Perform wheels inspection	X	—
208	32 Landing gear	Replace wheels	X	—
209	32 Landing gear	Replace steering actuator	X	—
210	32 Landing gear	Perform NLG steering rigging	X	—
211	32 Landing gear	Perform autobrake system components inspection	X	—
212	32 Landing gear	Perform autobrake system functional test	X	X
213	32 Landing gear	Perform landing gear alternate brake control components inspection	X	—
214	32 Landing gear	Perform landing gear alternate brake control functional test	X	X
215	32 Landing gear	Perform parking brake components inspection	X	—
216	32 Landing gear	Perform parking brake functional test	X	X
217	32 Landing gear	Perform antiskid operational test	X	X
218	32 Landing gear	Perform landing gear extension/retraction system components inspection	X	—
219	32 Landing gear	Replace landing gear retraction actuator	X	—
220	32 Landing gear	Perform landing gear extension/retraction system functional test	X	X
221	32 Landing gear	Replace uplock/downlock assembly	X	—
222	32 Landing gear	Perform sensor adjustment	X	X
223	32 Landing gear	Perform landing gear operational test	X	X
224	32 Landing gear	Perform landing gear abnormal operationaltest	X	X
225	32 Landing gear	Replace landing gear door	X	—
226	32 Landing gear	Replace landing gear control cable	X	—
227	32 Landing gear	Replace landing gear safety sensor	X	—
228	32 Landing gear	Replace landing gear shock strut	X	—
229	32 Landing gear	Replace shimmy damper	X	—
230	32 Landing gear	Perform air–ground system functional test	X	X
231	32 Landing gear	Troubleshoot faulty system	X	X
232	33 Lights	Perform interior lights inspection	X	X
233	33 Lights	Perform interior lights operational test	X	X

Task No	ATA chapter	Task description	B1.1	B2
234	33 Lights	Replace interior lights	X	X
235	33 Lights	Replace push-button switch	X	X
236	33 Lights	Perform cargo lights	X	X
237	33 Lights	Perform cargo lights operational test	X	X
238	33 Lights	Replace cargo lights	X	X
239	33 Lights	Perform exterior lights inspection	X	X
240	33 Lights	Perform exterior lights operational test	X	X
241	33 Lights	Replace exterior lights	X	X
242	33 Lights	Perform emergency lights inspection	X	X
243	33 Lights	Perform emergency lights operational test	X	X
244	33 Lights	Replace emergency lights	X	X
245	33 Lights	Perform landing lights inspection	X	X
246	33 Lights	Perform landing lights operational test	X	X
247	33 Lights	Replace landing lights	X	X
248	33 Lights	Perform navigation lights inspection	X	X
249	33 Lights	Perform navigation lights operational test	X	X
250	33 Lights	Replace navigation lights	X	X
251	33 Lights	Perform logo lights inspection	X	X
252	33 Lights	Perform logo lights operational test	X	X
253	33 Lights	Replace logo lights	X	X
254	33 Lights	Troubleshoot faulty system	X	X
255	34 Navigation	Perform Pitot-static system components inspection	X	X
256	34 Navigation	Replace Pitot-static probe	—	X
257	34 Navigation	Perform static and total air pressure drainfitting	—	X
258	34 Navigation	Perform static pressure port inspection	—	X
259	34 Navigation	Replace static pressure port	—	X
260	34 Navigation	Replace VOR/ILS	—	X
261	34 Navigation	Perform VOR/ILS functional test	—	X
262	34 Navigation	Replace DME	—	X
263	34 Navigation	Perform DME functional test	—	X
264	34 Navigation	Perform inertial reference system functional test	—	X
265	34 Navigation	Replace inertial reference unit	—	X
266	34 Navigation	Perform altimeter functional test	—	X
267	34 Navigation	Replace altimeter	—	X
268	34 Navigation	Perform air data computer functional test	—	X
269	34 Navigation	Replace air data computer	—	X
270	34 Navigation	Perform air speed indicator functional test	—	X
271	34 Navigation	Replace air speed indicator	—	X

Task No	ATA chapter	Task description	B1.1	B2
272	34 Navigation	Perform weather radar functional test	—	X
273	34 Navigation	Replace weather radar	—	X
274	34 Navigation	Perform TCAS functional test	—	X
275	34 Navigation	Replace TCAS	—	X
276	34 Navigation	Perform ATC transponder functional test	—	X
277	34 Navigation	Replace ATC transponder	—	X
278	34 Navigation	Perform EGPWS functional test	—	X
279	34 Navigation	Replace EGPWS	—	X
280	34 Navigation	Perform ADF functional test	—	X
281	34 Navigation	Replace ADF	—	X
282	34 Navigation	Perform satellite communications system functional test	—	X
283	34 Navigation	Update FM system database	—	X
284	34 Navigation	Perform magnetic compass calibration	X	X
285	34 Navigation	Troubleshoot faulty system	—	X
286	35 Oxygen	Perform crew oxygen system components inspection	X	—
287	35 Oxygen	Service crew oxygen system	X	—
288	35 Oxygen	Perform crew oxygen system functional test	X	X
289	35 Oxygen	Perform passenger oxygen system inspection	X	—
290	35 Oxygen	Service passenger oxygen system	X	—
291	35 Oxygen	Perform passenger oxygen system functional test	X	X
292	35 Oxygen	Replace regulator	X	—
293	35 Oxygen	Replace valve	X	—
294	35 Oxygen	Replace oxygen generator	X	—
295	35 Oxygen	Replace discharge disk	X	—
296	35 Oxygen	Replace protective breathing equipment	X	—
297	35 Oxygen	Perform auto-deployment test	X	X
298	35 Oxygen	Troubleshoot faulty system	X	X
299	36 Pneumatic	Perform pneumatic system components inspection	X	—
300	36 Pneumatic	Perform pneumatic system functional test	X	X
301	36 Pneumatic	Perform pneumatic system leakage test	X	—
302	36 Pneumatic	Replace filter	X	—
303	36 Pneumatic	Replace duct	X	—
304	36 Pneumatic	Remove/install shut-off valve	X	—
305	36 Pneumatic	Remove/install regulating valve	X	—
306	36 Pneumatic	Remove/install regulator	X	—
307	36 Pneumatic	Troubleshoot faulty system	X	X
308	37 Vacuum	Perform vacuum system components inspection	X	—

Task No	ATA chapter	Task description	B1.1	B2
309	37 Vacuum	Perform vacuum system functional test	X	X
310	37 Vacuum	Replace vacuum pump	X	—
311	37 Vacuum	Remove/install regulator	X	—
312	37 Vacuum	Replace filter	X	—
313	37 Vacuum	Troubleshoot faulty system	X	X
314	38 Water/waste	Perform water system components inspection	X	—
315	38 Water/waste	Perform water system functional test	X	X
316	38 Water/waste	Depressurise/pressurise water tank	X	—
317	38 Water/waste	Replace water pump	X	—
318	38 Water/waste	Replace water faucet	X	—
319	38 Water/waste	Perform water heater operational check	X	—
320	38 Water/waste	Perform waste system components inspection	X	—
321	38 Water/waste	Perform waste system functional test	X	X
322	38 Water/waste	Replace waste pump	X	—
323	38 Water/waste	Replace valve	X	—
324	38 Water/waste	Replace tank	X	—
325	38 Water/waste	Perform lavatory drain valve operational test	X	—
326	38 Water/waste	Troubleshoot faulty system	X	X
327	45 Onboard maintenance system	Perform communications management unit functional test	X	X
328	45 Onboard maintenance system	Replace communications management unit	X	X
329	45 Onboard maintenance system	Perform communications management unit data retrieval	X	X
330	45 Onboard maintenance system	Troubleshoot faulty system	—	X
331	49 Auxiliary Power Unit	Perform APU components inspection	X	—
332	49 Auxiliary Power Unit	Perform APU functional test	X	X
333	49 Auxiliary Power Unit	Record APU data	X	—
334	49 Auxiliary Power Unit	Perform APU start/shutdown	X	X
335	49 Auxiliary Power Unit	Replace APU air inlet door actuator	X	—
336	49 Auxiliary Power Unit	Replace APU air inlet switch	X	—
337	49 Auxiliary Power Unit	Replace APU fuel nozzle	X	—
338	49 Auxiliary Power Unit	Replace APU igniter plug	X	—
339	49 Auxiliary Power Unit	Perform chip detector inspection	X	—
340	49 Auxiliary Power Unit	Perform APU emergency shutdown system functional test	X	X
341	49 Auxiliary Power Unit	Troubleshoot faulty system	X	X
342	51 Structures	Apply protective treatment	X	—

Task No	ATA chapter	Task description	B1.1	B2
343	52 Doors	Perform entry door components inspection	X	—
344	52 Doors	Perform entry door operational test	X	—
345	52 Doors	Remove/install entry door	X	—
346	52 Doors	Perform crew door components inspection	X	—
347	52 Doors	Perform crew door operational test	X	—
348	52 Doors	Perform emergency exit door components inspection	X	—
349	52 Doors	Perform emergency exit door operational test	X	—
350	52 Doors	Remove/install emergency exit door	X	—
351	52 Doors	Perform cargo door components inspection	X	—
352	52 Doors	Perform cargo door operational test	X	—
353	52 Doors	Perform compartments doors components inspection	X	—
354	52 Doors	Perform compartments doors operational test	X	—
355	52 Doors	Perform snubber replacement	X	—
356	52 Doors	Perform locking mechanism rigging/adjustment	X	—
357	52 Doors	Perform air stair functional test	X	X
358	52 Doors	Perform door warning system functional test	X	X
359	52 Doors	Troubleshoot faulty system	X	X
360	53 Fuselage	Perform radome inspection	X	—
361	53 Fuselage	Perform damage assessment	X	—
362	53 Fuselage	Perform structural repair	X	—
363	54 Nacelles/pylons	Perform nacelle/pylon components inspection	X	—
364	54 Nacelles/pylons	Remove/install nacelle strut	X	—
365	55 Stabilisers	Perform vertical stabiliser inspection	X	—
366	55 Stabilisers	Perform horizontal stabiliser inspection	X	—
367	55 Stabilisers	Perform horizontal stabiliser conductive strip repair	X	—
368	56 Windows	Perform passenger cabin windows inspection	X	—
369	56 Windows	Remove/install passenger window	X	—
370	56 Windows	Perform flight compartment windows inspection	X	—
371	56 Windows	Remove/install flight compartment window	X	—
372	56 Windows	Perform flight compartment windows operational test	X	—
373	57 Wings	Perform wing structure inspection	X	—
374	57 Wings	Replace wing tip	X	—
375	57 Wings	Replace wing rib	X	—
376	57 Wings	Perform wing structural repair	X	—
377	70 Standard practices and engine performance	Perform fluorescent penetrant inspection	X	—

Task No	ATA chapter	Task description	B1.1	B2
378	70 Standard practices and engine performance	Perform engine wiring harness repair	X	X
379	71 Power plant	Perform power plant components inspection	X	—
380	71 Power plant	Perform powerplant removal/installation	X	—
381	71 Power plant	Replace engine mounts	X	—
382	71 Power plant	Perform FOD inspection	X	—
383	71 Power plant	Remove/install engine harness	X	—
384	71 Power plant	Perform power plant adjustment/test	X	—
385	71 Power plant	Perform (assist) in engine dry motoring	X	—
386	71 Power plant	Perform (assist) in engine run	X	—
387	71 Power plant	Troubleshoot faulty system	X	X
388	72 Engine	Perform fan assembly inspection	X	—
389	72 Engine	Remove/install fan blade	X	—
390	72 Engine	Replace acoustical panel	X	—
391	72 Engine	Perform engine compressor inspection	X	—
392	72 Engine	Perform engine combustion case inspection	X	—
393	72 Engine	Perform engine turbine inspection	X	—
394	72 Engine	Perform gearbox assembly inspection	X	—
395	72 Engine	Perform compressor wash	X	—
396	72 Engine	Perform HPC borescope inspection	X	—
397	72 Engine	Perform hot section borescope inspection	X	—
398	72 Engine	Perform HPT borescope inspection	X	—
399	72 Engine	Remove/install igniter	X	—
400	72 Engine	Remove/install fuel nozzle	X	—
401	72 Engine	Troubleshoot faulty system	X	X
402	73 Engine fuel and control	Perform engine fuel system componentsinspection	X	—
403	73 Engine fuel and control	Replace engine fuel filters	X	—
404	73 Engine fuel and control	Replace engine-driven pump	X	—
405	73 Engine fuel and control	Perform FADEC functional test	X	—
406	73 Engine fuel and control	Remove/install engine electronic control module/unit	X	—
407	73 Engine fuel and control	Troubleshoot faulty system	X	X
408	74 Ignition	Perform ignition system components visual inspection	X	—
409	74 Ignition	Perform ignition system functional test	X	X
410	74 Ignition	Remove/install igniter plug	X	—
411	74 Ignition	Remove/install ignition exciter	X	—
412	74 Ignition	Troubleshoot faulty system	X	X
413	75 Air	Perform engine air system components inspection	X	—

Task No	ATA chapter	Task description	B1.1	B2
414	75 Air	Remove/install VSV actuator	X	—
415	75 Air	Remove/install VBV actuator	X	—
416	75 Air	Perform engine air system functional test	X	X
417	76 Engine controls	Perform engine controls components inspection	X	—
418	76 Engine controls	Perform engine controls	X	—
419	76 Engine controls	Perform engine controls functional test	X	X
420	76 Engine controls	Perform thrust lever rigging	X	—
421	76 Engine controls	Remove/install thrust lever	X	—
422	76 Engine controls	Troubleshoot faulty system	X	X
423	77 Engine indicating	Perform engine indicating components inspection	X	—
424	77 Engine indicating	Perform engine indicating functional test	X	X
425	77 Engine indicating	Replace engine instrument	X	X
426	77 Engine indicating	Replace engine thermocouples	X	X
427	77 Engine indicating	Replace oil temperature bulb	X	X
428	77 Engine indicating	Troubleshoot faulty system	X	X
429	78 Exhaust	Perform exhaust components inspection	X	—
430	78 Exhaust	Perform thrust reverser operational test	X	X
431	78 Exhaust	Deactivate/reactivate thrust reverser for maintenance	X	—
432	78 Exhaust	Remove/install thrust reverser	X	—
433	78 Exhaust	Remove/install blocker door	X	—
434	78 Exhaust	Replace shroud assembly	X	—
435	79 Oil	Perform oil system components inspection	X	—
436	79 Oil	Perform oil system functional test	X	X
437	79 Oil	Replace oil filter	X	—
438	79 Oil	Replace oil pump	X	—
439	79 Oil	Replace oil cooler	X	—
440	79 Oil	Remove/install oil pressure sensor	X	X
441	79 Oil	Remove/install oil tank	X	—
442	79 Oil	Troubleshoot faulty system	X	X
443	80 Starting	Perform engine starting system components inspection	X	—
444	80 Starting	Perform engine starting system functional test	X	X
445	80 Starting	Replace engine start valve	X	—
446	80 Starting	Remove/install engine starter	X	—
447	80 Starting	Remove/install starter relay	X	X
448	80 Starting	Troubleshoot faulty system	X	X

APPENDIX III to AMC of CAR-66

Evaluation of the competence: assessment and assessors

This Appendix applies to the competence assessment performed by the designatedassessors (and their qualifications).

1) What does "competence" mean and areas of focus for assessment

The assessment should aim at measuring the competence by evaluating three majorfactors associated to the learning objectives:

- Knowledge;
- Skills;
- Attitude.

Generally, knowledge is evaluated by examination. The purpose of this document is not to describe the examination process: this material mainly addresses the evaluation of "skills" and "attitude" after training containing practical elements. Nevertheless, the trainee needs to demonstrate sufficient knowledge to perform the required tasks.

"Attitude" is indivisible from the "skill" as this greatly contributes to the safeperformance of the tasks.

The evaluation of the competence should be based on the learning objectives of thetraining, in particular:

- the (observable) desired performance. This covers what the trainee is expected to beable to do and how the trainee is expected to behave at the end of the training;

- the (measurable) performance standard that must be attained to confirm thetrainee's level of competence in the form of tolerances, constraints, limits, performance rates or qualitative statements; and

- the conditions under which the trainee will demonstrate competence. Conditionsconsist of the training methods, the environmental, situational and regulatory factors.

The assessment should focus on the competencies relevant to the aircraft type and itsmaintenance including, but not limited to:

- Environmental awareness (act safely, apply safety precautions and preventdangerous situations);

- Systems integration (demonstrate understanding of aircraft systems interaction,identify, describe, explain, plan, execute);

- Knowledge and understanding of areas requiring special emphasis or novelty (areaspeculiar to

the aircraft type, domains not covered by CAR 66 Appendix I, practical training elements that cannot be imparted through simulation devices, etc.);

- Using reports and indications (the ability to read and interpret);
- Aircraft documentation finding and handling (identify the appropriate aircraft documentation, navigate, execute and obey the prescribed maintenance procedures);
- Perform maintenance actions (demonstrate safe handling of aircraft, engines,components and tools);
- Aircraft final/close-up and report (apply close up, initiate appropriate actions /follow-up/ records of testing, establish and sign maintenance reords /logbooks).

2) How to assess

As far as feasible, the objectives of the assessment should be associated with the learningobjectives and the passing level; it means that observable criteria should be set tomeasure the performance and should remain as objective as possible.

The general characteristics of effective assessment are: objective, flexible, acceptable, comprehensive, constructive, organized and thoughtful. At the conclusion, the trainee should have no doubt about what he/she did well, what he/she did poorly and how he/she can improve.

The following is a non-exhaustive list of questions that may be posed to assist theassessment:

- What are the success factors for the job?
- What are typical characteristics of a correct behavior for the task?
- What criteria should be observed?
- What level of expertise is expected?
- Is there any standard available?
- What is the pass mark? For example:o "Go-no go" situation;
  - o How to allocate points? Minimum amount to succeed;
  - o "Must know or execute" versus "Good to know or execute" versus "Don't expectthe candidate to be an expert".
- Minimum or maximum time to achieve? Use time effectively and efficiently.
- What if the trainee fails? How many times is the trainee allowed to fail?
- When and how should the trainee be prepared for the assessment?
- What proportion of judgment by the instructor out of collaboration with the traineeis needed during the evaluation stage?

The assessment may be:

- diagnostic (prior to a course), formative (reorientate the course on areas where thereis a need to reinforce) or summative (partial or final evaluation);
- performed task-by-task, as a group of tasks or as a final assessment.

One method might be an initial assessment to be performed by the trainee himself/ herself, then discussing areas where the perceptions of the trainee's performance by theassessors differ in order to:

- develop the self-assessment habits;

- make the assessment more acceptable and understandable to both parties.

A “box-ticking” exercise would be pointless. Experience has shown that assessment sheets have largely evolved over time into assessment of groups of “skills” because in practice such things eventually detracted from the training and assessment that it was intended to serve: evaluate at a point of time, encourage and orientate the training needs, improve safety and ultimately qualify people for their duties.

In addition, many other aspects should be appropriately considered during the assessment process such as stress and environmental conditions, difficulty of the test, history of evaluation (such as tangible progresses or sudden and unexpected poor performance made by the trainee), amount of time necessary to build competence, etc.

All these reasons place more emphasis on the assessor and highlight the function of the organisation’s approval.

3) Who should assess

In order to qualify, the assessor should:

- Be proficient and have sufficient experience or knowledge in:

  o human performance and safety culture;
  o the aircraft type (necessary to have the certifying staff privileges in case of CRSissuances);
  o training/coaching/testing skills;
  o instructional tools to use;

- Understand the objective and the content of the practical elements of the trainingthat is being assessed;

- Have interpersonal skills to manage the assessment process (professionalism, sincerity objectivity and neutrality, analysis skills, sense of judgment, flexibility, capability of evaluating the mentor’s or instructor’s reports, handling of trainee’sreactions to failing assessment with the cultural environment, being constructive, etc.);

- Designated assessor is required to be nominated by the AMO and shall be authorised by DGCA.

The roles may be combined for:

- the assessor and the instructor for the practical elements of the Type RatingTraining; or
- the assessor and the mentor for the On-the-Job Training

Provided that the objectives associated with each role are clearly understood and that the competence and qualification criteria according to the approved manuals (MTOE/MOE) are met for both functions. Whenever possible (depending on the size of the organisation), it is recommended to split the roles (two different persons) in order to avoid any conflicts of interests.

When the functions are not combined, the role of each function should be clearlyunderstood

Appendix IV to AMC of CAR- 66. A. 45(d)

Fuel Tank Safety training

This appendix includes general instructions for providing training on Fuel Tank Safetyissues.

1. Level of training required by this Annex is only level 2.

Level 2 Detailed training

Objectives: The attendant should, after the completion of the training:

1. know the history and the theoretical and practical elements of the subject, have an overview of Special Federal Aviation Regulations (SFARs) from 14 CFR SFAR 88 of theFAA and of JAA TGL 47, be able to give a detailed description of the concept of CDCCL, Airworthiness Limitations Items (ALI) and using theoretical fundamentals and specificexamples,
2. have the capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.
3. have detailed information on how the above items affect the aircraft in the scope of theactivity of the organisation or in the fleet.
4. understand and carry out activities with the use of manufacturer and regulatory authority data providing instructions on design and maintenance, such as Service Bulletins, Airworthiness Directives, Aircraft Maintenance Manual, Component Maintenance Manual etc.
5. use easily the manufacturer's documentation from various sources and apply corrective action where appropriate.
6. identify the components or parts or the aircraft subject to FTS from the manufacturer's documentation, plan the action or apply a Service Bulletin and an Airworthiness Directive.

Continuing training

The interval between continuing training shall be established by the organisation employing such personnel, but should not exceed two years. The continuing training shallinclude knowledge on evolution of material, tools, documentation and manufacturer's orDGCA directives.

2. The personnel directly involved in Fuel Tank Safety (FTS) systems shall be qualified according to the following table:

Organisation	**Personnel**	**Level of knowledge**	**Continuing training**
CAR-66 licence holders in a continuing airworthiness management organisation	The airworthinessreview staff as required by M.A.707.	2	Yes
CAR-66 licence holders in aircraft and component maintenance organisations	Maintenance organisation supportand certifying staff	2	Yes

3. General requirements

The training for the personnel designated in table above has to be carried out before anyairworthiness review certificate is issued or any maintenance task is certified on an aircraft or a component.

The training should be made in appropriate facilities containing examples of components,systems and parts affected by FTS issues and having access to aircraft or component where typical examples of FTS issues can be shown. The use of pictures, films and practical examples of the maintenance on fuel tank system is recommended. The trainingshall include a representative number of repair and inspections as required by the maintenance programme showing the necessity of using the manufacturer's data.

4. Characteristics of the training

The following characteristics shall be taken into consideration when the level 2 training programme are being established:

(a) understanding of the background and concepts of fuel tank safety as developed during the last 10 years, and

(b) how in maintenance organisations mechanics can recognize, interpret and handle the improvements that have been made or are being made during fuel tank system maintenance,

(c) awareness of any hazards working on the Fuel System, and especially with a Flammability Reduction System using nitrogen.

a), b) and c) should be introduced in the training programme addressing the following issues:

i) The theoretical background behind the fuel tank safety: the explosions of mixtures of fuel and air, the behavior of those mixtures in an aviation environment, the effectsof temperature and pressure, energy needed for ignition etc, the 'fire triangle', - Explain 2 concepts to prevent explosions: (1) ignition source prevention and (2) flammability reduction,

ii) The major accidents and accident investigations and their conclusions,

iii) SFARs from 14 CFR SFAR 88 of the FAA and JAA Internal Policy INT POL 25/12: reason of these documents, and what was the ultimate goal, margins of fuel system safety improvements (from 10-6 to 10-9, in fact improvement by a factor 100- 1000,to identify unsafe conditions and to correct them, to systematically improve fuel tank maintenance),

iv) Explain the concepts that are being used: the results of SFAR 88 of the FAA and JAAINT/POL 25/12: modifications, airworthiness limitations and CDCCL,

v) Where relevant information can be found by the mechanics and how to use and interpret this information (maintenance manuals, component maintenance manuals)

vi) Fuel Tank Safety and Maintenance: fuel tank entry and exit procedures, clean working environment, what is meant by configuration control, wire separation, bonding of components etc,

vii) Flammability reduction systems: reason for their presence, their effects, the hazards of an FRS using nitrogen for maintenance, safety precautions in maintenance/working with an FRS,

viii) Recording maintenance actions, recording measures and results of inspections.

DGCA application forms for licenses and examinations

Form No	Description
CA Form 19-01	Application for Initial Issue of CAR- 66 Aircraft Maintenance Engineer'sLicence
CA Form 19-02	Application for extension of CAR- 66 aircraft maintenance engineer'slicence
CA Form 19-03	Application for renewal of CAR- 66 aircraft maintenance engineer'slicence
CA Form 19-04	Application for conversion/removal of limitations of CAR- 66 aircraftmaintenance engineer's licence
CA Form 19-05	Application for issue of duplicate CAR- 66 aircraft maintenance engineer's licence
CA Form 19-06	Medical certificate
CA Form 19-07	Application for allotment of computer number for appearing in AMElicence examinations
CA Form 19-08A	Application for appearing in written paper(s) of CAR 66 basic knowledgeexamination
CA Form 19-08B	Application for appearing in CAR 66 type examination
CA Form 19-09	Application for appearing in skill test of CAR-66 AME licence
CA Form 19-10	Format of aircraft maintenance engineer work record / log book

Note: The requirements/ contents of the above forms have been incorporated/ captured in the respective eGCA service.

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