
ISLAMIC REPUBLIC OF PAKISTAN
CIVIL AVIATION AUTHORITY
(Airworthiness Directorate)

AIRWORTHINESS NOTICE

Part-IV Engineering & Maintenance

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REQUIREMENTS FOR ISSUE AND EXTENSION OF AIRCRAFT
MAINTENANCE ENGINEER LICENCES / PROFICIENCY
CERTIFICATES (P.C) / DAILY INSPECTION (D.I)
AUTHORISATION TO PILOTS

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1. INTRODUCTION

- 1.1 This Airworthiness Notice prescribes requirements for issue and extension of Aircraft Maintenance Engineer Licences, Proficiency Certificates to engineering instructors and Daily Inspection authorization to pilots in General Aviation. These requirements are not less than the corresponding minimum Standards of ICAO contained in Annex-1 (Personnel Licensing) to the Convention on International Civil Aviation. Mandatory clauses are invariably denoted by use of "shall" or "must" whereas "should" or "may" are used for permissive or recommended clauses. It is implicit in the requirements expressed qualitatively e.g. acceptable, that Civil Aviation Authority will be adjudicated in cases where doubt exists.

2. GENERAL

- 2.1 AME Licences are issued with type ratings in categories "A", "C" & "X" specified in latest issue of Airworthiness Notice No. 34. Licences in category "R" are issued without type rating. Duties and responsibility of the holder of licence with and without type ratings in various categories are specified in Airworthiness Notice No. 45.

3. ELIGIBILITY

3.1 Acceptance of application for issue/extension of AME licence requires that the applicant:-

3.1.1 Shall not be less than 21 years of age.

3.1.2 Must hold higher secondary school certificate with science subjects or equivalent qualification or equivalent technical certificate.

3.1.3 Shall provide evidence of acceptable experience and any approved training course requirements relevant to his application.

Note: Requirement of paras 3.1.2 & 5.1.2 shall be applicable to employees inducted after issue date of this Notice. Course requirements are not applicable to the groups 1,2,3,4,7,8,12,15, & 18. Course requirements for groups 19 &20 are not applicable for aircraft in General Aviation.

3.1.4 Shall pay appropriate fee.

4. ISSUE/EXTENSION OF AME LICENCE

4.1 An application on Form CAA-052 (Annex-‘E’) shall be completed showing details of the applicant’s experience. In case of extension, Form CAA-057 (Annex-‘E1’) shall be completed. The application shall be submitted to one of the Airworthiness field offices at Karachi, Lahore and Islamabad Airport.

4.2 The applicant shall submit acceptable documentary evidence (schedule of work) to substantiate experience claimed. The acceptable schedule of work is laid down in Annex "A".

4.3 The schedule of work shall show the applicant's experience that covers a representative selection of items (Annex- ‘A’) specified appropriate to his / her category, sub-category and/or type rating. Applicant’s experience shall give details of practical maintenance and/or inspection experience obtained during the period specified in Annex "B". Items and dates in the experience record should be confirmed by the supervising engineer and authenticated by Manager Engineering or equivalent concerned in case of Airline and Chief Engineer/Engineering in-charge in case of General Aviation.

4.4 The applicant shall have to submit the experience record showing maintenance experience, recent practical experience and recent type experience in case of initial issue; recent type experience in case of extension in the same category; recent practical experience and recent type experience in case of applying in other category (category on same or different aircraft).

4.5 The applicant shall have to comply with the experience requirements laid down in Annex "B" appropriate to the category, sub-category and / or type rating of licence required.

4.6 The applicant should have completed applicable CAA approved course(s) from CAA approved training centre. The course shall be valid for eight years if applicant has not passed CAA written paper.

Note: Requirement of paras 4.6 & 5.1.7 shall be applicable after two years from the issue date of this Notice.

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- 4.7 The Airworthiness field office will scrutinize the application and forward it to Airworthiness Directorate alongwith recommendations. The applicant will be informed about acceptance or otherwise of his application and date of examination. In case of rejection of application, the applicant may file an appeal to Director Airworthiness, if he can provide the justification.
 - 4.8 Applicants for AME licences are examined as per schedule given in Annexes "C & C1".
 - 4.9 Applicant shall satisfy CAA at the time of application that he/she does not suffer from any disability likely to affect his/her professional duties. This shall be in accordance with the requirements as laid down in Airworthiness Notice 61. Applicant shall have to submit medical Performa at Annex 'H'
 - 4.10 The applicant shall be first examined in basic paper appropriate to his category or sub-category. Syllabus for the basic paper is given in Annex "D1". The syllabus relevant to examinations for all licence categories is presented in this Annex as a series of subjects or combination of the subjects referred to as modules. The content of each module is specified in the above Annex. The written & oral examinations for each category of licences are based on a number of modules. The module category relationship is laid down in Annex "D".
 - 4.11 The applicant shall be examined in type paper only if he passes the basic paper.
 - 4.12 If an applicant fails in the type paper in three consecutive attempts then he will have to pass type course again.
 - 4.13 Written examination shall be conducted by Airworthiness Directorate at such time and place as notified by it.
 - 4.14 Pass marks for basic & type papers are 70% (refer Annex 'K', if low pass percentage for details regarding refresher and full course).
 - 4.15 The applicant shall appear for oral examination within two years of passing basic / type paper as appropriate. If he does not appear in the oral examination during this period he will have to re-appear in type paper as appropriate.
 - 4.16 Oral board will be constituted representing one senior manager from the operator in case of airlines and senior engineer from general aviation organisation.
 - 4.17 The Oral Examination Board will evaluate the applicant's performance in legislation, basic subjects and type subjects and will give their recommendations.
 - 4.18 An applicant who fails in examination shall not be accepted for re-examination until additional experience has been obtained and/or further course of study have been undertaken. CAA will advise the applicant for any further practical experience and / or course considered necessary, alongwith result.

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- 4.19 On the recommendations of Oral Examination Board, Airworthiness Directorate will, issue/extend the AME licence or call for re-examination as considered necessary.
 - 4.20 The applicant qualifying for issue of AME licence shall submit three coloured photographs in size 1" x 1" for issuance of licence to concerned Airworthiness field office as per Airworthiness Notice No. 53.
 - 4.21 The licence will be issued or extended in respect of only those aircraft, engines and systems, which are currently on Pakistan Civil Aircraft Register.
 - 4.22 Definitions of terms relating to practical experience and requirements for issuance of group ratings are given in Airworthiness Notice No. 35 Annex 'B'.
 - 4.23 Licence in category "R" basic airborne Radar Systems will be issued to AME holding licence in category "R" basic airborne Communication and Navigation Systems.
 - 4.24 An applicant holding licence in higher group may be exempted from type paper in lower group if he is a practicing AME for the last 12 years. He will be required to submit work schedule (experience record) of atleast 3 months on the type applied for. (This exemption is applicable to aircraft upto 5700 Kg maximum take-off weight).

**5. ISSUE AND EXTENSION OF PROFICIENCY CERTIFICATE
(P.C)**

- 5.1 **GENERAL REQUIREMENTS:** General requirements for issue & extension of Proficiency Certificate are given below:
 - 5.1.1 An applicant shall not be less than 21 years of age.
 - 5.1.2 Must hold higher secondary school certificate with science subjects or equivalent qualification or equivalent technical certificate.
 - 5.1.3 An application form CAA 590 shall be completed for ISSUE (Annex 'I') showing details of applicant's experience. In case of EXTENSION, application form CAA 591 shall be completed (annex-'J'). The application shall be submitted to respective Airworthiness field offices.
 - 5.1.4 An applicant shall submit acceptable documentary evidence to substantiate the experience claimed.
 - 5.1.5 An applicant shall have to comply with the experience requirement prescribed in the para 5.3.
 - 5.1.6 Syllabus for examination shall be same as for AME licence of appropriate category.

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- 5.1.7 Applicant shall have to successfully complete CAA approved Basic and/or Type course applicable to AME licence of appropriate category. Courses shall preferably be completed before acquiring maintenance & teaching experience on the type. The courses shall be valid for eight years if the applicant has not passed CAA written paper.
- 5.1.8 Applicant shall satisfy CAA at the time of application for P.C that he/she does not suffer from any disability likely to affect his/her professional duties. This shall be in accordance with the requirements as laid down in Airworthiness Notice 61. Applicant shall have to submit medical Performa at Annex 'H'
- 5.1.9 Application will be considered only from a person currently employed in CAA approved training organization on full time basis.
- 5.1.10 The Proficiency Certificate shall be issued or extended in respect of only those aircraft, engine and systems, which are currently on Pakistan Civil Aircraft Register.
- 5.1.11 P.C in category 'R' is issued in Basic systems. Therefore applicant in this category will be exempted from requirements as laid down in paras 5.3.1.5 & 5.3.1.7.
- 5.1.12 An applicant who failed in the previous examination shall be required to provide further experience as detailed in the result of that examination.
- 5.1.13 The applicant qualifying for issue of AME licence shall submit three coloured photographs in size 1" x 1" for issuance of licence to concerned Airworthiness field office as per Airworthiness Notice No. 53.
- 5.1.14 An instructor shall not conduct the course independently (as stated in para 5.3.1.6 and 5.3.1.7) unless he/she holds PC in that category.
- 5.2 EXAMINATION PROCEDURE:** Procedure of examination for issue and extension of P.C is given below:
- 5.2.1 The applicant shall be first examined in Basic paper.
- 5.2.2 The applicant shall be called for Type paper only if he / she has passed Basic paper.
- 5.2.3 If an applicant fails in the type paper in three consecutive attempts then he will have to pass type course again.
- 5.2.4 Written examination shall be conducted by Airworthiness Directorate at such time and place as notified by it.
- 5.2.5 An applicant qualifying both Basic and Type papers will be eligible for issue of P.C.

5.2.6 Schedule of examination shall be same as for AME licence of appropriate category.

5.3 *EXPERIENCE REQUIREMENTS:*

5.3.1 FOR ISSUE:

5.3.1.1 A minimum of 3 years Aviation experience (Aerospace or Avionics, as applicable) including teaching and practical maintenance is required.

5.3.1.2 A minimum of 2 years teaching experience under supervision (as described in sub paras 5.3.1.6 & 5.3.1.7).

5.3.1.3 A minimum of 1 year practical type maintenance experience (i.e. 6 months in Line maintenance and 6 months in Base maintenance) on the rating applied for. This experience shall be exclusive and on full time basis & will be termed as on job training (OJT).

5.3.1.4 Successful completion of approved Basic course in the relevant category.

5.3.1.5 Successful completion of approved Type course on the rating applied for.

5.3.1.6 The applicant has conducted two Basic approved courses in the category applied for. Out of these one course should be participated along with a qualified instructor, on full time basis, while the qualified instructor conducts that course. This participation shall be after successful completion of approved basic course. During this period the applicant shall prepare instructional course notes, examination questions, and conduct some portions of the course syllabus. The second course shall be conducted by the applicant in the presence of qualified supervising instructor who shall be present in the class on full time basis. These courses will be accepted only if the supervising instructor is satisfied with conduct of the course by the applicant and has cleared him (supervising instructor will issue a certificate pertaining to this effect). In case the conduct of second course by the applicant is not considered satisfactory by the supervising instructor, then clearance for further conduct of the course by the applicant will be obtained from local Airworthiness Field Office.

5.3.1.7 The applicant has conducted two Type approved courses in the category applied for. Out of these one course should be participated along with a qualified instructor, on full time basis, while the qualified instructor conducts that course. This participation shall be after successful completion of approved type course. During this period the applicant shall

prepare instructional course notes, examination questions, and conduct some portions of the course syllabus. The second course shall be conducted by the applicant in the presence of qualified supervising instructor who shall be present in the class on full time basis. These courses will be accepted only if the supervising instructor is satisfied with conduct of the course by the applicant and has cleared him (supervising instructor will issue a certificate pertaining to this effect). In case the conduct of second course by the applicant is not considered satisfactorily by the supervising instructor, then clearance for further conduct of the course by the applicant will be obtained from local Airworthiness Field Office.

Note: *Approved course means a course approved by CAA (Pak).*

5.3.1.8 The applicant has passed Basic written examination conducted by CAA (Pak) for issue of P.C / AME licence.

5.3.1.9 The applicant has passed Type written examination in relevant rating conducted by CAA (Pak) for issue of P.C / AME licence.

5.3.1.10 The applicant has passed recognised instructional technique course (course should be approved by CAA (Pak)).

Note: *"Qualified Instructor" means an instructor holding Proficiency Certificate in the relevant category.*

5.3.2 FOR EXTENSION.

5.3.2.1 An applicant holding P.C. on an aircraft and applying for extension on other aircraft in the same category shall have to comply with requirements as laid down in 5.3.1.5, 5.3.1.7 & 5.3.1.9.

5.3.2.2 An applicant must have three months practical type experience (6 weeks in line maintenance and 6 weeks in base maintenance) on type applied for. This experience will be termed as on job training (OJT)

5.3.2.3 An applicant holding P.C. on an aircraft and applying for issue of P.C. on a different category (on the same aircraft or on a different aircraft) shall have to comply with requirements as laid down in paras 5.3.1.3 through 5.3.1.9.

5.3.3 CONVERSION OF AME LICENSE TO P.C. WITH THE SAME RATING ONLY:

5.3.3.1 An applicant holding AME licence in a rating may be considered for issue of P.C. with the same rating only.

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- 5.3.3.2 The applicant has conducted one approved Basic course, in the same rating, under full time supervision of a qualified instructor. This course shall be accepted only if the supervising instructor is satisfied with the conduct of course by the applicant and has cleared him (supervising instructor will issue a certificate pertaining to this effect).
- 5.3.3.3 The applicant has conducted one approved Type maintenance course, in the same rating, under full time supervision of a qualified instructor. This course shall be accepted only if the supervising instructor is satisfied with the conduct of course by the applicant and has cleared him (supervising instructor will issue a certificate pertaining to this effect).
- 5.3.3.4 The applicant has passed recognized instructional technique course (course should be approved by CAA Pak).
- 5.3.3.5 After completion of the above mentioned requirements the applicant will be eligible to apply for P.C. Airworthiness Directorate will issue the P.C. if the applicant complies with the above stated requirements.

Note: AME applying for extension of P.C. in the same category or in other category will be required to follow the prescribed requirements for issue or extension as applicable.

6. ISSUE OF DAILY INSPECTION (D.I.) AUTHORIZATION TO PILOTS IN RESPECT OF GENERAL AVIATION AIRCRAFT.

- 6.1 Certification of D.I. by pilots at base and outstation shall be carried out only in case of non-availability of appropriately qualified AME.
- 6.2 Above certification shall be confined to General Aviation aircraft weighing upto 5,700 Kgs MTWA.
- 6.3 Pilots, holding Flight Instructor rating or 600 hours flying experience on the type, will be eligible for grant of D.I. authorisation.
- 6.4 Chief Engineer / Engineer-in-charge of an Organization holding appropriate qualification on that particular type (on which the applicant has to be tested) or the Senior Airworthiness Inspector from the Airworthiness field office nearest to his / her organization must conduct and confirm that the pilot can satisfactorily perform D.I. on the subject aircraft as per its maintenance schedule, on the format attached as Appendix "F".
- 6.5 Formal request for approval of authorization to perform D.I. on a particular type of aircraft is to be put up by the Chief Engineer to the nearest Airworthiness field office, together with prescribed fee and the

certification proforma (Annex "F") for having cleared D.I authorization test.

- 6.6 On receipt of the formal request from the pilot as per sub-para (6.5), the Airworthiness field office will issue the D.I authorization Card and send a copy to Headquarters Airworthiness Directorate CAA, QIAP, Karachi Airport for retention as record in the pilot's personal file.
- 6.7 Daily Inspection certification will be made on the relevant D.I. Check-sheet which is attached to and forms part of the aircraft document.
- 6.8 The D.I. authorization Card will be submitted annually by the pilot to the nearest Airworthiness field office for re-validation. After re-validation of the D.I. authorization Card the Airworthiness field office will inform of the extended date to the Airworthiness Directorate.
- 6.9 This D.I. authorization will be valid only if the pilot so authorized is included in the flight crew of the subject aircraft.

7. CANCELLATION

- 7.1 This Airworthiness Notice supercedes the requirements prescribed in CAA publication No. CAA/AW-1 Edition: March 1984 and all previous correspondence related to the subject of this Airworthiness Notice.

8. AUTHORITY

- 8.1 This Airworthiness Notice has been issued under the authority vested in DG CAA vide rule 4 & 51 of Civil Aviation Rules 1994.

(M. IDREES MALIK)
Air Commodore (Retd)
Director Airworthiness
for Director General
Civil Aviation Authority

Annexes

(i)	Schedule of work	Annex "A"
(ii)	Experience requirements	Annex "B"
(iii)	Schedule of examination	Annex "C & C1"
(iv)	Syllabus for AME examination	Annex "D & D1"
(v)	Application Form CAA 502 for issue of AME Licence	Annex "E"
(vi)	Application Form CAA 057 for extension of AME Licence	Annex "E1"
(vii)	Application Form for issue of D.I authorization.	Annex "F"
(viii)	Schedule of work (experience record Performa).	Annex "G"
(ix)	Medical Certificate Performa	Annex "H"
(x)	Application Form CAA 590 for issue of P.C.	Annex "I"
(xi)	Application Form CAA 591 for extension of PC.	Annex "J"
(xii)	Policy regarding standard of written examination	Annex "K"

SCHEDULE OF WORK

The schedule of work shall include a representative selection of items of work carried out, or participated in, under each of the ***following sub-headings*** appropriate to the category, sub-category and / or type rating for which application is made. The experience record properly certified / verified shall be submitted alongwith application for issue / extension of AME licence.

1. FOR CATEGORY 'A'

- 1-1 Airframe structure, including doors and windows.
- 1-2 Flight control systems (including control surfaces).
- 1-3 Hydraulic systems.
- 1-4 Pneumatic system.
- 1-5 Landing gear system.
- 1-6 Air conditioning and pressurising systems.
- 1-7 Ice and rain protection system.
- 1-8 Life saving and safety equipments.
- 1-9 Ground handling.
- 1-10 Minor repairs.
- 1-11 Defect analysis and rectification.
- 1-12 Current Mandatory modification /inspections.
- 1-13 Water and waste system.
- 1-14 Fuel system.
- 1-15 L.R.U replacements.
- 1-16 Rotor control systems as applicable.

2. FOR CATEGORY 'C'

- 2-1 Power plant structure.
- 2-2 Auxiliary power units and other propulsive devices as applicable.
- 2-3 Engine fuel feed systems.
- 2-4 Water methanol system as applicable.
- 2-5 Oil systems.
- 2-6 Ignition systems.
- 2-7 Propeller systems.
- 2-8 Air intake systems.
- 2-9 Thrust reverser, re-heat and exhaust systems.

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- 2-10 Ice and rain protection systems.
 - 2-11 Fire detection and protection systems.
 - 2-12 Defect analysis and rectification.
 - 2-13 Replacement of main engines, auxiliary power units and other propulsive devices as applicable.
 - 2-14 Ground running and adjustments.
 - 2-15 Current mandatory modifications and inspections.
 - 2-16 L.R.U replacements.

3. FOR CATEGORY 'X' ELECTRICAL INSTALLATIONS

- 3-1 A.C power generation and distribution systems.
- 3-2 D.C. power generation and distribution systems.
- 3-3 Batteries.
- 3-4 Circuit installation, testing and protections.
- 3-5 Ignition system.
- 3-6 Engine starting systems.
- 3-7 Engine and propeller, and / or rotor control systems.
- 3-8 Fuel systems.
- 3-9 Oil systems.
- 3-10 Fire protection systems.
- 3-11 Ice and rain protection systems.
- 3-12 Air conditioning and pressurising systems.
- 3-13 Flight control systems.
- 3-14 Hydraulic and / or pneumatic systems.
- 3-15 Landing gear systems.
- 3-16 Defect analysis and rectification.
- 3-17 Current mandatory modification and inspections.
- 3-18 L.R.U replacements.
- 3-19 Oxygen system.

4. FOR CATEGORY 'X' INSTRUMENTS, AUTO PILOT & REMOTE COMPASS

- 4-1 Circuit installation and testing.
- 4-2 Pressure indicating systems.
- 4-3 Temperature indicating systems.
- 4-4 Pitot static systems.

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- 4-5 Quantity indicating systems.
 - 4-6 Flow indicating systems.
 - 4-7 Position indicating systems.
 - 4-8 Gyro instrument systems.
 - 4-9 Integrated flight systems.
 - 4-10 Air data sensor/ computer systems.
 - 4-11 Inertial navigation systems.
 - 4-12 Flight recording systems.
 - 4-13 Defect analysis and rectification.
 - 4-14 Current Mandatory modification and inspections.
 - 4-15 L.R.U replacements.

Note: The schedule of work (experience record for auto-pilot category) shall cover the main items detailed in the syllabus together with details of installation, inspection, adjustment, testing and defect rectification relevant to the type rating for which application is made.

5. FOR CATEGORY 'X' COMPASSES

The schedule of work should cover the main items detailed in the syllabus together with details of installation, inspection, testing, swinging, compensation, adjustment and defect analysis and rectification relevant to the type Rating for which application is made.

6. FOR CATEGORY 'R' RADIO SYSTEMS

The schedule of work should cover the installation, inspection, adjustment, testing, defect analysis and rectification of the Radio systems installed on an aircraft.

**EXPERIENCE REQUIREMENTS FOR
ISSUE AND EXTENSION OF AME LICENCES**

Application for grant of the licence in any category must show confirmed minimum specific period of maintenance experience relating to the maintenance of operating aircraft.

- (i) Maintenance experience means experience gained whilst maintaining operating aircraft & not in shops or on non-flying aircraft. The term shop means a set-up where CAA does not issue licence. The maintenance experience accepted by CAA will be only of those aircraft, engines and systems, which are currently on the Pakistan Civil Aircraft Register.
- (ii) Recent practical experience means the experience gained within 2 years from the date of application on category applied for.
- (iii) Recent type experience means the hands-on floor experience exclusively gained on particular type performing maintenance/major checks. Recent type experience is counted from the date of acquiring previous rating to the date of application for current rating.
- (iv) If a candidate **Actually** works on more than one type of aircraft/category/equipment simultaneously. He will be eligible to claim **Recent Practical experience** relevant to different categories. ("Recent practical experience" is an experience in a category like Airframe, Gas Turbine Engine, Electrical, Instruments, Communication & Navigation and Radar Systems irrespective of the type of Aircraft).
 - (a) Concurrent experience cannot be claimed for more than two ratings. Concurrent experience shall not be acceptable on aircraft exceeding 5700 kg MTWA.
 - (b) For first rating the experience will not be apportioned and the applicable experience may be counted as if acquired on one category only.
 - (c) For second rating the recent practical experience, in excess of the amount required for first category, may be divided by two for counting towards category applied for.
- (v) The maintenance experience requirement will be counted from the date mentioned in joining report of applicant (date of absorption after successful completion of apprenticeship training in case of apprentices) in the concerned maintenance section of the organization. Maintenance experience requirements in the following charts are "minimum" acceptable requirements and must be fully adhered to.

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- (vi) The experience gained at out station (line station other than base) may be included in recent practical experience / recent practical type experience if:-
 - (a) Aircraft transits at that station and refueling is involved for that type.
 - (b) For complete coverage of check cards of that type of aircraft / engine / equipment the applicant would be required to accomplish the task at base station.
 - (c) Comprehensive coverage of Line Replaceable Units is ensured.
 - (d) Other experience requirements mentioned in the tables under the heading “complete coverage of cards” are met.
 - (vii) The operator will submit details of programmed OJT to be completed by the applicant as a pre requisite for the acceptance of their applications.
 - (viii) The requirements prescribed by the operator for issue of class I approval for aircraft certification shall not be less restrictive than those prescribed by CAA in Airworthiness Notice No. 35.
 - (ix) All applicants initially holding class I shop approval shall obtain NOC from Airworthiness HQ (Licensing cell) through respective field offices prior to gaining maintenance experience.
 - (x) Person certifying experience shall ensure that maintenance experience is genuinely acquired. Any false certification may require initiation of penal action against the person certifying as per Rule 333 & 334 of CAR 94.

TABLE 1 Experience required for grant & extension of Licences in category "A" Airframe

Type of Aircraft specified in	Maintenance Experience	Recent Practical Experience	Recent Practical type Experience	Complete coverage of cards required
GROUP 1 A Unpressurised aircraft with fixed landing gear not exceeding 2730 Kg .	03 years	01 year	06 months	-
GROUP 1 B Unpressurised aircraft with fixed landing gear not exceeding 5700 Kg .	03 years	01 year	09 months	-
GROUP 2 Pressurised aircraft with fixed landing gear.	03 years	01 year	09 months	-
GROUP 3 Unpressurised aircraft with retractable landing gear.	03 years	01 year	09 months	-
GROUP 4 Pressurised aircraft with retractable landing gear below 5700 Kg .	03 years	01 year	01 year	-
GROUP 5A DeHavilland DHC 6-300 Beechcraft-200 Cessna 406 Cessna-441	03 years	02 year	09 months	-
GROUP 5B Fokker F-27	03 years	02 year	09 months and 6 weeks OJT*	Check "B"
GROUP 6A Lear Jet 31A Beech Jet 400A	03 years	02 year	01 year	-
GROUP 6B Boeing 707 Boeing 737-300 BAC 1-11	03 years	02 year	01 year and 6 weeks OJT*	12 FBC's Check "4A" Check "B"
GROUP 6C A300B4 A310-300	03 years	02 year	01 year and 6 weeks OJT*	Check "C"

Note:

- For complete coverage of check cards, the card coverage must not exceed one area per check at one time.
- *OJT is applicable to all applicants (other than line maintenance / line stations applicants)
- For aircraft falling in groups 1,2,3 & 4, the applicant will have to submit recent type experience on atleast one aircraft for obtaining qualification in the concerned group.

TABLE 2 Experience required for grant & extension of Licences in category "C" Engine

Type of Engine specified in	Maintenance Experience	Recent Practical Experience	Recent Practical type Experience	Complete coverage of cards required
GROUP 7 A Unsupercharged reciprocating piston engine fitted with fixed pitch propeller not exceeding 2730 Kg .	03 years	01 year	06 months	20 G/R
GROUP 7 B Unsupercharged reciprocating piston engine fitted with variable pitch propeller not exceeding 2730 Kg.	03 years	01 year	06 months	20 G/R
GROUP 8 A Supercharged reciprocating piston engine fitted with variable pitch propeller not exceeding 2730 Kg.	03 years	01 year	09 months	20 G/R
GROUP 8 B Supercharged reciprocating piston engine fitted with variable pitch propeller exceeding 2730 Kg and below 5700 Kg.	03 years	01 year	09 months	20 G/R
GROUP 9 A Pratt & Whitney PT6A 27 & 41 Garrett TPE 331-8 Pratt & Whitney PT6A-112	03 years	02 year	09 months	20 G/R & familiarity with BSI & trend monitoring system
GROUP 9 B Rolls Royce Dart 532 Series	03 years	02 year	09 months and 06 weeks OJT*	20 G/R 06 R/I of engine 06 R/I of propeller 02 BSI chk "B"
GROUP 10 A Pratt & Whitney JT 15D Garrett TFE 731-2-3B	03 years	02 year	09 months	20 G/R & familiarity with BSI & trend monitoring system
GROUP 10 B Pratt & Whitney JT 3D-3B Snecma CFM 56-3 Rolls Royce Spey MK 512-14 DW	03 years	02 year	01 year and 06 weeks OJT*	20 G/R Check "4A" 04R/I 04BSI
GROUP 10 C General Electric CF6-80C2 General Electric CF6-50C2/E2	03 years	02 year	01 year and 06 weeks OJT**	20 G/R Check "C" 04R/I 04BSI

Notes:

- R/I Stands for Removal / Installation.
- G/R stands for Ground Run.
- For complete coverage of check cards, the card coverage must not exceed one area per check at one time.
- *OJT is applicable to all applicants (other than line maintenance / line stations applicants).
- For aircraft falling in groups 7A, 7B, 8A & 8B the applicant will have to submit recent type experience on atleast one aircraft for obtaining qualification in the concerned group.

**TABLE 3 Experience required for grant & extension of Licences in category "A & C"
Rotorcraft**

Type of Rotorcraft	Maintenance Experience	Recent Practical Experience	Recent Practical type Experience	Complete coverage of cards required
GROUP 11 BELL 206 & 412 with engines	03 years	2 years maintenance / major checks of rotorcraft airframe and engine	1 year maintenance / major checks of rotorcraft air-frame and on gas turbine engine installed on rotorcraft	6 scheduled maint. Checks 12 complete G/R 02 BSI of engine 02 R/I of engine and should be familiar with Trend Monitoring System, engine and airframe controls rigging and adjustments, compliance of S.B's, modifications, etc., and defect rectifications

Notes:

- In view of engagement of Helicopter rotor when its engine is run for ground testing, it is required a pilot holding valid licence on the type should only perform that such engine operation on Helicopter.
- R/I Stands for Removal / Installation.
- G/R stands for Ground Run.
- BSI stands for Boroscopic Inspection.

TABLE 4 Experience required for grant & extension of Licence in category "X" Electrical

Type of Aircraft specified in	Maintenance Experience	Recent Practical Experience	Recent Practical type Experience	Complete coverage of cards required
GROUP 12 A Unpressurised fixed landing gear.	03 years	01 year	06 months	-
GROUP 12 B Pressurised fixed landing gear.	03 years	01 year	09 months	-
GROUP 12 C Unpressurised retractable landing gear.	03 years	01 year	09 months	-
GROUP 12 D Pressurised retractable landing gear.	03 years	01 year	01 year	-
GROUP 13A DeHavilland DHC 6-300 Beechcraft-200 Cessna 406 Cessna-441	03 years	02 year	09 months	-
GROUP 13B Fokker F-27	03 years	02 year	09 months and 06 weeks OJT*	Check "B"
GROUP 13 C Bell 206 Bell 412	03 years	02 year	01 year	6 scheduled maint. Checks & compliance of S.B's, modifications, etc., and defect rectifications
GROUP 14A Lear Jet 31A Beech Jet 400A	03 years	02 year	09 months	-
GROUP 14B Boeing-707 Boeing 737-300 ** BAC 1-11	03 years	02 year	01 year and 06 weeks OJT*	12 FBC's Check "4A" Check "B"
GROUP 14C Airbus A-310-300 Airbus A300B4	03 years	02 year	01 year and 06 weeks OJT*	Check "C"

Note:

- For complete coverage of check cards, the card coverage must not exceed one area per check at one time.
- *OJT is applicable to all applicants (other than line maintenance / line stations applicants).
- ** Avionics licensing requirements for B737-300 (EFIS fitted) aircraft are :
 - a) Must hold full set category 'X' electrical / instrument licence on B737-300 being currently operated and
 - b) Must have attended and successfully completed CAA approved B737-300 electrical / instrument (EFIS fitted) difference course.

Note: Similar requirements are also applicable for grant of proficiency certificate in category 'X' and 'R' to instructors and inspection authorisation in category 'R'.

- For aircraft falling in groups 12A, 12B, 12C & 12D the applicant shall submit recent type experience on atleast one aircraft for obtaining qualification in the concerned group.

TABLE 5 Experience required for grant & extension of Licences in category "X" Instruments, Autopilot and remote compass

Type of Aircraft specified in	Maintenance Experience	Recent Practical Experience	Recent Practical type Experience	Complete coverage of cards required
GROUP 15 A Unpressurised fixed landing gear.	03 years	01 year	06 months	-
GROUP 15 B Pressurised fixed landing gear.	03 years	01 year	09 months	-
GROUP 15 C Unpressurised retractable landing gear.	03 years	01 year	09 months	-
GROUP 15 D Pressurised retractable landing gear.	03 years	01 year	01 year	-
GROUP 16A DeHavilland DHC 6-300 Beechcraft-200 Cessna 406 Cessna-441	03 years	02 year	09 months	-
GROUP 16 B Fokker F-27	03 years	02 year	09months and 06 weeks OJT*	Check "B"
GROUP 16 C Bell 206 Bell 412	03 years	02 year	01 year	6 scheduled maint. Checks & compliance of S.B's, modifications, etc., and defect rectifications.
GROUP 17A Lear Jet 31A Beech Jet 400A	03 years	02 year	09months	-
GROUP 17B Boeing 707 (including INS & Boeing 737-300 (including FMS & Remote Compass) BAC 1-11	03 years	02 year	01 year and 06 weeks OJT*	12 FBC's Check "4A" Check "B"
GROUP 17C Airbus A-310-300 including FMS Airbus A300B4 including AFCS	03 years	02 year	01 year and 06 weeks OJT*	Check "C"

Note:

- For complete coverage of check cards, the card coverage must not exceed one area per check at one time.
- *OJT is applicable to all applicants (other than line maintenance / line stations applicants)
- ** Avionics licensing requirements for B737-300(EFIS fitted) aircraft are :
 - a) Must hold full set category 'X' electrical / instrument licence on B737-300 being currently operated and
 - b) Must have attended and successfully completed CAA approved B737-300 electrical / instrument (EFIS fitted) difference course.
- Note:** Similar requirements are also applicable for grant of proficiency certificate in category 'X' and 'R' to instructors and inspection authorisation in category 'R'.
- For aircraft falling in groups 15A,15B,15C & 15D, the applicant will have to submit recent type experience on atleast one aircraft for obtaining qualification in the concerned group.
- GPWS is part of instruments.

TABLE 6 Experience required for grant & extension of Licence in category "X" D.R Compass	
GROUP 18	
A minimum of one year maintenance experience. This must include:-	
(a)	Installation and compensation of 12 D.R compasses.
(b)	Installation and compensation of 03 D.R compasses within the proceeding 6 months.

TABLE 7 Experience required for grant & extension of licence in category "R" Basic Com. & Nav. Systems.				
Type of Aircraft specified in	Maintenance Experience	Recent Practical Experience	Recent Practical type Experience	Complete coverage of cards required
GROUP 19 VHF HF Voice Recorder Audio Equipment VLF CW Hyperbolic Equipment ADF VOR ILS IFE ELT SAT. COMM	03 years	02 years	01 year and 06 weeks OJT*	Refer to note below
Note: Experience of major checks (relevant to category applied for) as follows :-				
(i) 12 FBC's if working on Boeing 707/720B.				
(ii) Check "B" if working on F-27.				
(iii) Complete coverage of "B" check cards for B-737-300 & BAC1-11 aircraft.				
(iv) Complete coverage of "C" check cards for A-310.				
(v) Highest check of maintenance schedule for General Aviation Aircraft.				
(vi) For complete coverage of check cards, the card coverage must not exceed one area per check at one time.				
(vii) *OJT is applicable to all applicants (other than line maintenance / line stations applicants)				
(viii) OJT is not applicable to General Aviation applicants.				

TABLE 8 Experience required for grant & extension of Licence in category "R" Basic Radar Systems

Type of Aircraft specified in	Maintenance Experience	Recent Practical Experience	Recent Practical type Experience	Complete coverage of cards required
GROUP 20 Weather Radar DME Loran Doppler ATC Transponder Mode-S transponder Radio Altimeter TCAS GPS	03 years	02 years	01 year and 06 weeks OJT*	Refer to note below

Note:

Experience of major checks (relevant to category applied for) as follows :-

- (i) 12 FBC's if working on Boeing 707/720B.
- (ii) Check "B" if working on F-27.
- (iii) Complete coverage of "B" check cards for B-737-300 & BAC1-11 aircraft.
- (iv) Complete coverage of "C" check cards for A-310.
- (v) Highest check of maintenance schedule for General Aviation Aircraft.
- (vi) For complete coverage of check cards, the card coverage must not exceed one area per check at one time.
- (ix) *OJT is applicable to all applicants (other than line maintenance / line stations applicants)
- (x) ** Avionics licensing requirements for B737-300 (EFIS fitted) aircraft are :
 - (a) Must hold full set category 'X' electrical / instrument licence on B737-300 being currently operated and
 - (b) Must have attended and successfully completed CAA approved B737-300 electrical / instrument (EFIS fitted) difference course.

Note: Similar requirements are also applicable for grant of proficiency certificate in category 'X' and 'R' to instructors and inspection authorisation in category 'R'.

- (xi) OJT is not applicable to General Aviation applicants.

SCHEDULE OF AME EXAMINATION

AME licence examinations are conducted four times in a year, at intervals of 3 months. Two sessions each are reserved for Aerospace & Avionics and as per schedule given below: -

- i) March Session (Aerospace)
- ii) June Session (Avionics)
- iii) September Session (Aerospace)
- iv) December Session (Avionics)

2. In case of any other operational requirements, arrangements may be made for conducting special examination to meet exigency of service or to meet the contractual agreement with foreign Airlines. In such cases matter should be referred to Airworthiness Directorate at least one month in advance of the proposed date of examination.

3. Date of Basic paper is communicated at the time of issue of final acceptance list whereas date of type paper is communicated along with the result of Basic paper. The date of oral examination is communicated along with result of type paper.

4. Tentative schedule for actions required for the above mentioned sessions are shown in Annex C1.

ANNEX-' C'1

<u>S. No.</u>	<u>AEROSPACE SESSION</u>	<u>MARCH SESSION</u>	<u>SEPT. SESSION</u>
1.	AME application submission to field offices.	1 st January	1 st July
2.	AME application submission to HQ.	20 th January	20 th July
3.	List of candidates for examination.	31 st January	31 st July
4.	Appeals	10 th February	10 th August
5.	Final list of candidates for examination.	14 th February	15 th August
6.	Basic examination date	24 th February	25 th August
7.	Type examination date	3 rd March	3 rd September
8.	Oral examination date	10 th March	10 th September
9.	<u>Final Result</u>	31 st March	30 September

<u>S. No.</u>	<u>AVIONICS SESSION</u>	<u>JUNE SESSION</u>	<u>DEC. SESSION</u>
1.	AME application submission to field offices.	1 st April	1 st October
2.	AME application submission to HQ.	20 th April	20 th October
3.	List of candidates for examination.	30 th April	30 th October
4.	Appeals	11 th May	10 th November
5.	Final list of candidates for examination.	16 th May	14 th November
6.	<u>Basic examination date</u>	26 th May	25 th November
7.	Type examination date	6 th June	5 th December
8.	Oral examination date	16 th June	15 th December
9.	Final Result	30 st March	31 st December

Note: Any event falling either on public holiday or Saturday/Sunday shall be held on next working day.

ANNEX-'DI'

MODULE 1
REGULATIONS

- 1.1 Knowledge of Civil Airworthiness Requirements, Pakistan Civil Aviation Rules 1994, Air Navigation Orders and Airworthiness Notices, as appropriate to the duties of licensed Aircraft Maintenance Engineer.

MODULE 2
BASIC: AIRCRAFT/ENGINES

- 2.1 A working knowledge of drawing details - common practices: plan, elevations, isometric, sections, scale, dimensional and indicating presentation; use, validity control, interpretation; a working knowledge regarding maintenance manuals, parts catalogues, overhaul manuals; service bulletin and modification data; maintenance schedules: approved and otherwise; fail safe-safe life, hardtime, O.C, C.M concepts, knowledge of major and minor repairs, ATA specifications etc.
- 2.2 A working knowledge of practical mathematics involving simple calculations: measurements, angles, graphs, metric/imperial, volume, density, specific gravity, pressure, forces, moments, centre of gravity; resolution of forces; pressure/volume/temperature of gases; a working knowledge of terms regarding hydraulics: basic principles, liquids in flow and static conditions; the atmosphere- density /pressure /temperature /altitude /humidity; basic principles of motion, acceleration, centrifugal, centripetal forces, friction.
- 2.3 A working knowledge of lubrication methods and application; hand tools, simple machine tools; Go/No Go gauges, fits and clearances; precision measuring instruments; torque loading; assessment of in service condition of soldered, brazed and welded joints; inhibiting and corrosion protection; painting and paint stripping; fire protection and safety in and around the workshop/hanger/aircraft; storage and handling.
- 2.4 Common Parts:- Control cables and fittings; fastening devices- threaded, riveted and swaged; V-band clamps and couplings, Locking: parts and methods, bearings, pipes: rigid and flexible, keys and key ways, worm drive and other types of band clips.
- 2.5 A knowledge of gases and compounds, air, nitrogen, carbon dioxide, oxygen, helium, acetylene; safety aspects, adhesives, oils, greases, sealing compounds.
- 2.6 A general knowledge of metals; light alloys, iron and steel, titanium, brass, bronze, copper, lead; recognition and general characteristics of metals used, application and use of metals, purpose of heat treatments, uses of different heat treated materials, anodic treatments, corrosion treatments during manufacture, identification of corrosion, treatments during repair, fatigue, other protective treatments/finishes.
- 2.7 A general understanding of non-destructive, condition-testing:- Typical uses and display of defects using: X ray/gamma ray, ultrasonic, eddy current, magnetic particle; penetrant leaching; visual probes; eyeglass equipment: usefulness, effectiveness of various magnifications.

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- 2.8 A general knowledge of basic electricity: general principles and practices, simple circuits a.c. to d.c., d.c. to a.c., a.c. to a.c. conversion, insulation and conductivity, common items used in aircraft applications, e.g. resistors, potentiometers, solenoids, transformers, semiconductors, capacitors, relays, micro switches, proximity detectors, fuses, circuit breakers, motors/actuators; principles of frequency wild, constant frequency a.c. power, circuit wiring, connectors, crimping, clipping, cable sizes and types, bonding, static electricity; lightning; static charges; 'interference' effects on radio equipment.
- 2.9 A general knowledge of environment aspects: Effects of snow, ice, lightning and turbulence.

MODULE 3
CATEGORY-A- COMMON- AEROPLANES/
ROTORCRAFT

- 3.1 Knowledge of basic aerofoil theory:- Lift/thrust/drag/weight; stalling of an aerofoil; induced and parasite drag; boundary layer; aerofoil shapes; Chord/span/aspect ratio.
- 3.2 A working knowledge of sub-structures:- Folded metal, sheet metal, extrusions, tubing, effect of swaging, lightening holes, use of different metals, commonly used fasteners and joint methods, protective treatments and precautions, honeycomb, reinforced plastic/epoxy materials, applications, floors; seats-crew, passenger-"crash" situation; aerials, pitot probes, drain masts, air intakes and similar structural fitments; instrument panels and consoles; radio and equipment racks and stowages.
- 3.3 A general knowledge of reinforced plastics/epoxy composites:- Glass, fibre and filament reinforcement, materials used, cold setting, hot setting systems, construction principles used, aircraft applications, failure characteristics, honeycomb, foam sandwich.
- 3.4 Hydraulic:- Simple systems, i.e. powered pump, reverse selection, pressure relief, pressure regulation LP and HP filters; types of pump, differing fluids-mineral/fire-resistant; control and indication methods.
- 3.5 Electrical:- Simpler type systems, batteries, generators, relays, wiring, voltage control, current limiting, paralleling a.c. from inverters, crimping, soldered joints, control and indications.
- 3.6 Landing Gear and Brakes:- Wheels, tyres, shock absorbers castering, steering methods; simple hydraulic brakes, i.e. master cylinder to wheel-brake unit, brake discs and calipers; landing and braking energy conversion.
- 3.7 A general knowledge of radio VHF communication system.
- 3.8 Safety Equipment:- Fire extinguishers-hand held; life jackets, life rafts; seat belts/harness-passenger/crew, 3-point, 4-point, inertial, lapstraps; mandatory requirements for upper torso restraint.

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- 3.9 Ground Handling:- Jacking, trestling, slinging, towing, tie down 'Servicing' activities, storage; painting-protective finish/external markings; weighing and centre of gravity determination-weighing report; scale positions; basic weight; unusable fuel; oil and other consumable liquids-quantities; role variations; hold/seat row/removable equipment; station identification; C of G datum.
- 3.10 Instruments:- Pitot/static systems and associated instruments; gyro instruments-vacuum/ pressure/electrical; pressure and temperature indication, position indication, compasses.

MODULE 4
CATEGORY 'A' - AEROPLANES 1 AND AEROPLANES 2

- 4.1 Knowledge of theory of flight and control regarding stability and control, equilibrium, stalling of the aircraft, flaps and slats, aerodynamic balance, mass balance, aileron/elevator/rudder control, tabs-servo/anti-servo/balance/anti-balance/ trim/spring, canard/foreplanes.
- 4.2 A general knowledge regarding aircraft structures:- Main structures-fuselage/wing, stressed skin- diaphragms and longerons, tubular structures, skin, frames and stiffening wing: spar and rib structures, integral fuel tanks, load paths, empennage, windows, doors and hatches.
- 4.3 Knowledge regarding wood types, wood application and uses; wood diseases-environmental effects, plywoods, glues-past and present, storage and condition control, damage-failure modes, painting/protective finishes.
- 4.4 Knowledge regarding fabrics: natural and man-made materials-types, applications and uses, techniques used during covering, repairs, paint finishes and protective treatments, butrate and nitrate paints, ageing, tautening, heat shrinking, strength considerations, drainage and apertures, stitching, stringing, adhesives, testing.
- 4.5 Flight controls:- Aileron, elevator, rudder, operating systems and surfaces - manually operated, trim operating systems and surfaces-manual and electric; flap systems - electrical, hydraulic and manual; flap systems-pneumatic; simple asymmetric protection; slat systems-automatic and manual; hydraulic; tab systems-trim, balance servo, anti-servo, anti-balance, spring servo; stall sensing and warning-simple systems, e.g. vane or reed types; basic auto pilots-simple systems; inputs into main controls-function testing-attitude, heading and height sensing;
- 4.6 Heating and Ventilation:- combustion heaters, exhaust heat exchangers; ram air; ventilation fans.
- 4.7 Ice and Rain Protection:- Liquid, electric and boot systems, power source, control and indication, windscreen wipers, electrically-heated windscreens.

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- 4.8 Pressurization:- Simple systems-bleed air, turbocharger bleed; passenger environmental requirements for the control of:- oxygen, heating, ventilation, rate of change, humidity; mass flow control; temperature control; differential pressure-maximum, negative; control and indication; cabin structure, windows and doors for pressurized flight.
 - 4.9 Oxygen:- Bottle storage, distribution, regulation masks; safety features and requirements.
 - 4.10 Vacuum/Pressure:- Dry and wet pump systems; oil separation; gyro supply; relief valve; filtering; aerofoil anti-icing.
 - 4.11 Pneumatic:- Landing gear/flaps/brakes; operating systems; basic theory and common practices.

MODULE 5
CATEGORY 'A' AEROPLANES 2 ONLY

- 5.1 Knowledge of theory of flight and control regarding transonic effects, swept wings, wing fences, spoilers, high lift devices, vortex generators; high speed stall; shock wave, speed of sound - mach numbers; wake turbulence supersonics- sound waves; delta wing forms, kinetic heating; C of G control; active controls- computerized flight management systems-general principles.
- 5.2 A working knowledge regarding aircraft structures:- Fail-safe application; fatigue effects and control; wing: box/integral tank construction; pressure-loaded skin, bulkheads, windows, windscreens, doors; milling/chemical etch constructed structures; bonded type construction Fasteners - close tolerance Sealing compounds; maintenance programs - structural surveys, NDT programs large aircraft paint and protective finishing processes, cargo holds venting and draining sound proofing.
- 5.3 Furnishing:- Upholstery, toilet and galley partitioning, carpets and curtains, particle boards and plastic laminates, fire resistance/escape requirements, passenger seats, crew seats-cabin and flight crew.
- 5.4 Hydraulic:- Variable delivery systems; accumulator/cut-out dependent systems; pressure/volume control; pressure-reducing valves; fire-resistant fluids -temperature, contamination, compatibility; pressurized reservoirs; multiple system provision; alternate systems ~ hydraulic motors; electrically-powered and air-driven systems; leak protection systems-system isolation, 'fused' system, priority control; internal leakage-cause and effects-acceptability.
- 5.5 Flight Control:- Powered controls; spoiler, air/speed brake, lift dump; lift augmentation - LE droop; slats/flaps; flap operating systems - large transport aircraft; flap asymmetric and alternate operation; stall sensing-stick shake; Stick push/nudge; Electronic control systems.
- 5.6 Pneumatic System:- Bleed air pneumatic systems; systems supplied; bleed air valves; mass, flow, pressure and temperature control and indication; ditching; leak detection; alternate supply - APU and ground cart.

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- 5.7 Landing Gear System:- Multiple axles and wheels; bogey beams; door sequencing Main and alternate brake provision; anti-skid system - electronic and mechanical; aquaplaning; landing gear unsafe protection; alternate lowering; weight on/weight off sensing; fire protection; powered steering-retraction - self centering; auto braking.
 - 5.8 Ice and Rain Protection:- Mainplane / tail hot air anti-ice systems control and indication; leak / overheat detection / protection; ice detection; rain repellent; windscreen wipers; laminated windscreen heating; waste water discharge; pitot/static sensors.
 - 5.9 Air Conditioning:- Cabin blower/bleed air supply; heat exchangers; cold air units/air cycle machines; vapour cycle systems; humidity control systems, mass flow, pressure and temperature control and indication; leakage detection and protection; ventilation requirements passenger service unit air supply; water extraction; re-circulation
 - 5.10 Oxygen:- Storage, distribution and charging; drop-out system; chemical systems; therapeutic provision; masks passenger / crew/ smoke bottle checks and precautions.
 - 5.11 Pressurisation:- Outflow control-electric, electronic and pneumatic; maximum differential and negative pressure control; cabin altitude and rate of change; emergency dump and manual control; ditching; cabin altitude warning; entrance/access/baggage door; sealing and locking, indications and warnings.
 - 5.12 Toilet waste and water, galley services:- Toilets: servicing provision; toilet flushing systems - pump overheat protection; water- washing, hot/cold, potable; potable water-health protection; pressure control; water heating systems - safety provisions; waste collection and drainage; galleys - refrigerators, food and drink, ice - health protection; lifts, safety factors catering trolleys.
 - 5.13 Pressurisation:- Outflow control-electric, electronic and pneumatic; maximum differential and negative pressure control; cabin altitude and rate of change; emergency dump and manual control; ditching; cabin altitude warning; entrance/access/baggage door; sealing and locking, indications and warnings.
 - 5.14 A working knowledge of baggage automatic loading & unloading systems-pallets and containers; restraint and securing; Dangerous goods.
 - 5.15 A working knowledge of entertainment and passenger service, films, video, television and audio Public address.
 - 5.16 Electrical Supply:- 3-phase A.C power generation systems:- Control and protection, transformer rectifier units, cables and terminations; basic electronics-hardware-printed circuit boards; built-in-testing provisions; static inverters; multiplex-basic principles; logic-basic principles.

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- 5.17 Instruments:- ADI, HSI presentation and ground functioning; altitude encoding and transponder systems-general; computer inputs; centralised air data units CRT displays; flight recorders- voice recorders; inertial navigation system.
- 5.18 Safety equipment:- Slides, rafts; dinghies; portable oxygen; loud hailers; smoke masks / hoods; survival equipment; notices / placards; all mandatory emergency equipment.

MODULE 6
CATEGORY 'C' PISTON ENGINES IN
AEROPLANES/ ROTORCRAFT

- 6.1 Knowledge of theory of flight and control regarding principles, terminology, definitions and laws of normally aspirated and supercharged operation; four stroke cycle; ignition timing, mixture, fuel grade. Detonation; power; overhaul periods/continuation in service beyond overhaul; recommendation; ground principles and running problems; effect of altitude, humidity, temperature, and icing; standard atmosphere, pressure, altitude; fixed and variable pitch propeller effects (not rotorcraft); vibration characteristics; type certification.
- 6.2 A working knowledge of general arrangement – internal, general arrangement- external, crankcase breathing, propeller shaft sealing, materials, fixed pitch propeller provision (not rotorcraft), power take-off provision, (rotorcraft/airships) cooling, cylinders, pistons and valve gear, hydraulic tappets, camshaft, casings, mountings and accessories drive.
- 6.3 A general knowledge of carburation and induction:- Air intake-normal/ alternate -filtering, manifolds, anti-icing provision, float type and injection systems, engine driven fuel pumps, priming systems, mixture/idle cut-off/throttle control.
- 6.4 Starting:-Starter motors-manual, bendix, solenoid, pre-engaged-engagement methods; non-engagement indication and effects; starter relays; earth straps; cooling; effects on battery.
- 6.5 Ignition system:- Magnetos; ignition harness; spark plugs-reach variations, operating temperatures-long life; switch control; timing (internal/external) ; advancing and retarding mechanisms; screening; starting aids-impulse couplings and ignition boosting.
- 6.6 Fire Protection and Indication:-Extinguishing, bottles, cartridges, life control detection systems and warnings, two shot provision.
- 6.6 A working knowledge of lubrication regarding, wet and dry sump systems; system arrangement; pressure control; effects of hot and cold weather; filtering; straight, detergent, ash dispersant oils; engine condition assessment using oil system analysis; propeller feathering systems (not rotorcraft or airships; oil coolers- temperature control valves; hoses, rigid pipes, internal passages, splash- oil jet; cooling functions of the oil system.

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- 6.8 Supercharging/Turbo-charging:- Directly driven and exhaust driven superchargers, manual and automatic control, lubrication and hydraulic power, controls and indication, automatic control systems.
 - 6.9 Aircraft Fuel:- Tanks, cells and integral systems; venting; fuel pumps-electrical; fuel grades and quality; MOGAS; water contamination-drains; filtering; controls and indications.
 - 6.10 A general knowledge of engine instruments:- Manifold pressure; rotational speed; pressure and temperature; cylinder head temperature; exhaust gas temperature.
 - 6.11 Engine Controls:- Throttle; mixture; propeller (non rotorcraft) ; alternate air; manual controls for turbocharger.
 - 6.12. Propellers-fixed pitch (not Rotorcraft):- Material, diameter- minimum /maximum, protective finishes, damage areas, cropping, balance control, attachment, spinners, alternative types-different, manufacturer/pitch.

MODULE 7

CATEGORY 'C' VARIABLE PITCH PROPELLERS - PISTON ENGINES IN AEROPLANES/AIRSHIPS, TURBINE ENGINES IN AEROPLANES

- 7.1 A general knowledge of principles, technology, definitions and laws regarding constant speeding pitch variation; ground and flight functioning characteristics; power conversion; blade forces: aerodynamic and centrifugal; aerofoil aerodynamic principles; pitch coarse/fine, high/low, reverse; feathering; vibration characteristics; turbine engine installation propeller systems.
- 7.2 A general knowledge of constructional arrangement:- Pitch change mechanism single/ double acting; CSUs/governors; balance control; materials; diameter- minimum and maximum; pitch stops - fixed, centrifugal, manual and electrical; protective finishes- contour control; damage acceptance areas; attachment and assembly methods; oil transfer - governor/propeller/ sump; safety visibility.
- 7.3 Pitch Control System:- Pilot control and governor sensing, feathering.
- 7.4 Turbine Engine application (not airship):- Auto-feathering; synchronising /synchrophasing; braking , automatic and manually controlled, pitch limiting systems; beta control; permitted balancing.

MODULE 8

CATEGORY 'C' - TURBINE ENGINES IN AEROPLANES/ ROTORCRAFT

- 8.1 A knowledge of principles, terminology, definitions and laws regarding gas flow path- temperature, velocity and pressure; compression; combustion; turbine power extraction; effects of atmospheric variations in temperature, density, pressure altitude on engine and on engine/aircraft combination;

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- single shaft, two and three shaft engines; centrifugal and axial flow compressors; fan engines; by-pass engines; water/water methanol injection; power turbines surge/compressor stalling; propeller turbines; gas producers; APU applications; thrust reversal power assessment.
- 8.2 A knowledge of constructional arrangement:- Casings; shafts, bearing, accessories drive; air intakes and compressors; combustion section turbines and exhaust; materials; modular construction; engine inspection capability and condition assessment provision, principles of 'condition monitored' and 'on condition maintenance programs, supersonic flight air intake geometry control systems.
- 8.3 Thrust Reversing (not rotorcraft):- General arrangements; control /interlocks; safety features; operating systems - hydraulic/ pneumatic mechanical; turbine and fan applications.
- 8.4 Propeller and Shaft Power Provisions:- Gas producers, reduction gearing; power and auxiliary drive; rotational speed and power control, safety systems; principles of torque/power/rotational speed in power transmission by rotating shafts.
- 8.5 Fuel Control:- Principles-parameters, mechanical/electronic control, power speed-control and limiting, temperature and power factors, burners-primary and secondary provision; burners-shaft injection, torch, ignition, governor speed sensing.
- 8.6 APUs:- General arrangements; intake and exhausts systems- door operation; load control; electrical output control and management; speed control; fuel control; safety features; ground/flight/altitude-limiting factors; mounting; fire protection and indication; bay cooling; ground running.
- 8.7 Water Injection (not rotorcraft):- Water/water methanol applications; sensing, control and safety provision; power effects; tankage; replenishing / dumping, pumps, effects on fuel control; pipes and pipes lines.
- 8.8 Fuel system:- Tanks-cells and integral systems, refueling / defueling, crossfeed, jettison, venting, transfer; scavenging-jet pumps, boost pumps; backing pumps; LP/HP valves and control; tank selection; internal/external pipes, hoses, connectors; fuel types; static electricity-effects and control; leak assessment and control; fuel quantity indication-'Level Sticks'; water contamination-effects and control; specific gravity/density/volume/weight; filtering and heating; fuel system in pressurized cabin areas.
- 8.9 A knowledge of lubrication regarding tanks, storage, venting, contents indication; pressure/scavenge pumps, filter, screen and magnetic plugs/chip detectors, Pressure/flow control, heat exchangers oil/fuel, oil/air; sealing-labyrinth seals, carbon seals, etc.; overboard drains-drains systems; lubrication of main bearings, accessories and gear trains; supply to propeller systems; contamination by hydraulic fluid/fuel; types of oil; internal/external pipes, hoses and passages-effects of heat; use of oil for ice protection-intake and fuel control.

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- 8.10 Surge Protection and Airflow Control:- Bleed valves-operating systems; variable inlet guide vanes-scheduling, operating systems; surge sensing "Surge margins", supersonic flight air intake geometry control.
- 8.11 Cooling, Sealing, and Bleed Air Service:- Internal cooling-external cooling, sealing air; overboard dump-temperature monitoring; off-takes for other services ~ air conditioning, anti-icing. equipment drive, pressurizing of hydraulic reservoirs, water systems, etc. centrifugal fillers.
- 8.12 Ice Protection:- Hot air systems-struts and intakes; electrical systems engine and intakes; use of oil and air bleeds; pressure sensor heating; control and indication.
- 8.13 Fire Protection:- Fire detection; overheat warning; fire extinguishing; bay and zone isolation; fire walls, bulkheads, cladding; fire wires, detector units; single/dual detection; extinguishants; first and second shot capability; warning and indications-lights, aural warnings, fuse types, squib test; 'bottle discharge indicators; operating systems; over pressure; cartridges-life control; Electric and electronic systems.
- 8.14 Starting:- Starting cycle; initiation-HP valves, termination, bleed valves, starter valves, power lever, self sustaining speeds; starter motors-electrical, pneumatic, starter/generators-HP air, impingement air; clutch provision, overspeed sensing ; manual operation starter cooling/ resting; ground power electrical/pneumatic provisions.
- 8.15 Controls:- Power/throttle/thrust reverse; HP/LP valve controls-manual and electric; condition control systems; propeller control (not rotorcraft); auto control of throttle; electronic control systems.
- 8.16 Ignition:- High energy ignition systems; torch ignition; glow plug systems; igniter plugs and leads; operation inside and outside the starting cycle.
- 8.17 Pods, Pylons, Cowlings and Mountings:- General arrangements; services and controls-input/exit; materials; venting; zone demarcation; mountings; pylon and pod structural features ;torque, vibration, expansion provisions; bay venting; cooling air intakes.
- 8.18 Electrical :- A.C. generators - constant speed drives / integrated drive generators; starter/generators; starter motor high current circuits';CSDs - principles of operation, disconnect/reconnect, lubrication/ hydraulic operation, filters, coolers.
- 8.19 A knowledge of ground handling:- Storage and inhibiting spare engine carriage; ground running-noise control-power checking; functional checks of engine associated services.
- 8.20 Instruments:- Rotational speed indication; a.c. generator and pulse probe systems; temperature and pressure systems; pressure ratio systems; turbine temperature systems; instrument system amplifiers; fuel flow indication; torque indication; fuel contents / oil contents-electrical and electronic; vibration indication.

MODULE 9
CATEGORY 'A/C - ROTORCRAFT

- 9.1 A knowledge of theory of flight and control regarding rotor disc: forces acting, lift, drag, centrifugal force, weight, rotor useful force, phase lag; advance angle non-constant speed drive (Hookes Joint) effect; articulated/semi-rigid/rigid rotors; flapping /dragging / feathering; climbing/losing height/horizontal flight, main and anti-torque rotors -control inputs - cyclic and collective; effects of aircraft speed on rotors; directional control; translational lift/inflow/ground effect; vortex ring effect; retreating blade stall; reverse flow; auto-rotation; auto-rotative force/blade section; auto-rotation rev/min; twin rotors.
- 9.2 A knowledge of constructional arrangements:- Rotorcraft structures, load paths, vibration effects; landing gear configurations: skids/wheels/floats; fuselages, tail cones, pylons, engine mounts; gearbox and transmission mountings; doors and windows.
- 9.3 Flight Controls:- Collective/cyclic/directional; hydraulic; rotor head-main and tail rotor; articulated, rigid, semi-rigid, teetering, swash plate/spider control input methods; blades: construction and materials; balancing: static, dynamic, span, wise, chord wise; tracking: flag and in-flight methods; tabs/trailing edge bending; vibration-effects and analysis; BIM indicators; automatic pilots/Autostabilizers-control interface; system components-component, replacement and subsequent testing.
- 9.4 Transmission Systems:- Engines to rotors: shafts, clutches, free wheel units; reduction gearboxes; main transmission/ gearboxes, combining gearboxes; tail rotor drive: drive shafts, intermediate gearboxes, tail rotor gearboxes; lubrication systems: oils, coolers, cooling fans, filters, magnetic plugs, chip detectors, pumps, pressure control; universal drive provision; splined shafts, type of gears - tooth pattern; instrumentation; rotor brake systems.
- 9.5 Ice and Rain Protection Systems:-Windscreen wipers, electrically-heated windscreens.
- 9.6 Heating and Ventilation:- Exhaust heat exchangers, ram air, ventilation fans.
- 9.7 Instrument:- ADI, HSI; flight Recorders; HUMs.
- 9.8 A knowledge of equipment:- Hoists and winches; external load carrying; flotation; survival systems; specialized role equipments, aerial spraying, cameras

MODULE 11
CATEGORY 'B' -AEROPLANES/ROTORCRAFT

- 11.1 A knowledge of regulations:- mandatory requirements for modifications/ inspection, markings, equipment, Flight Manual - provision of manuals and documents, prototypes, modified prototypes, series aircraft, acceptability of foreign type certification, modification standard- recording, relevance of previous maintenance records, build standard, public transport - operator's responsibilities, loading, performance, categories of flight, glider towing, parachuting, aerial application, exits and break-in markings, documents to be carried, record to be kept, production and preservation of records, offences in relation to documents and records.
- 11.2 Refurbish / Overhaul of aircraft:- Preparation of the aircraft - cleaning, access dismantling, jacking and trestling, furnishing removal; preparation of inspection reports and establishment of work required; final inspection- preparation of final reports and records/log book entries, mandatory modifications, inspections, service bulletins, Airworthiness Directives applicable to the type rating sought.
- 11.3 A knowledge of facilities;- Preparation and layout of workshops, care, use and checking for accuracy of test equipment.
- 11.4 A knowledge of welding:- Use and application, approved welders - limitations, periodic testing, support - pre-heating - pressure relief, cleaning and preparation, fluxes and filler/welding rods, gas and specialist welding principles, materials, strength of welded joints, inspection before, during and after welding, pre- and post-treatments, equipment.
- 11.5 Overhaul / Repair of Parts / Components:- Overhaul data - requirements, documentation, work sheets, inspection stages, testing, use and control of workshop, inspection aids including non-destructive test equipment, factors and limitations affecting choice of equipment and methods used, overhaul and testing procedures for component / parts of pneumatic, hydraulic, air conditions, oxygen, anti-icing, de-icing, fire extinguishing and rotorcraft transmission systems, assembly procedures and approved repair schemes applicable to major components, engine mounting structures, inspections necessary before, during and after repair, including checking of alignment and symmetry, repair, inspection and testing of tanks, heat exchangers, fuel and oil systems, and all types of control systems relevant to a Category 'B' Licence.
- 11.6 Brazing / Hard Soldering:- Use and application, support, pre-heating, pressure relief, cleaning and preparation, fluxes - fillers /spelter, materials, equipment.

MODULE 13
HUMAN PERFORMANCE

- 13.1 A general knowledge of the need to take human factors into account, incidents attributable to human factors/human error 'Murphy's' Law.
- 13.2 A general knowledge of human performance and limitations regarding, Vision, hearing, information processing, attention and perception, memory, claustrophobia and physical access.
- 13.3 A general knowledge of social psychology:- Responsibility: individual and group, motivation and de-motivation, peer pressure, 'culture' issues, team working, management, supervision and leadership.
- 13.4 Factors affecting performance:- Fitness/health, stress: domestic and work related; time pressure and deadlines; workload: overload and underload; sleep and fatigue, shiftwork; alcohol, medication, drug abuse.
- 13.5 Tasks:-Physical work; repetitive tasks; visual inspection; complex systems.
- 13.6 Communication:- Within and between teams, work logging and recording, keeping upto date, currency, dissemination of information.
- 13.7 Physical Environment:- Noise and fumes, illumination, climate and temperature, motion and vibration, working environment.
- 13.8 Hazards in the workplace:- Recognising and avoiding hazards, dealing with emergencies.
- 13.9 Human Error:-Error models and theories, types of error in maintenance tasks, implications of errors (i.e. accidents), avoiding and managing errors.

MODULE 20
COMMON — CATEGORIES 'X'/'R'

- 20.1 A working knowledge of engineering drawings regarding use, validity control; wiring diagram manuals, interconnection charts, schematic diagrams.
- 20.2 A knowledge of technical information, service bulletins, modifications, manuals, schedules.
- 20.3 A general knowledge of mathematics, simple calculations, measurements, angles, graphs, transposition of formulae, volume, density, pressure, powers of numbers, binary notation. simple equations, conversion of units, SI/I imperial.
- 20.4 Tools:- Hand tools, simple machine tools, precision mechanical instruments, crimping tools, hand and hydraulic.
- 20.5 Common Practices:- Torque loading, corrosion protection, metal contamination, storage and handling, fire protection, general safety, earthing of aircraft and bonding, aircraft handling, towing and mooring, ground services, a.c. and d.c; soldering, crimping, electrostatic damage protection, cable looms, harnesses, terminations and disconnects.

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- 20.6 A general knowledge regarding fasteners, locking devices, washers, pipes, rigid and flexible, bearings, adhesives, solvents, oils, greases, safety precautions.
 - 20.7 Digital Techniques:- Logics - basic gate functions and truth tables, microprocessors-block diagram, digital computing techniques, parallel and serial operation, volatile non-volatile data storage, multiplex systems.
 - 20.8 A knowledge of electrical theory:- General principles, basic laws, units, power in circuits, magnetism, simple D.C. and A.C. circuit calculations, insulators, conductors, semiconductors, circuit elements and symbols, transformers-single phase. 3-phase, auto-transformers, transistors-biasing, simple circuit arrangements, amplifiers — signal amplifiers, feedback, synchros-current transformers differential, torque synchros and resolvers, switch gear, relays, circuit protection devices, magnetic indicators and annunciators, batteries-applications and handling, electrical measuring instruments, circuit testing methods.

MODULE 21
BASIC: ELECTRICAL EQUIPMENT AND SYSTEMS

- 21.1 A working knowledge of batteries, principles of primary and secondary cells, lead-acid types, Ni-cad types, methods of charging batteries in aircraft, capacity testing, storage.
- 21.2 Direct current machines:- Basic laws and principles, types and characteristics, control.
- 21.3 Direct Current Generation:- Voltage regulation, control, load sharing, paralleling, system layouts interlock circuits.
- 21.4 Fire Protection:- Detection systems, fire and overheat warning, smoke detectors-principles and applications, overheat sensors, extinguishing systems, warnings.
- 21.5 Fuel System:- Boost pumps control and indication, jettison systems, refuel/defuel systems, fuel heaters, crossfeed, supply and shut-off valves- normal and emergency.
- 21.6 Power Conversion equipment:- Static and rotary inverters, transformer rectifier units.
- 21.7 Hydraulic System:- Pump control and isolation, pressure switches, overheat warnings, electrically-operated priority valves, fluid reservoir components, low level warnings.
- 21.8 Landing Gear Systems:- Actuation motors-selection and control, indication-proximity sensors, micro switches, air/ground sensor systems, anti-skid systems-operation, control and override, automatic braking systems - inputs: control and override.

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- 21.9 Lighting Systems:- External systems; landing, navigation. anti-collision and inspection, etc, internal systems: normal and emergency, fluorescent tubes, reading and passenger information systems, multiplex function.
- 21.10 Pneumatics:- Control - Indication and protection.
- 21.11 A general knowledge of engine and propeller Control:- Fuel control valves, temperature and speed limiting systems, propeller feathering controls, electronic engine control.
- 21.12 Starting and Ignition:- System types, control, principles of operation of high energy ignition units, aircraft and engine applications and related systems, e.g. stall warning.
- 21.13 Flight Control:- Motors and actuators-clutches and brakes, limit switches, micro switches and proximity detectors, power control units, flap motors protection and control, trim motors.
- 21.14 Alternating Current Machines;- Basic laws and principles, types and characteristics, control.
- 21.15 Alternating Current Power Generation:- Constant and variable frequency, constant speed drive units, paralleling, load sharing, load shedding, generator control unit, voltage regulation, load controller, differential protection, fault and test panels, voltage, frequency and excitation control and protection.
- 21.16 Alternating current power distribution systems:- Bus-bar layouts, split and parallel systems, transfer relay interlocks, emergency conditions, APU and GPU interlocks, warnings, maintenance panels.
- 21.17 Air-conditioning System:- Control, indication, protection.
- 21.18 Ice and Rain Protection:- Windscreen heating: control, indication and failure, Engine/propeller and airframe anti-ice protection: thermal, electrical and pneumatic, warnings and indications, overheat indications and protection, ground operations, windscreen wiper, washer and rain-repellant systems, sensor protection-angle of airflow, pitot head, static plate and temperature probes, waste water heaters- thermal anti-icing protection, aerial heaters.
- 21.19 APU's:- Starting, control, protection, power generation, fire protection.
- 21.20 Ground Power Supplies:- Interlocks and protection of aircraft supplies, control.
- 21.21 Centralised Warning and Indication Systems:- Inputs, output warnings, priority philosophy.
- 21.22 Galley / Toilet Services:- Power supply and protection, water heating, equipment.

MODULE 22
BASIC: INSTRUMENTS CATEGORY ^X'

- 22.1 A working knowledge of pitot-static systems and instruments:- Atmospheric physics, temperature lapse rate, mach number computation, airspeed indicator, altimeter, vertical speed indicator, and machmeter, servo altimeter, pitot probes, static plates and heaters, pipelines and flexible hoses, drain traps, associated equipment, altitude and airspeed switches.
- 22.2 Rate of Turn and Slip Indication:-Rotor speed, display.
- 22.3 Pressure Measurement:- Sensing elements: capsules, bellows, diaphragms, bourdon tubes, transmitters, displays.
- 22.4 Vacuum Systems:- Sources, control and adjustment, indication.
- 22.5 Position Measurement D.C. and A.C. systems.
- 22.6 Rotational Speed Measurement;- Direct drive indicators; tacho-generator and indicator systems; pulse probe systems, displays.
- 22.7 Quantity Measurement:- Direct reading, electrical and electronic systems, compensation, power supplies.
- 22.8 Flow Measurement:- Indicators, transmitters, power supplies.
- 22.9 Compasses:- Direct reading compass, installation; safe distance, flux detectors and remote sensors, remote system components, heading reference outputs.
- 22.10 Temperature Measurement;- Variable resistance, thermocouples; compensation; limits and values; servo indicators; control system inputs.
- 22.11 Air Data Computation:- Sensors and inputs, signal processors: mechanical, electrical and electronic, signal outputs and displays.
- 22.12 Electronic Display Systems:- CRT; LED; LCD displays, electronic attitude direction indicator; electronic horizontal situation indicator; symbol generators, control panels, comparators and monitors, engine indicating and crew alerting systems, electronic centralized aircraft monitors.
- 22.13 Flight Path Computation;- Signal sources, radio inputs modes, computation, displays.
- 22.14 Flight Data Recorders:- Requirements, sensors and inputs, cockpit voice recorder inputs, interface with aircraft systems, signal processing, entry panels, computer principles, data recording methods, retrieval and verification, readout, failure monitors.
- 22.15 Inertial Navigation Systems:- Basic principles, platform construction, computation, displays and interface with aircraft equipment, mode selector and control display unit, operation: fault code analysis, power supplies and cooling.

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- 22.16 Inertial Reference Systems:- Basic principles.
- 22.17 Vibration Measurement:- Types of pick-up, signal conditioning, displays, alarm levels and warnings.
- 22.18 Ground proximity warning systems:- Modes, warnings, inputs and interface with other aircraft systems, computation, monitors, failure indications.

MODULE 23

BASIC GYROSCOPES AND SERVOMECHANISMS CATEGORY 'X'

- 23.1 A knowledge of gyroscopes;- Basic principles, types and methods of operation-vacuum, electrical, or laser, handling care; attitude sensing:-errors, correction, remote gyros, interconnections and transfers, limits; direction sensing: errors, compensation, remote gyros, interconnection and transfers; rate sensing: alignment, rotor speeds.
- 23.2 A general knowledge of accelerometers, basic principles.
- 23.3 A general knowledge of servomechanisms:- Rate and position sensing and control, integrators, response and damping, power requirements, clutches, override and lockout protection, null and loop error sensing, synchronisation systems, force rebalance systems.

MODULE 24

AUTOMATIC PILOTS - AEROPLANES CATEGORY 'X'

- 24.1 A general knowledge of theory of flight regarding forces on the aircraft, stability - dihedral, sweepback, etc. control axis, primary control surfaces- operation and effect on the aircraft, secondary controls, forces during turns, functions of trim tabs, balance tabs and servo tabs; high speed buffet and stall conditions; auto-pilot control axis; auto-stabilizers - wing levellers; co-ordinated turns, aileron/rudder; cross feed; versine generation and application; sideslip; monitors-slip and skid in a turn; turbulence penetration and the effect on autopilot control.
- 24.2 Yaw Dampers:- Dutch roll phenomenon, yaw sensing, yaw signal processing, synchronization, series and parallel systems, cockpit indication, aileron/rudder control interaction in turns; rudder PCU, LRU's; interlocks with autopilot systems.
- 24.3 A knowledge of pitch trim systems:-Longitudinal axis stability, high speed tuck, mach no. inputs.
- 24.4 Mach trim actuators computation, connections with aircraft controls, warnings.
- 24.5 C of G Trimmers:- Computation and indication.

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- 24.6 Alpha Trim:- Angle of attack sensing, computation; interface with other aircraft systems: e.g. N_1 computers - stall warning systems, flight directors.
 - 24.7 Demand Signals:- Control wheel steering systems, touch wheel steering systems.
 - 24.8 Auto Stabilizers:- Trim actuators - control and safety interlocks, speed change systems for trim actuators, interlocks, elevator/ stabilizer interaction.

MODULE 25
AUTOMATIC PILOTS - COMMON - CATEGORY 'X'

- 25.1 A knowledge of error signals:-Rate system - errors and control; displacement system - errors and control; heading and course error inputs, radio beam deviation inputs, attitude inputs, CADC/autopilot interface -e.g. q or % adaptation; sideslip sensors and monitors.
- 25.2 A knowledge of signal processing:- Typical channel signal flow path, buffer amps, input signal modulation, summing points, signal sensors and switching functions, integrators, limiters, gain programmers, dual channel monitors, voter systems.
- 25.3 Demand Signals:- Mode selectors, control display units, turn controllers, control column transducers, command override systems, mode compatibility, mode annunciators, failure and disconnect lights and aural warnings; interlocks - pre- and post-engage, pitch attitude trim, roll out/heading-hold, engage; synchronisation; trim monitors and indicators; altitude hold inputs; vertical speed control; Mach/IAS hold; altitude acquire or change systems.
- 25.4 Command Signal Output:- Power control units - line replaceable units; solenoid valves, transfer valves position sensors, servomotors-construction, interconnection with control runs; clutches - torque settings, brakes; tachogenerators-feedback and damping; position feedback- indication, torque limiting; hardover sensing- disconnection, jam detection; runaway conditions-disconnection; pilot override- disconnection.

MODULE 26
AUTOMATIC PILOTS - ROTORCRAFT - CATEGORY 'X'

- 26.1 A knowledge of theory of flight (Rotorcraft) regarding rotor disc: forces, lift, drag, centrifugal force, weight, phase lag; articulated/semi-rigid/rigid rotors flapping/dragging/feathering; vertical and translational flight; main and anti-torque rotors, control inputs cyclic, collective, rudder pedals; directional control; autorotation; forward speed effects.
- 26.2 A knowledge of manual/automatic, indication.
- 26.3 A knowledge of stability augmentation systems:- Actuators, indicators, computation.
- 26.4 A knowledge of command outputs:- Actuators, indicators.

MODULE 27
INSTRUMENTS/AUTOMATIC PILOTS - CATEGORY 'X'

- 27.1 A general knowledge of automatic throttle systems regarding control inputs, related engine controls, sensors, engine coupling units: clutches and servo-motors; override and safety considerations; modes of operation; electronic engine control: microprocessor inputs and control.
- 27.2 Digital Flight Systems:- Flight management systems.
- 27.3 A knowledge of automatic landing systems:-Principles, requirements and approach categories, types of system operational: dual or triple channel; system operation on approach; monitors and failure conditions; roll-out control; BITE.

MODULE 30
COMPASS COMPENSATION

- 30.1 A knowledge of compass compensation:- Base survey techniques; compass swinging areas; aircraft magnetism; terrestrial magnetism – variation; methods and procedures for swinging compasses; flux valve operation; deviation: calculations and effects on a compass; compensation and adjustment procedures; various compass types.

MODULE 31
RADIO COMMUNICATION AND NAVIGATION - CATEGORY 'R'

- 31.1 A knowledge of radio theory regarding propagation of radio waves; polarisation; radiation patterns; transmitters and receivers RFamps, IFamps; oscillators, frequency synthesizers, frequency multipliers; mixers, detectors, beat frequency oscillator, automatic generation control; noise limiters, muting circuits, audio amplifiers; modulators, RF power amplifiers matching units; filters and tuned circuits.
- 31.2 Interference:- Principles and methods used to minimize the effects of conducted and radiated interference; methods used to minimize the effects of lightning strikes and static on aerials.
- 31.3 Aerial and Feeders:- Diplexers, baluns and matching stubs; fixed and variable matching arrangements; locations and types of aerials-communication and navigation; bandwidth and effective height of an aerial.
- 31.4 Audio Systems:- Intercommunication; audio mixing and distribution systems; public address and entertainment systems; headsets and microphones.
- 31.5 Communication:- Calculation of standing wave ratio; control and monitoring circuits.
- 31.6 Cockpit Voice Recorder:- Signal sources; control circuitry; hot microphone; requirements.
- 31.7 VOR / ILS:- Ground station signals; airborne installations; control; monitors; indicators; loading AFCS and instrument interface.

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- 31.8 Marker:- Ground installations; airborne systems.
 - 31.9 Automatic Direction Finding:- Receiver; loop and sense aerials and feeders; bearing errors and correction devices; loop swings.
 - 31.10 VHF / HF Communication:- Airborne installations.
 - 31.11 Satellite Communication and Navigation (GPS) Systems:- Airborne installations; receiver, computer; displays; interface with other systems.
 - 31.12 Micro Wave Landing Systems(TRSB):- Receiver, computer, interface with other systems.
 - 31.13 R NAV:- Computer; interface with other systems, indications.
 - 31.14. Flight Compartment Electronic Display Systems:-electronic attitude direction indicator; electronic horizontal situation indication; symbol generators; control panels; compactors and monitors.

MODULE 32
RADAR SYSTEMS – CATEGORY 'R'

- 32.1 A knowledge of pulse techniques regarding radar transmitter / receiver; pulse modulation; peak power, average power; duty cycle, pulse shape, pulse width; pulse rise time and repetition; frequency; range accuracy and resolution; receiver bandwidth; noise.
- 32.2 A knowledge of primary radar regarding weather radar: Control and monitoring circuits, indicators, displays, scanners, wave-guides; doppler: aerials, indicators, Interface with other equipment; radio altimeters: Pulse and frequency modulation continuous waves systems.
- 32.3 A knowledge of secondary radar regarding DME: Indicators, control and monitor circuits, interface with other aircraft systems; ATC Transponder: instrument system interface, Control and monitor circuits; TCAS.



ANNEX-'E'
CAA - 052 (Rev-IV)

CIVIL AVIATION AUTHORITY
(AIRWORTHINESS DIRECTORATE)

APPLICATION FOR ISSUE OF AIRCRAFT MAINTENANCE
ENGINEER'S LICENCE

1. Full Name (Block Letter) _____ S/D of _____
2. Age _____ 3. Nationality _____
4. National Identity Card No. (For Pak Nationals only) _____
5. Permanent Address _____
6. Present Address _____
7. Did you apply for the Category & sub category / Type of aircraft, engine or equipment in the past. If so, give following details.

S.No	Category & Sub-category Type of aircraft engine or equipment	Date of Examination	Result	Remarks

8. Are you holder of Aircraft Maintenance Engineer's Licence issued by a Country Other than Pakistan. If so, state:-
 - (i) Issuing Authority _____ (ii) Date of issue _____
 - (iii) Country of Issue _____
 - (iv) Scope of Licence _____
 - (v) Number of Licence _____ (vi) Validity _____
9. State with dates full particulars of employment and / or apprenticeship (Including service in Armed Force, if applicable) together with any practical experience gained during studentship at any aeronautical institution.

S.No	Category & Sub-category Type of A/c engine or equipment.	Position held, precise nature of work and name of organisation. State name of employer and place of employment	Period		Confirmed by. (*)
			from	To	

**Statement must be confirmed by a person in authoritative position. Person certifying experience shall ensure that maintenance experience is genuinely acquired. Any false certification may require initiation of penal action against the person certifying as per Rule 333 & 334 of CAR 94.*

10. Give particulars of licence for which you wish to make application.
 - (i) Category & Sub-Category.
 - (ii) Type of Aircraft, Engine or equipment, if applicable _____
11. Is there any shop approval already held by you, Yes No , if yes:
 - (i) Give details and when it was acquired _____
 - (ii) Have you gained NOC from Airworthiness HQ (licensing cell) prior to gaining maintenance experience. Yes No
12. I desire to be examined at KARACHI / ISLAMABAD / LAHORE. _____
13. I have the studied the following:-
 - (i) Convention of International Civil Aviation & its relevant annexes.
 - (ii) Civil Aviation Rules 1994.
 - (iii) Air Navigation Orders (ANO's).
 - (iv) Airworthiness Notices.

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14. My Academic / Technical Qualification is _____
15. Do you have a medical certificate confirming you to be free from physical and mental disability. (Y/N)
16. My Date of Birth. _____
17. Enclosures:
I hereby enclose the following along-with this form.
- | | |
|---------------------------------|--|
| (a) Receipt of fee. | (e) Joining report**. |
| (b) Work Schedule. | (f) Matriculation Certificate |
| (c) Courses Certificate. | (g) Higher Secondary School Certificate /equivalent qualification / equivalent technical certificate |
| (d) Medical fitness certificate | |

** letter showing Induction / absorption (in case of apprentices) as regular employee in the concerned maintenance Section.

18. Declaration:
- (i) I hereby declare that the above particulars are true in every respect.
 - (ii) I hereby certify that three years maintenance experience has been exclusively gained on the floor.
 - (iii) I was not detailed in any other section during the preceding 3 years which does not fall with in the scope of maintenance experience requirements as specified in Annex 'B' para (i) of Airworthiness Notice No. 35.

Signature of Applicant _____
Date _____
Place _____

Note:

- (i) This form should be filled in duplicate and submitted to the nearest Airworthiness field Office along-with documentary evidence of qualification & experience claimed herein.
- (ii) The applicant may be called upon to produce documentary evidence in original in support of the experience and qualification claimed by him, if required.
- (iii) All applicants initially holding class I shop approval shall obtain NOC from Airworthiness HQ (Licensing cell) through respective field offices prior to gaining maintenance experience.

INSTRUCTIONS:-

- (i) Applicants released from Armed Forces must forward with this application their Discharge Record or Release Book.
- (ii) Licence granted by a Country other than Pakistan should be forwarded with this application.
- (iii) Evidence regarding date of birth should be forwarded along-with this application.
- (iv) (a) Fee are prescribed in current issue of Airworthiness Notice No. 3.
(b) Fee must be deposited in the Habib Bank Limited / Civil Aviation Authority Branch Karachi for credit to the Civil Aviation Authority collection account No. 1 through prescribed deposit slip. In case of applicant outside Pakistan, fee must be paid through Bank draft in the name of Civil Aviation Authority Collection account No. 1 in Pak. Currency. The Draft should specify 'Payable at Karachi; if it is not possible to get Draft in Pak. Rupees then it should be in U.S. Dollars.

(FOR USE IN CIVIL AVIATION AUTHORITY)

Remarks. _____

Recommendation _____

Signature _____
Name _____
Designation _____
Date _____
Place _____



CIVIL AVIATION AUTHORITY
(AIRWORTHINESS DIRECTORATE)

**APPLICATION FOR RENEWAL AND EXTENSION OF AIRCRAFT
MAINTENANCE ENGINEER'S LICENCE**

1. Full Name (Block Letter) _____ Son of _____
2. Permanent Address _____
3. Present Address _____
4. Name of Employer and date of employment. _____
5. Employed at _____ 6. Employed as _____
7. Licence No. if any. _____
8. Approval held, if any. _____
9. Approximate date of last certification as A.M.E. _____
10. Precise nature of employment, quoting type(s) of Aircraft, Engine or equipment and appropriate dates:

Equipment details	Type of eqpt. On which employed	Period		Confirmed by (*)
		From	To	
(a) Airframe Maintenance. (b) Airframe major repair and overhaul. (c) Engine maintenance. (d) Engine overhaul. (e) Electrical / Instrument Autopilot / Compasses maintenance. (f) Communication / Navigation / Pulse maintenance.				

**Statement must be confirmed by a person in authoritative position. Person certifying experience shall ensure that maintenance experience is genuinely acquired. Any false certification may require initiation of penal action against the person certifying as per Rule 333 & 334 of CAR 94.*

11. Are you conversant with current (i) Civil Aviation Rules 1994 (ii) Air Navigation Orders (ANO'S) (iii) Airworthiness Notices.
12. Do you have copies of all current Airworthiness Notices YES / NO.
If No. state missing numbers.
13. Do you have a medical certificate confirming you to be free from physical and mental disability. (Yes / No)
14. Are you holders of Aircraft Maintenance Engineer's Licence issued by a Country OTHER THEN Pakistan if so, state:-
 - (i) Issuing Authority _____ (ii) Date of issue _____
 - (iii) Country of Issue _____
 - (iv) Scope of Licence _____
 - (v) Number of Licence _____ (vi) Validity _____
15. Nature of Application:
 - (a) State whether for Renewal or for Extension. _____
 - (b) If renewal is required, give date of expiry of licence _____
 - (c) If extension is required give particulars (i) and (ii) below:-
 - (i) Category and Sub-category.
 - (ii) Type of Aircraft, Engine or Equipment, if applicable.
16. Have you applied for any class I approval. Yes No if yes; please give details and when it was applied _____

17. When did you last acquire the class I approval _____

18. Did you apply for the Category & Sub-Category / Type of Aircraft, engine or equipment in the past. give following details.

S.No	Category & Sub-category Type of Aircraft, engine or equipment.	Date of Examination	RESULT	REMARKS

19. Enclosures:

I hereby enclose the following along-with this form:

- (a) CAA Form 29
- (b) CAA Form 29 B
- (c) Receipt of fee.
- (d) Work Schedule.
- (e) Course Certificate (Given details below)
- (f) Medical fitness certificate

20. Declaration:

I hereby declare that the above particulars are true in every respect.

Signature of Applicant _____

Date _____

Note: The form should be filled in duplicate and submitted to the nearest Airworthiness field Office.

INSTRUCTIONS:-

- (i) Aircraft Maintenance Engineer's Licences are valid for a period of two years and are then subject to renewal. The holder of a licence who applies for the renewal thereof may be required to satisfy all or any of the requirements, which for the time being are applicable for issue of an AME Licence.
- (ii) (a) Fees are prescribed in current issue of Airworthiness Notice No. 3.
(b) Fee must be deposited in the Habib Bank Limited / Civil Aviation Authority Branch Karachi for credit to the Civil Aviation Authority collection account No. 1 through prescribed deposit slip. In case of applicant outside Pakistan, fee must be paid through Bank draft in the name of Civil Aviation Authority Collection account No. 1 in Pak. Currency. The Draft should specify 'Payable at Karachi; if it is not possible to get Draft in Pak. Rupees then it should be in U.S. Dollars.
- (iii) Application for renewal must reach Airworthiness field Office at least 14 days before the date of expiry of licence.

(FOR USE IN CIVIL AVIATION AUTHORITY)

Remarks. _____

Recommendation _____

Signature _____

Designation _____

Date _____



**APPLICATION FORM FOR AUTHORIZATION OF DAILY INSPECTION
BY PILOT ON GENERAL AVIATION AIRCRAFT**

(To be filled by the applicant)

1. Mr / Miss / Mrs : _____
2. Holder of ALTP / SCPL / CPL NO. : _____
3. F. I Rating / Flying hours experience : _____

Note: Pilots holding F.I Rating or 600 flying hours experience on type aircraft is eligible for grant of D. I authorization.

4. Training on Aircraft type : _____ for period from _____ to _____

(To be filled by the testing authority)

5. Tested on aircraft type : _____ dated _____ by _____

Note: Pilots holding F.I rating / flying hours experience on certain type aircraft must be trained and tested on same type aircraft for which D. I authorization is applied for.

6. He / She was found to be competent / not competent to carry out daily inspection

Signature: _____

Name : _____

Designation : _____

Organization : _____

SPECIMEN FOR SCHEDULE OF WORK**POSITION HELD**

S/N	DESIGNATION	SECTION	LOCATION	FROM	TO

TRAINING OBTAINED (Including Seminars, workshops etc)

S/N	BASIC	DURATION	FROM	TO

S/N	TYPE	DURATION	FROM	TO

EXPERIENCE RECORD

1. NAME _____ 2. STAFF NO. _____ 3. DESIGNATION _____
4. SECTION & LOCATION _____ 5. SUB-SECTION/GROUP _____
6. LICENCE/APPROVAL HELD _____ 7. CATEGORY (a) LICENCE _____
- (b) APPROVAL _____

ATA CHAP	MAINTENANCE /OVERHAUL TASK	EQPT.	REGN SERIAL NO.	NATURE OF WORK	SIGNATURE &DATE	CERTIFYING AUTHORITY *

CERTIFIED THAT ABOVE
INFORMATIONS ARE CORRECT.

SECTIONAL HEAD STAMP QUALITY HEAD STAMP

SIGNATURE/DATE SIGNATURE

* The person in charge should certify each item when he is fully satisfied that the applicant has participated in or satisfactorily carried out the work / inspection. The person certifying this experience record will be equally held responsible, if any false information is given and will be liable to Part XVIII of the CAR 94.

UNDERTAKING

1. I, Mr. _____ Solemnly declare that the information provided and work carried out by me are correct.

If any information provided or work that has been carried out by me, is found to be false or misleading. I shall render myself liable to Part XVIII – Penal Provisions and Prosecutions of the Civil Aviation Rules 1994.

I have completely read and understood Part XVIII (Penal Provisions and Prosecutions) and Part XIX (with Holding, Suspension and Cancellation of Licenses and Certificates) of the Civil Aviation Rules 1994.

Applicant's Signature: _____

AME No. Approval No. / P. No. _____

Date : _____

MEDICAL CERTIFICATE FOR COLOUR VISION

I, Dr. _____ hereby certify that I
have examined Mr/Ms _____
whose signature is appended below, and certify that his colour vision is Normal/Defective
safe/Defective unsafe. (Strike off which is not applicable).

The colour vision has been tested with:

- (1) Pseudo-Isochromatic plates
- (2) Approved Lantern test.
- (3) Any other test applicable.
(Strike off which is not applicable).

Signature of the Applicant

Signature of Doctor

Designation: _____

Registration No. _____

Date: _____

CIVIL AVIATION AUTHORITY
AIRWORTHINESS DIRECTORATE
APPLICATION FOR ISSUE OF PROFICIENCY CERTIFICATE
CATEGORY _____

1. Name _____
2. Father's name _____
3. Date of birth _____ Nationality _____
4. NID NO. _____
5. Present address _____
5. Permanent address _____
6. Employer's Name _____
8. Particulars of employment together with maint./teaching experience at any Aviation organisation _____

Sr. No.	Cat./Sub-cat or type of A/C or equipment	Position held (statement of employer and place of employment)	Period		Experience confirmed by (Head of unit/Section)
			From	To	

9. Give particulars of P.C you wish to apply :
 - i) Cat./Sub-Cat. : _____
 - ii) Type of Aircraft/Engine/Equipment : _____

10. I Desire to be examined at: Karachi Islamabad Lahore
11. Did you apply for the above category of PC in the past. If so, give following details:

Sr. No.	Cat./Sub-cat or type rating of PC	Session / Year	Result	Remarks

12. Do you have a Medical Certificate confirming you to be free from physical and mental disability (attach the certificate).
13. I solemnly declare that the information provided by me is correct. If anything is found to be contrary, I shall render myself to be debarred from Proficiency Certificate examination for a period of three years.

Applicant's Sign: _____
P.No.: _____
PC. No.: _____
Date: _____

To be filled in by Examination unit.

For internal use only

1. Total Aviation experience: _____ Years. SAT./UNSAT.
2. Teaching experience: _____ Years. SAT./UNSAT
3. Practical maint. experience on rating applied for: _____ Years. SAT./UNSAT
4. Date of completion of Basic Course: From _____ To _____ T./UNSAT
5. Date of completion of Type Course: From _____ To _____ . /UNSAT
6. OJT on rating applied for: From _____ To _____ AT./UNSAT
(Attach OJT certificate)
7. No. of Basic Courses conducted under supervision: SAT./UNSAT
From _____ To _____
(a) _____
(b) _____
(c) _____
8. No. of type courses conducted under supervision : SAT./UNSAT
From _____ To _____
(a) _____
(b) _____
(c) _____
9. Has the applicant passed Basic written exam: Yes / No SAT./UNSAT.
10. Has the applicant passed Type written exam: Yes / No SAT./UNSAT.
11. Has the applicant attended instructional technique course (attach copy of certificate) Yes / No SAT./UNSAT.

Remarks

- i) May be accepted for Basic & Type
- ii) May be accepted for Type only
- iii) May be rejected due non-compliance with

- i) May be accepted for : _____
- i) May be accepted for : _____

Signature : _____
Name : _____
Designation : _____
Date : _____

Signature : _____
Name : _____
Designation : _____
Date: : _____

CIVIL AVIATION AUTHORITY
AIRWORTHINESS DIRECTORATE

APPLICATION FOR EXTENSION OF PROFICIENCY CERTIFICATE
CATEGORY _____

1. Name _____
2. Father's name _____
3. Date of birth _____ Nationality _____
4. NIC NO. _____
5. Present address _____
6. Permanent address _____
7. Employer's Name _____
8. Particulars of employment together with maint./teaching experience at any aviation organisation

Sr. No.	Cat./Sub-cat or type of A/C or equipment	Position held (statement of employer and place of employment)	Period		Experience confirmed by (Head of unit/Section)
			From	To	

9. Give particulars of P.C you wish to apply :
 - i) Cat./Sub-Cat. : _____
 - ii) Type of Aircraft/Engine/Equipment : _____
10. I Desire to be examined at : Karachi Islamabad Lahore
11. Did you apply for the above category of PC in the past. If so, give following details :

Sr. No.	Cat./Sub-Cat. And type rating of PC	Session/Year	Result	Remarks

12. Do you have a Medical Certificate confirming you to be free from physical and mental disability (attach the certificate).
13. I solemnly declare that the information provided by me is correct. If anything is found to be contrary, I shall render myself to be debarred from Proficiency Certificate examination for a period of three years.

Applicant's Sign: _____

P.No.: _____

PC. No.: _____

Date: _____

To be filled in by Examination unit.
only

For internal use

1. Total Aviation experience: _____ Years. SAT./UNSAT.
2. Teaching experience: _____ Years. SAT./UNSAT
3. Practical maint. experience on rating applied for: _____ Years. SAT./UNSAT
4. Date of completion of Basic Course: From____To_____ SAT./UNSAT
5. Date of completion of Type Course: From____To_____ SAT./UNSAT
6. OJT on rating applied for: From_____To_____ SAT./UNSAT
(Attach OJT certificate)
7. No. of Basic Courses conducted under supervision:
SAT./UNSAT
From To
(a) _____
(b) _____
(c) _____
8. No. of type courses conducted under supervision : SAT./UNSAT
From To
(a) _____
(b) _____
(c) _____
9. Has the applicant passed Basic written exam: Yes / No SAT./UNSAT.
10. Has the applicant passed Type written exam: Yes / No SAT./UNSAT.
13. Has the applicant attended instructional
technique course (attach copy of certificate) Yes / No SAT./ UNSAT.

Remarks

- i) May be accepted for Basic & Type
- ii) May be accepted for Type only
- iii) May be rejected due non-compliance with

- i) May be accepted for : _____
- i) May be accepted for : _____

Signature : _____
Name : _____
Designation : _____
Date : _____

Signature : _____
Name : _____
Designation : _____
Date: : _____

**POLICY REGARDING STANDARD OF WRITTEN
EXAMINATION**

Percentage of marks	Result	Remarks
70% and above.	Pass	***
55% to 69%	Fail	May re-apply in next session, subject to compliance with other applicable requirements.
45% to 54%	Fail	May re-apply, after attending Basic refresher course, subject to compliance with other applicable requirements.
Fail Below 45%	Fail	May re-apply, after successful completion of complete Basic course, subject to compliance with other applicable requirements.

TYPE PAPER

70% and above	Pass	***
55% to 69%	Fail	May re-apply, in next session subject to compliance with other applicable requirements.
45% to 54%	Fail	May re-apply, after gaining 6 months practical experience of maintenance /major checks & attending type refresher course, subject to compliance with other applicable requirements.
Below 45%	Fail	May re-apply, after gaining 6 months practical experience of Maintenance major checks and successful completion of complete type course, subject to compliance with other applicable requirements.

