Civil Aviation Authority of Sri Lanka

AVIATION SAFETY NOTICE

ASN No 008	Ref No: AWS/2006/04	File Ref: AW/20/2/2

Recipients		1. All Aircraft Maintenance Training Schools. 2. Approved Maintenance Organisations. 3. All Aircraft Maintenance Licence Holders. 4. Sri Lanka Air Force
01.Subject	:	**Administrative Procedures for the conduct of Aircraft Maintenance Engineer – Basic Licence (AME-BL) Examination.**
02.Nature	:	Mandatory
03.Issue no	:	02
04.Status	:	New
05. Effective date	:	With immediate effect
06. Validity	:	Until Further Notice
07.Contact person	:	Inquiries may be directed, preferably by letter to, Deputy Director (Airworthiness), Civil Aviation Authority, No.64, Galle Road, Colombo 03, Sri Lanka. Telephone: +94 11 2391305.
08.Availability	:	A copy of this document is available for reference at the technical library of Civil Aviation Authority. Copies can be collected at reproduction cost.
09.Applicability	:	Any person who seek information on administrative procedure to obtain an Aircraft Maintenance Engineer –Basic Licence
10. Comments	:	Comments (if any) on the Contents of this Aviation Safety Notice (ASN) may be forwarded to the contact person. However the Aviation Safety Notice will come into effect on the date shown therein notwithstanding any objection or comment made by any person or party unless and until an amendment to the Aviation Safety Notice is issued afresh by the Director General of Civil Aviation.
11.Notice	:	The procedures contained in this ASN will be applicable to the conduct of AME - BL examination.
12.Histroy of Revision	:	All previous correspondence issued to conduct AME-BL examination has been superseded by this ASN
13. Related ASNs	:	Nil

14.Action Required : Strict compliance of the contents in the attachment by the applicants for an Aircraft Maintenance Engineer – Basic Licence

15. Checklist : List of current ASN nos. are as follows

ASN No	Issue No	Date of Applicability	Remarks
ASN002	01	10.03.2000	nil
ASN003	01	18.08.2000	nil
ASN004	01	13.02.2001	nil
ASN005	01	26.03.2001	nil
ASN007	01	15.09.2001	nil
ASN008	02	20.09.2006	Replaced ASN 008 issue no 01
ASN009	01	18.02.2002	nil
ASN010	01	18.02.2002	nil
ASN011	01	18.02.2002	nil
ASN012	01	18.02.2002	nil
ASN013	01	08.02.2002	nil
ASN014	01	01.03.2002	nil
ASN015	01	01.03.2002	nil
ASN016	01	01.03.2002	nil
ASN017	02	10.03.2005	Replaced ASN 017 issue no 01
ASN018	01	20.03.2002	nil
ASN019	01	01.04.2002	nil
ASN021	01	01.04.2002	nil
ASN022	01	08.04.2002	nil
ASN023	01	01.06.2002	Replaced ASN003
ASN024	01	02.09.2002	nil
ASN025	02	15.10.2002	Replaced ASN001
ASN026	01	15.10.2002	nil
ASN027	01	12.12.2002	nil
ASN028	01	12.03.2003	nil
ASN029	01	21.03.2002	nil
ASN030	01	10.07.2002	nil
ASN031	01	15.072003	Replaced ASN 006
ASN032	01	25.07.2003	nil
ASN033	02	25.08.2005	Replaced ASN 033 issue no 01
ASN034	01	11.09.2003	nil
ASN035	01	12.09.2003	nil
ASN036	01	12.09.2003	nil
ASN037	01	13.10.2003	nil
ASN038	01	07.06.2004	nil
ASN039	02	03.04.2006	Replaced ASN 039 issue no 01
ASN040	01	07.07.2004	nil
ASN041	01	16.07.2004	nil
ASN042	02	21.12.2005	Replaced ASN050 and ASN 042 issue no 01
ASN043	02	12.08.2004	Amendment to ASN no 013
ASN044	02	13.03.2006	Replaced ASN 044 issue no 01
ASN045	01	10.09.2004	nil
ASN046	01	14.09.2006	nil
ASN047	02	30.01.2006	Replaced ASN 047 issue no 01
ASN048	01	17.09.2004	nil
ASN049	01	20.09.2004	nil
ASN051	01	20.09.2004	nil
ASN052	01	20.09.2004	nil
ASN053	02	11.11.2004	nil
ASN054	01	01.04.2005	nil
ASN055	01	01.04.2005	nil
ASN056	01	01.12.2005	nil
ASN057	01	01.12.2005	nil
ASN058	01	01.12.2005	nil

ASN059	-	-	Not yet issued
ASN060	02	05.08.2005	Replaced ASN 060 issue no 01
ASN061	02	05.08.2005	Replaced ASN 061 issue no 01
ASN062	01	01.04.2005	nil
ASN063	01	20.12.2004	nil
ASN065	01	06.04.2005	nil
ASN066	01	16.05.2005	nil
ASN067	01	16.05.2005	nil
ASN068	01	18.05.2005	nil
ASN069	01	18.05.2005	nil
ASN070	01	18.05.2005	nil
ASN071	01	18.05.2005	nil
ASN072	01	18.05.2005	nil
ASN073	01	19.05.2005	nil
ASN074	01	19.05.2005	nil
ASN075	01	19.05.2005	nil
ASN076	01	16.06.2005	nil
ASN077	01	08.08..2005	nil
ASN078	01	21.12.2005	nil
ASN079	01	16.09.2005	nil
ASN080	01	07.11.2005	nil
ASN081	02	25.06.2006	Replaced ASN 081 issue No. 01
ASN082	01	23.11.2005	nil
ASN083	01	01.12.2005	nil
ASN084	01	16.12.2005	nil
ASN085	01	05.01.2006	nil
ASN086	01	06.04.2006	nil
ASN087	01	06.04.2006	nil
ASN088	01	06.04.2006	nil
ASN089	01	10.05.2006	nil
ASN090	01	03.06.2006	nil
ASN091	01	15.06.2006	nil
ASN094	01	02.06.2006	nil

H M C Nimalsiri,
Director General of Civil Aviation and
Chief Executive Officer

Civil Aviation Authority of Sri Lanka,
No. 64, Supreme Building,
Galle Road, Colombo 03.
Telephone: 94 11 2433213, Fax: 94 11 2440231
E-mail: caasl@sri.lanka.net

ADMINISTRATIVE PROCEDURES FOR THE CONDUCT OF AIRCRAFT MAINTENANCE ENGINEER – BASIC LICENCE EXAMINATION (AME - BL)

General

This Aviation Safety Notice (ASN) sets out the requirements standards and procedures for obtaining an Aircraft Maintenance Engineer (AME) license pursuant to section 22(1) of the Sri Lanka Air Navigation Regulations of 1955.

01. Scope

(i) This Aviation Safety Notice prescribes the requirements for the issue, renewal and endorsement on an Aircraft Maintenance Engineer – Basic License (AME - BL).

(ii) For the purpose of these standards the following definitions apply:

(a) "avionics system" – means aircraft electrical, electronic, instrument and radio radar systems.

(b) "Acceptable basic training course" – means a course that meets the basic training requirement but does not give an applicant any experience credit towards an AME-BL.

The basic criteria require a course of 1000 hours covering the full range of theory applicable to the category of license requested. For example, an applicant for a license in Category A and C must have had training in both airframes and engines. Candidates must demonstrate, not only that they have attended the course, but that they have completed it successfully. An example of an acceptable basic training course would be an aircraft mechanics course taken by correspondence which is self paced to meet the examination syllabus described in Appendix D to this ASN, and takes approximately 1,000 hours to complete in a period not less than a year. Experience requirement is appearing on Appendix B

(c) "Approved basic training course" – means course that has been approved by the Director General of Civil Aviation. In addition to meeting the basic training requirement an approved course also entitles the applicant to an experience credit of one month for every 100 hours of the approved course, to a maximum of 12 months. An example would be an approved training course with a curriculum of 1800 hours, giving the candidate on successful completion of training an experience credit of 12 months towards the total experience requirement. Experience requirement is appearing on Appendix B

(d) "Group" – means a number of types of aeronautical products, which have similar technical characteristics.

(e) "Limitation" – means an endorsement on an AME license which restricts the scope of privileges conferred by the license.

(f) "Propulsion systems" – means aircraft engines, propellers and dynamic components.

(g) "Rating" – means an endorsement on an AME license, indicating the types of aircraft or other aeronautical products to which the license privileges apply.

(h) "Aircraft maintenance activities" – any or all of the technical aspects of maintenance, including base maintenance of aircraft, line maintenance of aircraft, aircraft component workshop activities, production planning, engineering services, quality assurance, and technical training.

02. Requirement to Hold a License

Only an individual with a valid and appropriately rated AME License, authorized by an Approved Maintenance Organisation, can sign a maintenance release for any maintenance performed on aeronautical products and may exercise other privileges as specified in this ASN.

03. Issue, Renewal and Endorsement of a License

The scope of privileges of an AME license is indicated by ratings endorsed on the license. Ratings are divided into categories, according to the groups of aeronautical products.

04. Types of Licenses, Categories and Certification Privileges

Types of Licenses

(i) Basic License

(ii) Type Rated License

(i) Basic Licenses.

(1) License Categories

Categories		Scope
Category **(A)** – Airframe	-	Maintenance of airframe and associated aircraft systems on pressurized or unpressurized aircraft as applicable.
Category **(C)** - Engines	-	Maintenance of Turbine or piston powered engines and associated systems as applicable.
Category **(X)** – Electrical	-	Maintenance of on wing and off wing Aircraft AC and DC systems.
Category **(X)** – Instrument	-	Maintenance of on wing and off wing Aircraft Instrument systems, Auto Pilot Systems, Initial Navigation System.
Category **(X)** – Radio/Radar	-	Maintenance of on wing and off wing Communication and Radio Radar systems.

Note 1 : Examinations for the Categories A, C, X(Electrical), X(Instrument), X(Radio) – will be discontinued with the implementation of AML examination system extending the provisions to convert AME-BL to AML.

Certification Privileges of Type License
Eligible to issue Certificates of Release to Service following any maintenance within the scope of the type endorsement and limited by the manufacturer's maintenance manuals, subject to holding a certification Approval by an Approved Maintenance Organization.

Information Note:
The scope of an AME license is limited by the work described in the manufacturer's Maintenance and Structural Repair Manuals. Any maintenance described in the Component or Engine Overhaul Manuals is not within the scope of an AME License and must be accomplished by individuals authorized by an appropriately rated Approved Maintenance Organization (AMO), for such work.

(1) Applications for an AME-BL License are to be completed as follows:

(a) Applications for an AME License shall be submitted on Form ACC/PL/028, which is available upon request from the Personnel Licensing Section of the CAA. All copies of the Form shall be submitted to the Personnel Licensing Section of the CAA. The AME logbook or Work Sheets, Certificates and other records relating to training and experience, shall be attached.

(b) All supporting documents shall be original and a set of photocopies of the originals should also be attached to the application. They shall not be in abbreviated or coded form. Supporting documents shall be in Sinhala, Tamil or English. Authentic translation in English for other languages shall be the applicant's responsibility.

(c) Following a review of the application and supporting documents, the application shall be accepted or rejected by the staff of Personnel Licensing Section of the CAA. Original documents shall be returned. In the event of the application is accepted the applicant shall be advised of which examinations must be successfully completed for the grant of license / endorsements requested with the details of the examination.

(2) Requirements for issuance:

Applicants must provide proof of citizenship, age, training, knowledge, experience and skill level requirements as described below.

(a) **Citizenship**

Any of the following documents shall be acceptable:

(i) a birth certificate issued in Sri Lanka;

(ii) a valid passport from any state;

(iii) a citizenship certificate of any state;

(iv) a valid aviation personnel license showing the citizenship of the holder and issued by the state of which he/she is a citizen;

(v) National Identity Card

(b) **Age**

The applicant shall be of 21 years in age before issue of the license.
Proof of age shall be shown by means of :

(i) a birth certificate;

(ii) a passport from any state;

(c) **Educational Qualification**

An applicant for the Basic License shall have obtained the following basic educational qualifications or equivalent:

1. Credit Pass in English at GCE (O/L) or simple passes in high level English examination.

   And

2. Pass in six subjects at GCE (O/L) inclusive Science and Mathematics with at least credit pass either in Mathematics or Science in not more than two attempts.

   Or

Pass at GCE (A/L) in two Physical Science stream subjects

(d) **Training Requirements**

An applicant shall meet the following requirements in addition to the training needs given in the Appendix B.

Basic Training

Where the table of requirements at appendix B indicates a need for basic training, Applicant, for initial AME-BL license, or for additional ratings in a new license category shall have satisfactory completed an approved or acceptable course of training in basic aircraft maintenance as appropriate.

An applicant who holds an academic degree in a technical discipline of a recognized University or a qualification equivalent to a University degree or a technical qualification of a Higher Educational Institute acceptable to the DGCA will be given credit, for the subjects covered during the academic course of study.

However, any subjects required to be covered for Basic Courses as stated in Appendix B of this ASN, but not covered during the course of study will have to be completed prior to an application for an AME-BL license by a Degree Holder or any other technical certificate holder.

Information Note:

For the purpose of this standard, the definitions of an “acceptable basic training course” and an “approved basic training course” that meet the basic training standards are stated in Section 01 of this ASN. Further information regarding these courses are contained in Appendix C of this ASN.

(c) **Knowledge**

Applicants shall successfully complete all examinations specified in the applicable table of requirements contained in Appendix B of this ASN. In the case of applications for validations and new licenses based on a license from a contracting state credit shall be given for the examinations passed in respect of the ratings already held or exceptions as applicable.

(d) **Examination Format**

Examination for each category shall consist of the following:

- One Multiple Choice question paper on the requested Category
- One essay type question paper on the requested Category.
- One Multiple Choice question paper on Air Low of Sri Lanka where applicable
- Air force personnel recommended by the commander of the Air Force or the Director of Aeronautical Engineering who successfully complete all other requirements are eligible to sit for the AME-BL examination. To issue a Basic License he will have to successfully complete a Multiple Choice Paper on Civil Aircraft maintenance Organizations, Maintenance Procedures and Practices. The syllabus for this examination is given in Appendix E to this ASN.

  Examinations will be held twice a year. The dates of the Examination will be notified to the industry through by a notification through CAASL web site.

  Note: The Syllabus for the examinations in Categories A, C, X1, X2, X3 is given in the Appendix D to this ASN.

(e) **Experience**

(i) Applicants for a basic license shall have acquired the amount and type of maintenance experience specified in the table of requirements contained in Appendix B of this ASN.

(ii) Serving member of the Sri Lanka Air Force with a minimum of ten years service who meet all the other requirements and who are recommended by the Commander of the Air Force or the Director Aeronautical Engineering of the Air Force will be allowed for the Basic License Examination. This such applicant who completed the written examination successfully should prove six month civil aircraft maintenance experience to qualify him for the requested examination on 'Civil Aircraft Maintenance Organisation, Maintenance Procedures and Practices' to grant him the AME-BL

(iii) For any category, at least last six months practical work experience (worksheets) should be submitted.

(iv) Experience can be gained either on a full-time or part time basis.

(v) Applicants who claim part time experience shall produce original records, substantiating the actual hours worked.

(vi) When assessing experience claims, 1 year shall consist of 1800 working hours. No credit shall be allowed for more than 150 hours experience in any one month.

(vii) Where the table of requirements specifies a need for experience in a particular category and the applicant has been simultaneously employed in a number of different categories, the time claimed shall be apportioned between the groups.

(viii) Where an applicant claims time as solely devoted to a specific category that time period shall not be subsequently credited toward any other category.

(ix) An applicant who holds an academic degree in a technical discipline which recognized by the Institute of Engineers of Sri Lanka as equivalent to a University degree or a technical qualification of a Higher Educational Institute acceptable to meet the basic training criteria in these standards will be given a maximum credit of two years towards the experience requirement given in appendix B.

(f) **Skill – Maintenance Tasks**

(i) Applicants for initial issue of a license, or for additional ratings in a new category, shall provide proof of having performed a representative selection of maintenance tasks over the full range of applicable systems or structures. A minimum of 70% of the applicable tasks for the relevant category is considered an acceptable sample. Appendix A gives the breakdown of tasks by ATA chapters.

(ii) The tasks shall be carried out at least once under the direct supervision of an appropriately rated AME, who has superior knowledge over the applicant on the task being performed.

(iii) The supervising AME or other individual acceptable to the DGCA shall certify the completion of each task together with :

(a) the date; and

(b) the aircraft type, registration mark, or component part number, as applicable

(iv) Certification shall indicate that, in relation to the task, the applicant is competent to:

(a) identify the correct standard for the performance of the task;

(b) select the proper tools;

(c) perform the task correctly without supervision; and

(d) complete the necessary documentation

B. Type Rated License

Applicants for a type license shall hold a valid basic license in the relevant category and meet the training / knowledge and the experience requirements, for the requested Type Rating**.**

(a) Basic License

The applicant for a type rated license shall have a basic license issued by the DGCA in the appropriate category.

Example:

An applicant for a Boeing 747 Airframe or engine Type Rated License shall have a basic license in the category A & C issued by the DGCA.

(b) Training or Knowledge Requirements

a. Successfully completed a Type Course at a recognized Training School, acceptable to the DGCA, on the Type of Aircraft for which full approval is required. In the absence of a Type Course acceptable to the DGCA the applicant will be required to complete an examination held by the DGCA. The above is only applicable to light aircraft of less than 5,700 Kg MTOW. The examination may take the form of a written or oral test, at the discretion of the DGCA.

Note: The DGCA will determine the scope and content of the examination. If the application for a Type Rating is requested for a new aircraft type brought into the country the applicant will be required to bear the administrative costs with regard to holding the examinations.

(ii) Experience

Pressurized, Turbine powered or Aircraft over 5,700Kg. MTOW or Turbine powered Helicopters and Helicopters with MTOW of over 3175 Kg.

The applicant must show continuous work experience on the group of aircraft for which the endorsement is sought for a period of not less than one year, after obtaining the basic license and proof of work experience on the Type Aircraft for which the endorsement is sought for a continuous period of not less than six months after the satisfactory completion of the Type Course.

Unpressurised, Piston Powered Aircraft with a MTOW of under 5,700 Kg. or Piston powered Helicopters with a MTOW of less than 3175 Kg.

The applicant must show continuous work experience on the group of aircraft for which the endorsement is sought, for a period of not less than one year, after obtaining the basic license. The applicant should also show experience on the type of aircraft for which the endorsement is sought for a continuous period of not less than four months after the satisfactory completion of the Type Course. Experience can be gained either on a fulltime or part time basis.

Applicants who claim part time experience shall produce original records, substantiating the actual hours worked.

When assessing experience claims, one year shall consist of 1800 working hours.

Where the table of requirements specifies a need for experience in a particular group and the applicant has been simultaneously employed in a number of different groups, the time claimed shall be apportioned between the groups.

On complying with above criteria the DGCA would endorse the License stating eligibility to hold full approval.

(iii) AME Personnel Log

The record of tasks completed, and details of the applicant's training and experience, may be recorded in an AME Log Book. The supervising AME or other individual acceptable to the DGCA who signs the employment and training sections of the accuracy of statements in the book regarding tasks completed in their employment. As an alternative to AME personnel logs, the applicant would allow to maintain worksheets.

05. Validation of Foreign Licenses

1. Issue of a foreign validation certificate

(a) A foreign license validation certificate shall be issued to an applicant who provides the following and when the DGCA is satisfied the conditions for the issue of a license validation:

(i) a foreign license valid under the laws of a Contracting State and valid for the privileges requested.

(ii) and a letter requesting issue of the Foreign License Validation Certificate and specifying the purpose for which the foreign license is to be validated.

The Foreign License Validation Certificate shall normally be issued for a period of six months from the date of issue and shall clearly indicate that its validity will be dependent on the validity of the Foreign License. A shorter period may be granted.

2. Conditions for the issue of a foreign license validation

(i) The DGCA is satisfied that the foreign license meets or exceeds the standards for the issue of a similar license of the Civil Aviation Authority of Sri Lanka

(ii) The foreign license should be appropriately endorsed and currently valid.

(iii) The applicant should satisfactorily complete an examination on Air Navigation Regulations conducted by the DGCA.

(iv) Foreign license validations will be issued only when the assignment is of a temporary nature.

(v) The foreign license validation will be issued on the receipt of confirmation from the issuing Authority about the validity of the license.

Note : The onus of providing any information required by the DGCA for such validation lies with the applicant.

06. Issuance of Aircraft Maintenance License Based on a Foreign License

1. An AME license shall be issued to an applicant who provides the followings and the DGCA is satisfied that the applicant satisfies the conditions for the issue of a license;

(i) Foreign license valid under the laws of the contracting state and valid for the privileges requested; and

(ii) A letter requesting the issue of a license based on the foreign license from the operator who requires the service.

2. Conditions for the issue of a license based on a foreign license

(i) The foreign license should be appropriately endorsed and currently valid.

(ii) The applicant must show that the conditions of issue of the foreign license meets or exceeds the conditions of issue of a similar license under these standards.

(iii) The issuing Authority of the foreign license should confirm validity of the license.

(iv) The applicant should satisfactorily complete an examination on Air Navigation Regulations conducted by the DGCA.

Note : The onus of providing any information required by the DGCA for such issuance lies with the applicant.

07. Validity Period of License

(1) The AME license contains an expiry date which is one year from the date of issue.

Information Note :
The date of issue and the date of expiry appear on the license.

(2) Renewal

(a) To qualify for renewal, the holder of the license shall show compliance with the recency of experience requirements of Section 07 of this ASN.

(i) Application for renewal can be made by submission of a completed AME License Application Form CAA/PL/028 to the DGCA during the 60 days immediately preceding the expiry date but not less than 30 days prior to the expiry date printed on the license.

(ii) The license can also be renewed at the time of endorsement for additional ratings, Categories or change of address.

(iii) Details of the training and experience gained since the last application shall be entered in the appropriate section of the form.

(iv) The form shall be signed and dated by the applicant and forwarded to the Personnel Licencing Section of the CAA with the applicable fee.

(b) An AME who satisfies all other conditions for renewal but whose License has expired.

(i) For less than 1 month, the license will be renewed on submission of a valid explanation.

(ii) For more than 1 month but less than 6 months, the license will be renewed with effect from the date of submission of application for renewal, on submission of a valid explanation.

(iii) For more than 6 months but less than 2 years, shall be renewed with effect from the date of submission upon meeting the requirements for renewal, including a letter, AME log book/worksheets entries, aircraft technical records or other documentation signed by their supervisor indicating that they have met the recency requirements in accordance with the standards given in this ASN.

(iv) For more than 2 years but less than 5 years, shall be issued with a new licence upon meeting the requirements for renewal, including a letter, AME log book/ worksheet entries, aircraft technical records or other documentation signed by their supervisor indicating that they have met the recency requirements in accordance with the standards given in this ASN and successfully completion of Air Legislation written examination and Oral conducted on the subject by the DGCA.

(iv) For more than 5 years, shall be issued with a new license upon meeting all the requirements for initial issue.

Information Note:

With respect to (iii) above, the extent of the assessment will be dependent on the nature of the AME's employment since the license was last renewed and on the degree to which such employment can be considered by the DGCA as meeting the requirements for initial issue.

(c) License issued in accordance with 2 (b) (ii), (iii), (iv) and (v) of this section shall be valid from the date upon which all the requirements are met (i. e. they will not be back – dated).

08. Recency Requirements

In order to be eligible for renewal of an AME license the applicant must have six months of maintenance experience on civil aircraft since the issue / last renewal of the license, in addition to;

(1) An Aircraft Maintenance Engineer (AME) who meets all conditions required to exercise the privileges of the license, shall not do so unless,

(a) The license was issued within the preceding 12 months; or

(b) The holder of the license has, for at least six months within the preceding 12 months,

(i) Performed aircraft maintenance,

(ii) supervised the performance of aircraft maintenance,

(iii) Supervised in an executive capacity the performance of aircraft maintenance, or

(iv) Served as an aviation maintenance instructor or supervised another aviation maintenance instructor in an aircraft maintenance training course provided by an approved training organization.

(2) The holder of an AME license who is not in compliance with subsection (1) shall regain currency in accordance with the standards set out in this ASN.

(3) An AME who does not meet the recency requirements of these standards shall regain compliance by :

(a) Working under supervision for a minimum period of six months; or

(b) Successfully completing an examination on the Sri Lanka Air Navigation Regulations.

(4) Where an AME choose to meet the recency of experience requirement by (3) (b) above, and subsequently fails, the privileges of the license can no longer be exercised until the Sri Lanka Air Navigation Regulation examination is successfully completed.

Information Note :

(i) With regard to the supervision of aircraft maintenance, "executive capacity" includes managerial, regulatory or administrative responsibility for the technical aspects of aviation maintenance, but does not include non-technical executive responsibilities.

(ii) With regard to aviation maintenance instruction, supervision includes responsibility for course technical content and standards, but does not include academic, administrative or financial responsibilities.

(iii) With respect to recency requirements, Air Navigation Regulations 24 describes the conditions, which the DGCA may adopt in renewal of licenses.

09. Fees Chargeable for the Aircraft Maintenance Engineers Basic Examination

The fees chargeable in respect of issue/renewal of Aircraft Maintenance Engineers Basic Licence examination should follow the Gazetted charging system currently in place.

Appendix A

Example of Suitable Tasks

ATA : 05 (Time limits / Maintenance Checks)
100 hours check (small aircraft)
"B" and "C" check (transport category)
Review records for compliance with ADs
Inspection following heavy landing
Inspection following lightning stoke

ATA : 06 (Dimensions / Areas)
Locate component(s) by station number
Perform symmetry check

ATA : 07 (Lifting and Shoring)
Jack aircraft nose or tail wheel
Jack complete aircraft

ATA : 08 (Leveling / Weighting)
Level aircraft
Weight aircraft
Prepare weight and balance amendment
Check aircraft against equipment list

ATA : 09 (Towing and Taxing)

Tow aircraft
Taxi aircraft

ATA : 10 (Parking and Mooring)
Tie down aircraft
Park, secure and cover aircraft
Position aircraft in dock
Secure rotor blades

ATA : 11 (Placards and Marking)
Check aircraft for correct placards
Check aircraft for correct makings

ATA : 12 (Servicing)
Refuel aircraft
Defuel Aircraft
Check tyre pressure
Check oil pressure
Check oil level
Check hydraulic fluid level
Check accumulator pressure
Charge pneumatic system
Grease aircraft
Connect ground power
Service toilet / water system
Perform pre-flight check

ATA : 18 (Vibration / Noise Analysis)
Analysis helicopter vibration
Analysis noise spectrum

ATA : 21 (Air Conditioning)
Replenish freon system
Replace combustion heater
Replace outflow valve
Replace vapor cycle unit
Replace air cycle unit
Replace cabin blower
Replace heat exchanger
Replace pressurization controller
Clean outflow valves
Check air conditioning / heating system
Check Pressurization system
Troubleshoot faulty system

ATA : 22 (Auto Flight)
Install servos
Rig bridle cables
Replace controller
Replace amplifier
Check operation of auto – pilot
Check operation of auto – throttle
Check operation of yaw damper
Check and adjust servo clutch
Perform autopilot gain adjustments
Perform mach trim functional check
Troubleshoot faulty system

ATA : 23 (Communication)
Replace VHF com unit
Replace HF com unit
Replace existing antenna
Install new antenna
Replace static discharge wicks
Check operation of radios
Perform antenna VSWR check
Perform SELCAL operational check
Perform operational check of PA system
Check audio integrating system
Repair coaxial cable
Troubleshoot faulty system

ATA : 24 (Electrical Power)
Charge lead / acid battery
Charge ni-cad battery
Replace generator
Replace switches
Replace circuit breakers
Adjust voltage regulator
Amend electrical load analysis report
Repair / replace electrical feeder cable
Troubleshoot faulty system

ATA : 25 (Equipment / Furnishings)
Replace carpets
Replace crew seats
Replace passenger seats
Check inertia reels
Check seats / belts for security
Check emergency equipment
Check ELT for compliance with regulations
Repair toilet waste container
Repair upholstery
Change cabin configuration

ATA : 26 (Fire Protection)
Check fire bottle contents
Check operation of warning system
Check cabin fire extinguisher contents
Check lavatory smoke detector system
Install new fire bottle squib
Troubleshoot faulty system

ATA : 27 (Flight Controls)
Replace horizontal stabilizer
Replace elevator
Replace aileron
Replace rudder
Replace trim tabs

Install control cable and fittings
Replace flaps
Replace powered flying control unit
Replace flap actuator
Adjust trim tab
Adjust control cable tension
Check range and sense of movement
Check assembly and locking
Troubleshoot faulty system

ATA : 28 (Fuel)
Replace booster pump
Replace fuel selector
Replace fuel tank cells
Check filters
Flow check system
Calibrate fuel quantity gauges
Check operation feed / selector
Troubleshoot faulty system

ATA : 29 (Hydraulics)
Replace engine driven pump
Replace standby pump
Replace accumulator
Check operation of shut off valve
Check filters
Check indicating systems
Perform functional checks
Troubleshoot faulty system
ATA : 30 (Ice and Rain Protection)
Replace fluid tank
Replace pump
Replace timber
Replace distributor
Install wiper motor
Repair de-icing boot
Adjust brush block
Check operation of system
Troubleshoot faulty system

ATA : 31 (Indicating / Recording Systems)
Replace flight data recorder
Replace cockpit voice recorder
Replace clock
Replace panel vibrator
Replace master caution unit
Perform FDR calibration
Perform FDR data retrieval
Troubleshoot faulty system

ATA : 32 (Landing Gear)
Build up wheel
Replace main wheel
Replace nose wheel
Replace shimmy damper
Rig nose wheel steering
Replace shock strut seals
Replace brake unit
Replace brake control valve
Bleed brakes
Test antiskid unit
Test gear retraction
Change bungees
Install floats
Install skis
Adjust micro switches
Charge struts
Troubleshoot faulty system

ATA : 33 (Lights)
Repair / replace rotating bacon
Repair / replace landing lights
Repair / replace navigation lights
Repair / replace interior lights
Repair / replace emergency lighting
Check emergency lighting system
Troubleshoot faulty system

ATA : 34 (Navigation)
Calibrate compass
Replace airspeed indicator
Replace altimeter
Replace air data computer
Replace VOR unit
Replace ADI
Replace HSI
Check pitot static system for leaks
Check operation of directional gyro
Functional check weather radar
Functional check doppler
Functional check TCAS
Functional check DME
Functional check ATC transponder
Functional check flight director system
Functional check inertial navigation system
Check calibration of ADF system
Update flight management system
Check calibration of altimeter system
Troubleshoot faulty system

ATA : 35 (Oxygen)
Inspect on board oxygen equipment
Purge and recharge oxygen system
Replace regulator
Replace oxygen generator
Test crew oxygen system
Check oxygen mask development
Troubleshoot faulty system

ATA : 36 (Pneumatic Systems)

Replace filter
Replace compressor
Recharge desiccator
Adjust regulator
Check for leaks
Troubleshoot faulty system

ATA : 37 (Vacuum Systems)
Replace vacuum pump
Check / replace filter
Adjust regulator
Troubleshoot faulty system

ATA : 38 (Water / Waste)
Replace water pump
Replace faucet
Replace toilet pump
Troubleshoot faulty system

ATA : 45 (Central Maintenance System)
Retrieve data from CMU
Replace CMU
Perform BITE system

ATA : 49 (Airborne Auxiliary Power)
Install APU
Inspect Hot section
Troubleshoot

ATA : 63 (Rotor Drive)
Replace mast
Replace drive coupling
Replace clutch/freewheel unit
Replace drive belt
Install main gearbox
Check gearbox chip detector

ATA : 64 (Tail Rotor)
Install rotor assembly
Replace blades
Troubleshoot

ATA : 65 (Tail Rotor Drive)
Replace bevel gearbox
Replace universal joints
Overhaul bevel gearbox
Install drive assembly
Check chip detectors

ATA : 67 (Rotorcraft Flight Controls)
Install swash plate
Install mixing box
Adjust pitch links
Rig anti-torque system
Check operation and sense
Troubleshoot faulty system

ATA : 71 (Power Plant)
Build up ECU (quick engine change)
Replace engine
Replace scat hose
Repair cooling baffles
Repair cowling
Adjust cowl flaps
Repair faulty wiring
Troubleshoot

ATA : 72 (Piston Engine)
Remove / install reduction gear
Overhaul engine
Top overhaul
Check crankshaft run-out
Check tappet clearance
Check compression
Extract broken stud
Install helicoil
Perform ground run
Establish / check reference RPM
Troubleshoot

ATA : 72 (Turbine Engine)
Replace module
Hot section Inspection
Engine ground run
Establish reference power
Trend monitoring / gas path analysis
Troubleshoot

ATA : 73 (Fuel and Control, Piston)
Replace engine driven pump
Adjust automatic mixture control
Adjust automatic boost control
Install carburetor / injector
Adjust carburetor / injector
Clean injector nozzles
Replace prime line
Check carburetor float setting
Troubleshoot faulty system

ATA : 74 (Ignition System , Piston)
Change magneto
Change ignition vibrator
Change plugs
Test plugs
Check H. T. leads
Install new leads
Check timing
Check system bonding
Troubleshoot faulty system

ATA : 74 (Ignition System , Turbine)
Check glow plugs / ignitors
Check H. T. leads
Check ignition unit
Replace ignition unit
Troubleshoot faulty system

ATA : 76 (Engine Control)
Rig thrust lever
Rig RPM control
Rig mixture HP cock lever
Rig power lever
Check control sync
Check assembly and locking
Check range and sense
Adjust pedestal micro-switches
Troubleshoot faulty system

ATA : 77 (Engine Indicating)
Replace engine instrument(s)
Replace oil temperature bulb
Replace thermocouples
Check calibration
Troubleshoot faulty system.
ATA : 78 (Exhaust , Piston)
Replace exhaust gasket
Replace welded repair
Pressure check cabin heater
Troubleshoot faulty system

ATA : 78 (Exhaust , Turbine)
Change jet pipe
Change shroud assembly
Install trimmers

ATA : 79 (Oil)
Change Oil
Check filter(s)
Adjust pressure relief valve
Replace oil tank
Replace oil pump
Replace oil cooler
Replace firewall shut off valve
Perform oil dilution
Troubleshoot faulty system

ATA : 80 (Starting)
Replace starter
Replace start relay
Replace start control valve
Check cranking speed
Troubleshoot faulty system

ATA : 81 (Turbines, Piston Engines)
Replace PRT
Replace turbo-blower
Replace heat shields
Replace waste gate
Adjust density controller
ATA : 82 (Engine Water Injector)
Replace water / methanol pump
Flow check water / methanol system
Adjust water / methanol control unit
Check fluid for quality
Troubleshoot faulty system

ATA : 83 (Accessory Gear Box)
Replace gearbox
Replace drive shaft
Check chip detector

Appendix B

REQUIREMENT FOR ISSUE OF BASIC LICENSES

CATEGORY		**A-(Pressurized)**	**C-Jet Turbine**	**A-Un-pressurized**	**C-Piston**	**X-Electrical**	**X-Instrument**	**X-Radio**
Aircraft Classification		**Airframe**	**Engine**	**Airframe**	**Engine**	**Avionics**	**Avionics**	**Avionics**
Training	**Basic Aircraft Course**	**X**	**X**	**X**	**X**			

	Basic Avionics course					**X**	**X**	**X**
Experience	**Total Aircraft Maint, in Months**	**48**	**48**	**48**	**48**	**48**	**48**	**48**
	Aircraft Type in months	**06**	**06**	**06**	**06**	**06**	**06**	**06**
Examinations	**Aviation Regulations**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
	Standard Practices	**X**	**X**	**X**	**X**	**X**	**X**	**X**
	Fixed wing airframe	**X**		**X**				
	Piston Engines				**X**			
	Turbine Engines		**X**					
	Electrical system					**X**		
	Instruments Auto flight system						**X**	
	Radio Radar system							**X**

INFORMATION NOTE

CATEGORY	BASIC LICENSE IN CATEGORY	MAINTENANCE EXPERIENCE ON TYPE AIRCRAFT IN MONTHS	TYPE COURSE	MAINTENANCE EXPERIENCE AFTER TYPE COURSE IN MONTHS
A	X	06	X	06
C	X	06	X	06

E	X	06	X	06
I	X	06	X	06
R	X	06	X	06

Appendix C

Basic Training Course for Aircraft Maintenance Engineers

(1) Acceptable Basic Training Courses

(a) The requirements for a license in Category A and C include the completion of an acceptable course in aircraft maintenance. The requirements for issue of an AME-BL license in Categories E, I, R'(Avionics) include the completion of an acceptable course in avionics maintenance or electronic theory.

(b) These courses do not require the prior approval of DGCA and each application will be assessed against the training requirements at the time of submission. Candidates are advised to submit full details of the course at the time of their application.

(c) The basic criteria require a course of 1000 hours covering the full range of theory applicable to the category of license requested. For example, an applicant for a license in Category A and C must have had training in both airframes and engines. Candidates must demonstrate, not only that they have attend the course, but that they have completed it successfully.

(2) Approved Basic Training Courses

(a) DGCA has also approved certain training courses, which reduce the experience requirement for an AME-BL license.

(b) The courses as stated in (a), in addition to being acceptable as meeting the applicable basic training requirement (minimum 1800 – hour curriculum), may also entitle a successful graduate to a credit towards the total experience required for the issue of an AME license, by the amount indicated. This credit is applicable only to the total experience requirement and not to any category, type, or product experience requirements.

(c) Any institution wishing to provide more than the required 1800 hours may apply for an increased experience accreditation. The accreditation granted for an 1800 – hour course equals 18 months of experience. Should a program be increased by an additional 100 hours of training, the accredited time towards an AME-BL license would be one month. Where justified, accreditation can be increased to a maximum of 12 months.

Appendix D

AIRCRAFT MAINTENANCE ENGINEERS – BASIC LICENCE EXAMINATION SYLLABUS

SYLLABUS OF EXAMINATION FOR CATEGORY "X" – ELECTRICAL

General

A general knowledge of Sri Lanka Air Navigation Regulations pertaining to Airworthiness of Aircraft and duties of a licensed Engineer.

1. Direct Current Power

1.1 A general knowledge of the practical mathematics, involving vulgar and decimal fractions, percentages, measurements, logarithms, power of numbers, elementary trigonometry, graphs, transposition of formulas and solution of simple equations; general knowledge of the SI system and methods of conversion.

1.2 A detailed knowledge of the interpretation of engineering drawings, including symbols and projections; revision procedures for drawings and manuals; control of maintenance documentation. A general understanding of the specifications for technical data (Eg. ATA 100 Specifications)

1.3 A detailed knowledge of the inspection of screwed part for defects, damage, and locking; the types of screw threads used.

1.4 A detailed knowledge of the inspection of, and common defects associated with, locking devices, and hard and soft soldering.

1.5 A general knowledge of the practices and necessary precautions associated with general hand tools simple machine tools and precision measuring equipment.

1.6 A general knowledge of the fire and safety precautions to be observed during aircraft maintenance and servicing. The use of fire extinguishers, control of tools and equipment when working on aircraft. Protection of the aircraft against mechanical damage during maintenance.

1.7 A general knowledge of the procedures and precautions to ensure continued airworthiness of spare parts and materials in transit and storage.

1.8 A general knowledge of elementary magnetic and electro magnetic principles; basic laws and units; properties and application of magnetic materials; principles of operation of common electromagnetic devices.

1.9 A detailed knowledge of DC electrical theory; basic laws and units; voltage, current and power distribution in DC circuits; effect of resistance, DC circuits. A general knowledge of electrolysis; primary and secondary cells; elementary calculations associated with simple circuits.

1.10 A general knowledge of the ability to prepare an electrical circuit diagram, and to interpret electrical / electronic diagrams and symbols. The preparation of a sketch to show a typical installation, or to explain a principle of operation; the preparation of a report in the event of a defect.

1.11 A detailed knowledge of the application and identification of electrical cables used in aircraft installations, typical characteristics, ratings and limitations; testing and inspection; the assembly and repair of cable harnesses; crimping and soldering techniques; the installation of electrical harnesses into aircraft; bonding, continuity and insulation tests. The methods of making, and subsequent inspection of termination. The processes and methods of connecting terminations of posts and aircraft structures, the tests and inspections required after making such connections. Circuit protection; characteristics and types of fuses and fuse gear.

1.12 A detailed knowledge of the principles of operation of electrical indicating instruments (Eg. voltmeter, ammeter, ohmmeter, bonding tester, insulation tester, watt meters and frequency meter), applications and limitations; shunts, multipliers; theory and use of bridges and potentiometers, multi – range instruments; calibration of test equipment and typical acceptable tolerances.

1.13 A general knowledge of the principles of construction and functioning of electrical storage batteries.

1.14 A general knowledge of the periodic testing of batteries; capacity, insulation and leak testing; charging procedures; calculation of efficiency; variable factors affecting results of tests; maintenance practices, battery room equipment and practices, storage of batteries and battery records.

1.15 A detailed knowledge of the fundamental principles of motor and generator operation; relevant laws. Basic types of machines; differences in construction and operation; primary characteristics of types; typical applications; effects of typical faults; methods or inspecting and testing.

1.16 A general knowledge of the fundamental methods of controlling speed, torque and direction of rotation of motors; equipment used, and principles of operation.

1.17 A general knowledge of the fundamental principles of operation of switch gear, including contractors, relays and circuit breakers.

1.18 A general knowledge of the fundamental principles of typical DC main and stand-by power generating systems; associated control and protection devices, including voltage regulators, differential and simple cut-outs, typical methods of paralleling DC generators.

1.19 A general knowledge of the fundamental principles of operation of typical secondary a. c. power systems including static and rotary inverters, their methods of control, indication and testing.

1.20 A general knowledge of the principles of operation of typical electrical services (Eg. fire detection and protection, engine starting) built-in test and self monitoring facilities where applicable

1.21 A general knowledge of aircraft systems using, or associated with electrical equipment to the extent necessary to determine the serviceability of the electrical equipment.

2. Alternating Current Power

2.1 A detailed knowledge of AC electrical theory, including RMS values, power factors and simple vectors; the combined effect of resistance, inductance and capacitance in simple circuits; definition of terms and their application; elementary calculations involved with simple circuits.

2.2 A general knowledge of the functioning, application and limitations of thermionic valves and semi conductor devices; the precautions to be observed when testing them

2.3 A general knowledge of different types of transformers; fundamental differences and typical applications; general constructional principles of the various types; general effects of transformers on the circuits in which they are used (Eg. phase shifting); inspection ad test of transformers as found in aircraft installations.

2.4 A general knowledge of the functioning of rotary transformers; conversion of AC/DC., DC/AC; the general principles of voltage regulations, stabilization and filtering of supplies, and transient protection; basic types of rectifier device half wave and full wave rectification of single and multi – phase supplies.

2.5 A general knowledge of different types of amplifier; typical applications; general working principles of small – signal and power amplifiers using valves or transistors; basic operating principles of magnetic amplifiers (small – signal and power types), including biasing and excitation; uses and effects of positive or negative feedback in amplifiers.

2.6 A general knowledge of different types AC motors used on aircraft; fundamental differences and typical applications; principles of operation of common types of AC motor (Eg. squirrel cage induction); general methods of controlling torque, speed and direction of rotation; principles of operation of typical switching and control circuits.

2.7 A general knowledge of the principles of typical AC main stand-by power generation systems. The associated control and protection devices. The operation of typical voltage regulations (carbon pile, magnetic and semi conductor)

2.8 A general knowledge of the principles and problems involved in paralleling AC generators; load sharing systems.

2.9 A general knowledge of the fundamental principles of operation of typical AC electrical services (Eg. fire detection, anti-icing) built-in test and self-monitoring facilities.

2.10 A general knowledge of the working principles of non-electrical systems using, or associated with, AC electrical equipment (Eg. constant – speed drive units, air conditioning systems) to the extent necessary to determine the serviceability of the electrical equipment.

2.11 A general knowledge of synchro-transmission systems and their uses.

2.12 A general knowledge of the principles, terminology, and symbols of logic networks commonly used in aircraft electrical systems.

2.13 A general knowledge of the operation, control and protection of Auxiliary Power Units, Function of power generation, DC/AC motor operated actuators; method of speed and rotational control, clutches and brakes.

2.14 A general knowledge of the flight Controls; Principles, operation and maintenance of Power Control Units (PCU), flap motors protection and control and trim motors, Fly-by-wire flight control systems (digital and analog), full authority systems and manual reversion systems. Fuel systems; buster pump operation, control, construction and indication. Function and operation of electrically controlled fuel valves. Function and operation of Hydraulic system electrical pumps and valves. Function and operation of electrically controlled pneumatic devices and valves. Operation of Landing Gear systems.

2.15 A general knowledge of the propeller and engine control systems; electrical propeller synchronization, testing of electrical feathering systems. Full Authority Digital Engine Control (FADEC). Function and operation of electrical engine temperature and speed limiting system.

2.16 A general knowledge of the ignition System of piston and turbine engines; operation and layout of high energy ignition units, igniter plugs, types, construction and maintenance.

2.17 A detailed knowledge of the fire detection and extinguishing systems, Aircraft lighting, Ice and rain protections, Centralized warning and indication systems, galley and toilet service systems, Ground electrical power supply.

AIRCRAFT MAINTENANCE ENGINEERS – BASIC LICENCE EXAMINATION SYLLABUS

SYLLABUS OF EXAMINATION FOR CATEGORY "X" INSTRUMENT.

General

A general knowledge of Sri Lanka Air Navigation Regulations pertaining to Airworthiness of Aircraft and duties of a licensed Engineer.

1 Aircraft Instruments

1.1 A general knowledge of the practical mathematics, involving vulgar and decimal fractions, percentages, measurements, logarithms, power of numbers, elementary trigonometry, graphs, transposition of formulas and solution of simple equations; general knowledge of the SI system and methods of conversion.

1.2 A detailed knowledge of the interpretation of engineering drawings, including symbols and projections; revision procedures for diagrams and manuals; control of maintenance documentation. A general understanding of the specifications for technical data. (Eg. ATA 100 Specifications)

1.3 A detailed knowledge of the inspection of screwed parts (including pipe coupling) or defects, damage, and locking; the type of screw threads used.

1.4 A detailed knowledge of the inspection of, and common defects associated with, locking devices, and hard and soft soldering.

1.5 A general knowledge of the fire and safety precautions associated with general hand tools simple machine tools and precision measuring equipment.

1.6 A general knowledge of the fire and safety precautions to be observed during aircraft maintenance and servicing. The use of fire extinguishers, control of tools and equipment when working on aircraft. Protection of the aircraft against mechanical damage during maintenance.

1.7 A detailed knowledge of the procedures and precautions to ensure continued airworthiness of spare parts and materials in transit and storage.

1.8 A general knowledge of elementary magnetic and electro magnetic principles; basic laws and units; properties and application of magnetic materials; principles of operation of common electromagnetic devices.

1.9 A general knowledge of AC and DC electrical theory, basic laws and units, voltage, current and power distribution in AC and DC circuits, effect of resistance, inductance and capacitance in DC circuits. Calculations associated with simple circuits.

1.10 A general knowledge of the ability to prepare an electrical circuit diagram, and to interpret electrical / electronic diagrams and symbols. The preparation of a sketch to show a typical installation, or to explain a principle of operation, the preparation of a report in the event of a defect.

1.11 A general knowledge of the application and identification of electrical cables used in aircraft installations, typical characteristics, ratings and limitations, testing and inspection, the assembly and repair of cable harnesses, crimping and soldering techniques, bonding, continuity and insulation tests. The methods of making, and subsequent inspection of, terminals. Circuit protection, switches, circuit breakers and fuses.

1.12 A detailed knowledge of the principles of operation of electrical indicating instruments (Eg. voltmeter, ammeter, ohmmeter, bonding tester, insulation tester, watt meters and frequency meter), applications and limitations, shunts, multipliers, theory and use of bridges and potentiometers, multi – range instruments; calibration of test equipment and typical acceptable tolerances.

1.13 A general knowledge of the atmospheric physics, including Boyle's law, Charles' law, composition of the atmosphere, factors affecting its weight, density and temperature, altitude. A general knowledge of barometers, including barometers, types and applications, standard conditions (Eg British Standards), factors affecting accuracy, determination and application of corrections; practical uses.

1.14 A general knowledge of the basic gyroscope theory, including – rigidity and precession. A general knowledge of gyroscopes, including – gyroscope types, differences and typical applications, methods to rotate and erect gyroscopes (both electrical and air – driven), the effects of acceleration, and methods of overcoming the errors this introduces.

1.15 A general knowledge of the fundamental principles of operation of physically, mechanically and electrically operated instruments and instruments systems installed in aircraft.

1.16 A general knowledge of the instrumental principles of operation of simple electronic aircraft instruments systems (Eg. fuel quantity, servo temperature indicating systems), excluding flight path and air data computation and inertial navigation systems.

1.17 A general knowledge of pressure measuring devices - operation, function and construction of capsules, diaphragms, bellows (absolute and differential).

1.18 A detailed knowledge of the pitot static systems – operation and construction, layout of typical pitot static system, pressure error and its effect on the system, maintenance and leak testing.

1.19 A detailed knowledge of the altimeters, Vertical speed indicators and Air speed indicators – operation and constructions, temperature effect and atmospheric pressure, appropriate features pertaining to purpose of constructions.

1.20 A detailed knowledge of miscellaneous altitude systems, servo altimeters and air data computers,

1.21 A general knowledge of the types of defects which may develop in operation of an instrument system, the methods adopted to diagnosis and rectify faults.

1.22 A general knowledge of synchronous transmitting systems and their uses, engine indication systems.

1.23 A general knowledge of the functioning, application and limitations of semi conductor devices, and the precautions to be observed when testing them.

1.24 A general knowledge of aircraft systems using or associated with, instrument equipment to the extent necessary to determine the serviceability of the instrument, equipment or system.

1.25 A detail knowledge of Artificial horizons (AH), Turn and bank and turn coordinators, Directional gyros (DG), Compass system, Ground proximity warning system (GPWS).

2. Flight path and air data computation

2.1 A general knowledge of electronic circuits, including – voltage stabilization, filtering and transient protection, methods of developing signals, amplification, summation, phase discrimination, and the terms used. A general knowledge of amplifier types, including – working principles of small power amplifier using valves and / or transistors, basic operating principles of magnetic amplifiers, including biasing and excitation; uses and effect of positive or negative feedback in amplifiers

2.2 A detailed knowledge of the fundamental principles, terminology, and symbols of logic networks commonly used in aircraft instrument systems.

2.3 A general knowledge of the principles, terminology, and symbols of logic networks commonly used in aircraft instrument systems.

2.4 A general knowledge of the techniques used in analog and digital computing and to direct instrument systems; analog / digital and digital / analog conversion; the binary code, application of computer technology, data storage.

2.5 A general knowledge of eh fundamental principles of aircraft air data computation and associated instruments and systems; the principle of inspecting and testing such systems.

2.6 A general knowledge of the fundamental principles of flight director computation and presentation, methods of obtaining signal inputs methods by which displays are presented, the principles of inspecting and testing such a system in situ.

2.7 A general knowledge of aircraft radio courses capable of being coupled to a Flight Director.

2.8 A general knowledge of the fundamental principles of flight recording systems, flight data and cockpit voice recording system (FDR/CVR), Electronic instrument and information display system, including methods of obtaining signal inputs to the system, type and methods by which signals are modified for use in a system, methods by which the system is checking, methods of data retrieval.

3 Inertial Navigation

3.1 A general knowledge of the fundamental principles of accelerometers, including the errors associated with the use of accelerometers in inertial navigation; and the principles employed to reduce these errors

3.2 A general knowledge of rate and displacement gyros as applicable to inertial navigation platforms, gimbals arrangements for platforms, the principles of earth rotation rate compensation; the principles of transport rate compensation.

3.3 A general knowledge of the fundamentals of the Schuler pendulum, Schuler tuning

3.4 A general knowledge of the principles of gyro-compassing systems and under azimuth system

3.5 A general knowledge of the programming and types of information display.

3.6 A detailed knowledge of the principles of functional testing and fault diagnosis of a typical inertial navigation system

3.7 A general knowledge of digital computing as appropriate to inertial Navigation, binary coded decimal; octal / binary conversion. A general knowledge of the major working sections of a digital computer, inter-relationship between section; methods of data transfer.

4. Automatic Flight Control System

4.1 A general knowledge of the Fundamentals of Automatic Flight Control System – Understanding the terms; authority, single axis autopilot, wing leveler and auto-stabilizer, couple, engaged, capture, crosswind effect, gain, washout, cone of confusion.

4.2 A general knowledge of the operation and typical layout of a single axis (roll) Auto Flight Control System, understanding of inner loop stabilization and outer loop control, methods by which roll and yaw error signals are sensed in rate, displacement and inclined rate gyros. Operation and construction of duplex, electro-pneumatic, electro-mechanical and electro-hydraulic servo-motors. Difference between series and parallel connected servo-motors.

4.3 A detailed knowledge of the Command signal processing/turbulence penetration – altitude changes are detected in roll, pitch and yaw. Method and purpose of achieving synchronization, limiting, gain and adoptive control through signal processing within an autopilot system.

4.4 A detailed knowledge of the Roll channel operation in the modes of – basic stabilization, turn command, heading hold, VHF ominidirectional radio range.

4.5 A detailed knowledge of the Pitch channel operation in the modes of – basic stabilization, pitch command, altitude hold, vertical speed, mach hold. Operation and purpose of a mach trim system.

4.6 A general knowledge of the function of yaw dampers in Automatic Flight Control System, interaction of a yaw damper with an autopilot system, understanding of Dutch Roll phenomenon, aileron and rudder control interaction during turns.

4.7 A general knowledge of the automatic trim control, Autopilot navigation aids interface, Flight director systems and maintenance of systems.

AIRCRAFT MAINTENANCE ENGINEERS – BASIC LICENCE EXAMINATION SYLLABUS

SYLLABUS OF EXAMINATION FOR CATEGORY "X" – RADIO

General

A general knowledge of Sri Lanka Air Navigation Regulations pertaining to Airworthiness of Aircraft and duties of a licensed Engineer.

1. Knowledge on General Subjects

1.1 A general knowledge of the practical mathematics, involving vulgar and decimal fractions, percentages, measurements, logarithms, power of numbers, elementary trigonometry, graphs, transposition of formulas and solution of simple equations, general knowledge of the SI system and methods of conversion.

1.2 A detailed knowledge of the interpretation of engineering drawings, including symbols and projections; revision procedures for diagrams and manuals; control of maintenance documentation. A general understanding of the specifications for technical data. (Eg. ATA 100 Specifications).

1.3 A detailed knowledge of the inspection of, and common defects associated with, locking devices, and hard and soft soldering.

1.4 A general knowledge of the practices and necessary precautions associated with general hand tools simple machine tools and precision measuring equipment.

1.5 A general knowledge of the procedures and precautions to ensure continued airworthiness of spare parts and materials in transit and storage.

1.6 A general knowledge of elementary magnetic and electro magnetic principles; basic laws and units, properties and application of magnetic materials; principles of operation of common electromagnetic devices.

1.7 A general knowledge of AC and DC electrical theory; basic laws and units; voltage, current and power distribution in AC and DC circuits; effect of resistance, inductance and capacitance in circuits. Calculations associated with simple circuits.

1.8 A general knowledge of the ability to prepare and electrical circuits diagrams, to interpret electrical / electronic diagrams and symbols.

1.9 A general knowledge of the application and identification of electrical cables used in aircraft installations, typical characteristics, ratings and limitations; testing and inspection; the assembly and repair of cable harnesses; crimping and soldering techniques; bonding, continuity and insulation tests. The methods of making, and subsequent inspection of, terminations. Circuit protection; switches, circuit breakers and fuses.

1.10 A detailed knowledge of the principles of operation of electrical indicating instruments (Eg. voltmeter, ammeter, ohmmeter, bonding tester, insulation tester, watt meters and frequency meter), applications and limitations; shunts, multipliers; theory and use of bridges and potentiometers, multi – range instruments; calibration of test equipment and typical acceptable tolerances.

1.11 A general knowledge of the functioning, application and limitations of semi-conductor devices and the precautions to be observed when testing them.

1.12 A general knowledge of aircraft systems using or associated with instrument equipment to the extent necessary to determine the serviceability of the instrument equipment or systems.

2. Radio Fundamentals and Radio Navigation Systems

2.1 Radio theory

A detailed knowledge of the Propagation of radio waves, polarization, radiation patterns, transmitters and receivers, RF Amps, Intermediate Frequency Oscillators, frequency synthesizers, frequency multipliers, mixers, detectors, Beat Frequency Oscillators (BFO), Automatic Gain

Controller (AGC), noise limiters, muting circuits, audio amplifiers, modulators, Radio Frequency power amplifiers, matching units, filters and tuned circuits.

2.2 Circuit Analysis

A general knowledge of the analysis of Capacitance, capacitive reactance, inductance, and L, C and R circuits. Resonant circuits; series and parallel. Operation amplifiers, comparators, voltage followers, adders and subtractors.

2.3 Transmission lines

A general knowledge of the characteristics and construction of transmission lines of; parallel wire, coaxial cable, waveguide, skin effect. Understanding of the; characteristic impedance, reflected power, forward power, standing wave ratio balanced line, unbalanced line, velocity factors.

2.4 Interference

A detailed knowledge of the Principles and methods used to minimize the effect of conducted and radiated interference; methods used to minimize the effects of lightning strikes and static on aerials.

2.5 Aerial and Feeders

A general knowledge of the Diplexers, baluns and matching stubs; fixed and variable matching arrangements, locations and type of aerials – communication and navigation; bandwidth and effective height of an aerial.

2.6 Communication

A detailed knowledge of the Calculation of standing wave ratio; control and monitoring circuits.

2.7 Pulse Techniques

A general knowledge of the principles of Radio transmitter/receiver; Amplitude modulation, Frequency modulation, Radio frequency amplifier, local oscillators, mixers, Inter Mediate frequency amplifiers, Radio frequency amplifiers. Operation construction of and characteristics of head phones, speakers and microphones. Single Side Bands, AM, FM, band with, modulation index, clipping, harmonics, high-level modulation, frequency stability, output power, parasitic oscillation, neutralization.
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.

2.8 Audio Systems

A general knowledge of the intercommunication; audio mixing and distribution system; public address and entrainment system; headsets and microphones.

2.9 Cockpit Voice Recorders

A general knowledge of the purpose and requirement. Cockpit microphones including locations and concept of ‘Hot’ and ‘Area’ microphones. Signal sources; control circuit. System testing in aircraft. Underwater locater beacon (audio and visual). CVR protection against shock, fire, immersion in fluids, and erasure of recordings.

2.10 VHF/ HF Communications systems

A detailed knowledge of the system block diagram, airborne installations; emergency locator transmitters (ELT)

2.11 VOR / ILS/MLS System

A detailed knowledge of the Ground station signals; airborne installations; control, monitors, loading; AFCS and instrument interface. Airborne RX block diagrams and operation.

2.12 Marker Systems

A general knowledge of the Ground installations; airborne systems, marker receiver block diagram and operation.

2.13 Automatic Direction Finding Systems

A detailed knowledge of the Receiver; loop and sense aerial and feeders; bearing errors and corrections devices; loop swings. ADF RX block diagram and operation.

2.14 VLF and Hydraulic Systems

A general knowledge of the Receiver, Computer; displays; interface with other systems.

2.15 Primary Radar Systems

A general knowledge of the weather radar; control and monitoring circuits, indicators, displays, scanners, waveguides, doppler; aerials, indicators, interface with other aircraft equipment; radio altimeters; pulse and PM CW systems; displays; interface with other aircraft systems; loran C.

2.16 Secondary Radar Systems

A detailed knowledge of the DME; indicators, control and monitor circuits, interface with other aircraft systems; ATC transponders; instrument system interface, control and monitor circuits.

AIRCRAFT MAINTENANCE ENGINEERS – BASIC LICENCE EXAMINATION SYLLABUS

SYLLABUS OF EXAMINATION FOR CATEGORY "A" – PRESSURIZED METAL AEROPLANES

1. A general knowledge of Sri Lanka Air Navigation Regulations pertaining to Airworthiness of Aircraft and duties of a licensed engineer.

2. A general knowledge of the practical mathematics, involving vulgar and decimal fractions, percentages, measurements, logarithms, powers of numbers, elementary trigonometry, graphs, general knowledge of the SI system and methods of conversion.

3. A detailed knowledge of the interpretation of engineering drawings, including symbols and projections; revision procedures for drawings and manuals; control of maintenance documentation. A general understanding of the specifications for technical data (Eg. ATA 100 specifications)

4. A general knowledge of the use of hand tools, simple machine tools and precision measuring instruments.

5. A detailed knowledge of the identification of and terminology associated with flexible cables; screw threads including inserts; fastening devices; bolts nuts and screws; locking devices, rivets; taper pins; sheet metal; pipes and unions; fuel lubricants and compound; gases (Eg. oxygen nitrogen and compressed air)

6. A general knowledge of the inspections of, and the common defects associated with flexible cables; screw threads including inserts; fastening devices; rivets; taper pins; ball and roller bearings; pipes; hard and soft soldering.

7. A general knowledge of the reasons for heat treating materials, and of the identification and control of parts which have been so treated.

8. A detailed knowledge of the deterioration and characteristic defects of metals, the methods of rectification of such faults and the methods of subsequent re-protection. Types of corrosion and corrosion prone areas of the aircraft.

9. A general knowledge of the purpose, and limitations of use of non destructive testing techniques, including “X” ray, ultrasonic and eddy-current systems.

10. A detailed knowledge of the application of hot oil and chalk, dye and fluorescent penetrant techniques, and the subsequent inspection of the parts.

11. A general understanding of the following electrical terms-voltage, current resistance, power, capacitance, DC/AC systems. A general understanding of simple circuits and batteries.

12. A general Knowledge of the inspections and tests applied to determine the condition of installed electrical cables and bonding. Forging, welding, soldering and brazing.

13. A general knowledge of the fire and safety precautions to be observed during aircraft maintenance and servicing. The use of fire extinguishers, control of tools and equipment when working on aircraft. Protection of the aircraft against mechanical damage during maintenance.

14. A general knowledge of the terms thrust; weight; lift; drag; exes; moment; aspect ratio; angle of attack; centre of pressure; centre of gravity; incidence; dihedral, aerofoil; boundary layer; stall.

15. A general knowledge of the aircraft stability and control; effects of movement of centre of pressure and centre of gravity; forces acting upon an aeroplanes in changing flight conditions; methods of achieving stability; types of control surfaces and lift control devices; their directions and effect of movement; simple stall warning devices.

16. A general knowledge of the terms stressed skin; monocoque structure, semi-monocoque structure; production breaks; station number; primary; secondary and tertiary structure; longeron; bulkhead; frame rib; stringer; tear stoppers; shear ties, safe life, damage tolerance, fail-safe, aerodynamic and static loading.

17. A general knowledge of the function, maintenance and inspection of the following;

(a) Structure and structural components constructed from metal, glass fiber, glass reinforced plastic, vinyl, Perspex
(b) Furnishing materials, paints surface finishes and associated materials
(c) Elementary flying controls, hydraulics, pneumatics and air systems, landing gears, brakes, nose wheel steering ice and rain protection, fire warning and extinguishing, wheels tyres.
(d) Windows; doors and emergency exits. Windshield repairs

18. A detailed knowledge of fabric materials used on aircraft structures the types of defects associated with them, inspections for deterioration, and the method of rectification and re-protection procedures for testing the soundness of these materials

19. A general knowledge of the inspections and checks required after heavy landings, lighting strikes, mercury spillage and abnormal flight loads

20. A general knowledge of the periodic inspections necessary to check the serviceability of life saving and safety equipment.

21. A general knowledge of the principles of operation, and in-situ testing to prove serviceability of pressure, gyroscopic simple AC and DC operated instruments, pitot / static systems and associated instruments.

22. A general knowledge of the methods used for, and the precautions taken during aircraft ground handling, jacking, towing, parking, ground de-icing and supplying ground power.

23. A detailed knowledge of the method of preventing external and internal deterioration of the airframe and systems when the aeroplane is out of use for extended periods. Long term and short term preservation of aircraft and systems.

24. A detailed knowledge of the preparation of a brief report, illustrated by sketches if necessary, describing the replacements or repairs required in the event of damage defect or wear.

25. A detailed knowledge of the preparation of a sketch to illustrate a simple mechanical, electrical, hydraulic or pneumatic system.

26. A general understanding of the terms subsonic, transonic, and supersonic, flow; shock wave; dutch roll, mach trim, feel trim changes spoilers wing fences stall warning and identification.

27. A general knowledge of the following airframe systems and components flying controls including power operated / assisted hydraulics; landing gear wheels tyres brakes anti-skid and steering ice and rain protection cabin pressurization, humidity control and air conditioning system, environmental control, oxygen, life saving equipment including inflatable slides dinghies and rafts.

28. A general knowledge of the fuel supply system, toilet and water vast system. Ram air supply system.

AIRCRAFT MAINTENANCE ENGINEERS – BASIC LICENCE EXAMINATION SYLLABUS

SYLLABUS OF EXAMINATION FOR CATEGORY "A" – UN-PRESSURIZED AEROPLANES

1. A general knowledge of Sri Lanka Air Navigation Regulations pertaining to Airworthiness of Aircraft and duties of a licensed engineer.

2. A general knowledge of the practical mathematics, involving vulgar and decimal fractions, percentages, measurements, logarithms, power of numbers, elementary trigonometry, graphs,

transposition of formulas and solution of simple equations; general knowledge of the SI system and methods of conversion.

3. A detailed knowledge of the interpretation of engineering drawings, including symbols and projections; revision procedures for drawings and manuals; control of maintenance documentation. A general understanding of the specifications for technical data (Eg. ATA 100 specifications)

4. A general knowledge of the use of hand tools, simple machine tools and precision measuring instruments.

5. A detailed knowledge of the identification of and terminology associated with flexible cables, screw threads including inserts, fastening devices, bolts, nuts and screws, locking devices, rivets, taper pins, sheet metal, pipes and unions, fuels lubricants and compounds, gases (eg. Oxygen nitrogen and compressed air)

6. A general knowledge of the inspections of and the common defects associated with flexible cables, screw threads including inserts, fastening devices, bolts nuts and screws, locking devices, rivets, taper pins, ball and roller bearings, pipes, hard and soft soldering.

7. A general knowledge of the reasons for heat treating materials and of the identification and control of parts which have been so treated.

8. A detailed knowledge of the deterioration and characteristic defects of metals, the methods of rectification of such faults and the methods of subsequent re-protection.

9. A general knowledge of the purpose, and limitations of use of non-destructive testing techniques, including x-ray, ultra-sonic and eddy current.

10. A detailed knowledge of the application of hot oil and chalk, dye and fluorescent penetrant techniques and the subsequent inspection of the parts.

11. A general knowledge of the following electrical terms-voltage, current, resistance, power, capacitance, AC/DC and general understanding of simple circuits and batteries.

12. A general knowledge of the inspections and tests applied to determine the condition of installed electrical cables and bonding.

13. A general knowledge of the fire and safety precautions to be observed during aircraft maintenance and servicing the use of fire extinguishers, control of tools and equipment when working on aircraft, Protection of the aircraft against mechanical damage during maintenance.

14. A general knowledge of the terms thrust; weight; lift; drag; exes; moment; aspect ratio; angle of attack; centre of pressure; centre of gravity; incidence; dihedral, aerofoil; boundary layer; stall.

15. A general knowledge of aircraft stability and control; effects of movement of centre of pressure and centre of gravity; forces acting upon an aeroplane in changing flight conditions; methods of achieving stability; types of control surfaces and lift control devices; their directions and effect of movement; simple stall warning devices.

16. A general knowledge of the terms stressed skin; monocoque structure, semi-monocoque structure; production breaks; station number; primary; secondary and tertiary structure; longeron; bulkhead; frame rib; stringer; tear stoppers; shear ties, safe life, fall safe and damage tolerance structures, aerodynamic and static loading.

17. A general knowledge of the function, maintenance and inspection of the following;

    (a) Structure and structural components constructed from metal, glass fiber, glass reinforced plastic, vinyl, Perspex.
    (b) Furnishing materials, paints surface finishes and associated materials.
    (c) Elementary flying controls, hydraulics, pneumatics, landing gear brakes, nose wheel steering, shimmy dampers, fire warning and extinguishing, oxygen, air conditioning systems; wheel tyres. Fuel supply system.
    (d) Windows; doors and emergency exits.

18. A detailed knowledge of fabric materials used on aircraft structures the types of defects associated with them, inspections for deterioration, and the method of rectification and re-protection procedures for testing the soundness of these materials

19. A general knowledge of the inspections and checks required after heavy landings, lighting strikes and abnormal flight loads.

20. A general knowledge of the periodic inspections.

21. A general knowledge of the methods used for, and the precautions taken during aircraft ground handling, jacking, towing, parking.

22. A detailed knowledge of the method of preventing external and internal deterioration of the airframe and systems when the aeroplane is out of use for extended periods. Long term and short term preservation of aircraft and systems.

23. A general knowledge of the preparation of a brief report, illustrated by sketches if necessary, describing the replacements or repairs required in the event of damage defect or wear.

AIRCRAFT MAINTENANCE ENGINEERS – BASIC LICENCE EXAMINATION SYLLABUS

SYLLABUS OF EXAMINATION FOR CATEGORY "C" – JET TURBINE ENGINES

1. A general knowledge of Sri Lanka Air Navigation Regulations pertaining to Airworthiness of Aircraft and duties of a licensed engineer.

2. A general knowledge of the practical mathematics, involving vulgar and decimal fractions, percentages, measurements, logarithms, powers of numbers, elementary trigonometry, graphs, general knowledge of the SI system and methods of conversion.

3. A detailed knowledge of the interpretation of engineering drawings, including symbols and projections; revision procedures for drawings and manuals; control of maintenance documentation. A general understanding of the specifications for technical data (Eg. ATA 100 specifications))

4. A general knowledge of the use of hand tools simple machine tools and precision measuring instruments.

5. A detailed knowledge of the identification of, and terminology associated with flexible cables; screw threads including inserts; fastening devices, bolts nuts and screws; screw repairs, locking devices, rivets, taper pins, sheet metal; pipes and unions, fuels, lubricants and compounds; gases, (Eg. oxygen, nitrogen and compressed air).

6. A general knowledge of the inspections of and the common defects associated with flexible cables; screw threads including inserts; fastening devices, locking devices; rivets; paper pins; ball and roller bearings; pipes; hard and soft soldering.

7. A general knowledge of the reasons for heat treating materials, and of the identification and control of parts which have been so treated.

8. A detailed knowledge of the deterioration and characteristic defects of metals, the methods of rectification of such faults and the methods of subsequent re-protection.

9. A general knowledge of the purpose, and limitations of use, of non-destructive testing techniques, baroscopic inspection techniques, including x-ray, ultrasonic and eddy current techniques.

10. A detailed knowledge of the application of hot oil and chalk dye and fluorescent penetrant techniques, and the subsequent inspection of the parts.

11. A general understanding of the following electrical terms-voltage, current, resistance, power, capacitance, AC and DC systems. A general understanding of simple circuits and batteries.

12. A general knowledge of the inspection and tests applied to determine the condition of installed electrical cables and bonding.

13. A general knowledge of the fire and safety precautions to be observed during engine maintenance and servicing. The use of fire extinguishers, control of tools and equipment when working on turbine engines. Protection of the turbine engine against mechanical damage during maintenance.

14. A general knowledge of the fundamental principles; Charles' and Boyle's Gas Laws; Newton's Laws of Motion; and Bernoulli's Theorem. Potential energy, kinetic energy, adiabatic, thermal and propulsive energy efficiencies and ways of derive them.
15. A general knowledge of the principles of operation, and in situ testing to prove serviceability of, mechanically, electrically and pressure operated instruments.

16. A general knowledge of the preparation of a brief report, illustrated by sketches if necessary, describing the replacements or repairs required in the event of damage, defect or wear of engines and associated systems.

17. A detailed knowledge of the preparation of sketch to illustrate a simple mechanical. Electrical or fluid system.

18. A general knowledge of the terms constant pressure cycle; Brayton cycle, convergent, divergent, diffuser, engine pressure ratio; choked nozzle, supersonic, subsonic air flow, thrust mass flow; by-pass; primary; secondary and tertiary air; creep; impulse; reaction; surge; modular construction; core engine; hot and cold stream flows.

19. A detailed knowledge of the purpose and functioning of all parts of turbine engines. Turbo jet, turbo fan, turbo shaft, turboprop, prop fan and ducted fan, combustion section, turbine section, exhaust section.

20. A general knowledge of the function, maintenance and inspection of the following; power-plant structure; air intake systems; exhaust systems; ignition system; engine fuel and water injection systems lubrication systems; fire detection and extinguishing systems; constant speed drives, engine control systems; principle of operation, typical location of components, linkages, controls and connection of fuel control units, mechanical control inputs and outputs for electrical fuel control systems, throttle/power/condition leaver, cables and linkages, full authority digital engine control. Airframe fuel systems; engine starting systems; ice and rain protection systems; reverse thrust and re-heat systems.

21. A detailed knowledge of the centrifugal compressors; single and multi stage compressors, impellers, diffusers and inlet guide vanes, pressure ratios, inspection and balancing. Axial compressors; single spool, dual/twin spool and triple spool, purpose and function of rotor blades, stator blades, fixed inlet guide vanes, variable inlet guide vanes. Compressor operation; compressor stall and surge, flow control, bleed valves, variable inlet guide vanes and rotating stator blades. Compressor rations and ways to derive it.

22. A general knowledge of the procedures and precautions necessary to prevent gas turbine engines and associated systems from deteriorating whilst out of service.

23. A general knowledge of the classification and properties of lubricants and fuels; viscosity and viscosity index, synthetic base lubricant, low volatility, anti-forming quality, low lacquers and coke deposit, high flashpoint and low pour point, fire hazard, fuel icing and corrosion characteristic, specific gravity, calorific value, fuel additives, anti-icing and anti-microbiological. Ground handling requirements and safety precautions to be observed in relation to fuel, oils and additives. Exposure to skin or eyes, flammability, misting, vaporization rate, contamination and corrosion. Lubrication system; gas turbine lubrication system, typical location of oil tank, oil pumps, oil filters, oil coolers, vent system and scavenge system.

24. A general knowledge of the fuel control and metering system; starting control, acceleration scheduling, over-speed governing, power limiting, temperature limiting, density/altitude/outside air temperature/airspeed compensation and shutdown control. Fuel control units; hydro-pneumatic, hydro mechanical and electromechanical, governors and limiting devices, engine sensing variables and valves.

25. A detailed knowledge of the Engine air system; air distribution and anti-ice control system including internal cooling, sealing and external air service. Air cooling/sealing components and locations, air starting system components, anti-ice, anti-surge, bleed and air distribution systems.

26. A detailed knowledge of the Starting and ignition systems; electric starters, starter generators, air turbine starters, turbo starter system, pressure regulating and shut-off valves. Engine ignition system and their components, igniter and glow plugs and harnesses. Safety precautions in maintenance of engine ignition system. Power augmentation system; water/methanol injection

systems, augmentation system components and the fuel control system, burner ignition, jet pipe, cooling air flow and heat shield.

27. A detailed knowledge of the Engine operation, maintenance and ground running; pre-start checks prior to ground running, general procedures for starting, ground run and stopping, defect rectification using typical manufactures' data, power limitation/performance chart, trend monitoring pertaining to engine condition. Determination of engine condition/defects from obtained data. Hot section inspection, compressor washing and soft blasting.

28. A detailed knowledge of the Engine installation, storage and preservation; firewall, cowlings, acoustic panels, mountings, anti-vibration mounts, hoses, pipes, wiring looms, control cables and rods, lifting points and drains. Blade containment area/rings. Preservation and de-preservation of gas turbine engines.

29. A detailed knowledge of the Fuel system; operation, control, construction and indication, fuel booster pumps, refuel/de-fuel, feed, jettison and cross-feed systems. Fuel valve operation and control.

AIRCRAFT MAINTENANCE ENGINEERS – BASIC LICENCE EXAMINATION

SYLLABUS OF EXAMINATION FOR CATEGORY "C" – PISTON ENGINE

1. A general knowledge of Sri Lanka Air Navigation Regulations pertaining to Airworthiness of Aircraft and duties of a licensed engineer.

2. A general knowledge of the practical mathematics, involving vulgar and decimal fractions, percentages, measurements, logarithms, power of numbers, elementary trigonometry, graphs, transposition of formulas and solution of simple equations; general knowledge of the SI system and methods of conversion.

3. A detailed knowledge of the interpretation of engineering drawings, including symbols and projections; revision procedures for drawings and manuals; control of maintenance documentation. A general understanding of the specifications for technical data (Eg. ATA 100 specifications)

4. A general knowledge of the use of hand tools, simple machine tools and precision measuring instruments.

5. A detailed knowledge of the identification of and terminology associated with flexible cables, screw threads including inserts, fastening devices, bolts, nuts and screws and screw repair methods, locking devices, rivets, taper pins, sheet metal, pipes and unions, fuels lubricants and compounds, gases (Eg. Oxygen nitrogen and compressed air)

6. A general knowledge of the inspections of and the common defects associated with flexible cables, screw threads including inserts, fastening devices, bolts nuts and screws, locking deicers, rivets, taper pins, ball and roller bearings, pipes, hard and soft soldering.

7. A general knowledge of the reasons for heat treating materials and of the identification and control of parts which have been so treated.

8. A detailed knowledge of the deterioration and characteristic defects of metals, the methods of rectification of such faults and the methods of subsequent re-protection.

9. A general knowledge of the purpose, and limitations of use of non-destructive testing techniques, baroscopic inspection methods, including x-ray, ultra-sonic and eddy current.

10. A detailed knowledge of the application of hot oil and chalk, dye and fluorescent penetrant techniques and the subsequent inspection of the parts.

11. A general understanding of the following electrical terms-voltage, current, resistance, power, capacitance, DC and AC systems. A general understanding of simple circuits and batteries.

12. A general understanding of Charles' Boyle's Gag Laws, Newton's Laws of Motion and Bernoulli's Theorem

13. A general knowledge of the principles of operation, and in situ testing to prove serviceability of, mechanically, electrically and pressure operated instruments.

14. A detailed knowledge of the preparation of a brief report, illustrated by sketches if necessary, describing the replacements or repairs required in the event of damage, defect or wear of piston engines and associated systems

15. A detailed knowledge of the preparation of a sketch to illustrate a simple mechanical, electrical or fluid system.

16. A general understanding the Principles of operation and terminology; bore, stroke, top dead centre (TDC), bottom dead centre (BDC), swept volume, clearance volume. Calculation of mechanical and thermal efficiency. Four-stroke operating cycle: efficiency, volumetric efficiency, piston displacement and compression ratio. Two-stroke operating cycle: piston displacement and compression ratio. Valve operating cycle: valve lead, valve lag and valve overlap. Layout and typical firing order of in-line, horizontally opposed, vee and radial piston engines.

17. A detailed knowledge of the engine construction: Top end; constructional features, function, classification and material composition of: cylinders, pistons, piston rings, piston or gudgeon pins, connecting rods, inlet and exhaust manifolds.

18. A detailed knowledge of the engine construction: Valves and valve operating mechanisms. Constructional features, function, classification and material composition of: rocker assemblies, push rods, cam followers, tappets, inlet and exhaust valves/seats/ guides/springs. Valve types: poppet, sleeve, rotary, disc and reed.

19. A detailed knowledge of the engine construction: Bottom end; constructional features, function. Classification and material composition of: crankshafts, cam shafts, cam rings, engine casings, sumps, and accessory/reduction gearboxes. Typical ball, roller and plain bearings.

20. A general understanding of the engine power; calculation of mechanical efficiency, thermal efficiency, volumetric efficiency, piston displacement and compression ratio from given information. Effect of incorrect valve timing on the above parameters. Measurement of piston displacement, compression ratio and manifold pressure.

21. A general knowledge of the engine power measurement; Determination/calculation of horsepower (HP) and/or kilowatt (KW); indicated horsepower (IHP); friction horsepower (FHP); brake horsepower (BHP); indicated mean effective pressure (IMEP); brake mean effective pressure (BMEP); friction mean effective pressure (FMEP). Plot of fuel consumption and engine power charts from given information.

22. A general understanding the Factors affecting engine power; Rich and lean mixture burn rates and effect upon engine. Symptoms and causes of: pre-ignition, detonation, after firing and backfiring. Calculation of brake-specific fuel consumption (BSFC) from given engine data. Definition of the terms: rich best power mixture; lean best power mixture; cruise power mixture.

23. A general knowledge of the classification of engine lubricants and fuels; properties and specific uses of mineral, ash-less dispersant, detergent and hypoid oils. Terms in relation to engine oil ratings: viscosity and viscosity index, flashpoint, pour point and cloud point. Classification methods of piston engine fuels (aviation gasoline). Terms in relation to piston engine fuels: octane rating, anti-knock additive (tetraethyl lead), performance number, volatility, specific gravity, and Reid vapour pressure test values. Grease: types, characteristics and uses.

24. A detailed knowledge of the magneto ignition system principles. Magneto principles. Terms: “E” gap, flux eddies, flux reversal, etc. Function of contact breaker and condenser/capacitor distributor. Primary and secondary systems.

25. A detailed knowledge of the Ignition systems; construction of polar inductor and rotating magnet magneto types. Effect on timing of magneto points gapping. Advanced and retarded ignition timing. Magneto switches, harnesses, screening and bonding. Construction and function of magneto compensating cam. Battery ignition systems. Auxiliary ignition systems, booster coil, induction vibrator and impulse coupling. Low and high tension systems. Safety precautions associated with ignition systems.

26. A detailed knowledge of the Spark plugs and ignition leads; constructional features and materials, temperature classification, reach, gapping and effect on spark plug performance. Diagnosis of engine condition by spark plug appearance. Ignition lead/harness construction, features and screening.

27. A general understanding of the float chamber carburetors; principles, features and construction. Configurations, up-draught and downdraught. Operation of: throttle valves, main and idle jets, power enrichment systems, float chambers, discharge nozzles, accelerator pumps, mixture control systems, and altitude control. Causes and effects of impact, throttle and fuel ice. Carburetor heating.

28. A detailed understanding of the pressure injection carburetors; principles, features and construction. Operation of air/fuel metering forces, mixture control system, fuel injection nozzles, electronic control, idle system, acceleration system and power enrichment system (manual/airflow).

29. A general knowledge of the lubrication systems; principles, features, operation and construction of wet and dry sump lubrication systems. Operation, features and construction of pressure pumps, scavenge pumps, oil coolers, oil cooler regulators, oil tank/hoppers, relief valves, check valves, oil filters, and oil dilution systems. Oil pressure regulation and indication.

30. A general knowledge of the induction, exhaust and cooling systems; construction and operation of typical engine induction/ intake and alternate air systems. Construction, features, material and operation of typical engine exhaust systems. Engine cooling: air and liquid, and cooling efficiency. Radiators, liquid jackets, pipes and connections. Coolant fluids: types, characteristics and hazards. Heat exchangers, fins, baffles, cowls, cowl flaps, gills, panels, and air seals.

31. A general knowledge of the Supercharging/Turbocharging; Principles and purpose of supercharging and its effects on charge density and temperature; brake horsepower (BHP); manifold absolute pressure (MAP); detonation; revolutions per minute (RPM); fuel consumption. Construction and operation of typical geared supercharger. Construction and function of impeller; diffuser; engine gear drives; turbine; intercooler. Understanding of the terms: rated altitude, critical altitude, overshoot, boot strapping, upper deck pressure, manifold pressure. System configurations: internal (supercharger), external (turbo supercharger), multi-stage and multi-speed. Differences between ground and altitude boosted engines. Function and construction of system control components: absolute pressure controller; variable absolute pressure controller; ratio controller; manifold pressure relief valve; waste gate assembly. Operation and function of system with ground adjusted waste gate valve and manifold pressure relief valve. Function, requirements and operation of lubrication system. Identification of supercharging faults involving low power, surging, low deck pressure, high deck pressure, low critical altitude, and low oil pressure. Lubrication system and protective devices. Control system adjustments.

32. A general knowledge of the rotary (Wankel) engine theory; analysis of Wankel (rotary) cycle. Rotor design and shape: rotor tip seals. Combustion chamber shape and sealing. Rotor shaft and epitrochoidal gear drive to output shaft. Unit construction, weight, power, and fuel consumption. Lubrication system. Carburetion and control system adjustments.

33. A general knowledge piston engine installation; safety precautions associated with the installation and removal of engines. Storage, preservation and inhibiting techniques required for piston engines. Engine bearers, anti-vibration mounts, and bearer mounting points. Hoses, pipes, feeders and connections from systems to engine. Control lines and cable lifting points. Inspection of engine bearers for serviceability and condition. Cowls, drains, electrical wiring, exhaust and inlets associated with engine installations.

34. A detailed knowledge on the piston engine operation, maintenance and ground running. Precautions and pre-start checks prior to ground running a piston engine. General precautions for starting, running and stopping a piston engine. Use of power charts and graphs to determine engine performance. Determination of piston engine defects from data obtained during an engine run. Maintenance procedures: removal, replacement and inspection of valve operating assemblies, cylinders, pistons, bearings and associated components. Top-end overhauls. Understanding of the use of maintenance data in Specification 100 or 2100 of the Air Transport Association (of America) (ATA).

35. A general knowledge of the propeller theory; Blade element theory. Effects on propeller thrust by high/low blade angle and reverse angle, angle of attack, pitch, and rotational speed. Understanding of propeller slip. Forces affecting rotating propeller blade: aerodynamic force, centrifugal force, torque and thrust. Effects in changes in the direction of relative airflow on blade angle of attack. Propeller configuration and type; propeller types: fixed pitch, ground adjustable, controllable pitch, and constant speeding.

36. A general knowledge of the propeller construction, assembly and installation; construction methods and specific materials used in composite, metal and wooden propellers. Typical mounting requirements for tapered and splinted propeller installations. Understanding of the terms: blade station, blade face, blade shank, blade back, blade shank, hub assembly. Pitch change mechanisms; operation and function of the following pitch change mechanisms: mechanical, hydraulic, aerodynamic, aerodynamic and hydraulic combination, and electrical. Function and operation synchronizer systems.

37. A detailed knowledge of the governors: Principles of operation and construction. Operation of typical governors. Effects of variation in spring pressure and engine RPM on governor operation. Single and double acting governors. Operation and function of speeder springs, pitch change stops, pilot valves, and fly weights. Understanding of the following conditions on speed: under speed, over speed, alpha, beta, feathering, un-feathering, reverse pitch.

38. A general knowledge of the damage and repair criteria; assessment of propeller blade damage. Erosion, corrosion, impact damage and delamination. Treatment/repair schemes for metal, wooden and composite blades

AIRCRAFT MAINTENANCE ENGINEERS – BASIC LICENCE EXAMINATION

SYLLABUS OF EXAMINATION FOR AIR NAVIGATION REGULATIONS

1. General knowledge of Certificates of Registration and Airworthiness issues, renewal, validation and classification of aircraft operations.

2. A detailed knowledge of ATA 100 specification.

3. A general knowledge of the Certificate of Maintenance – purpose validity and related details.

4. A general knowledge of the registration markings, documents to be carried in the international and domestic flights. Notices to be displayed in an aircraft.

5. A general understanding of International and State aviation laws. International Civil Aviation Organization (ICAO): formation, structure, functions, obligations and responsibilities. Review of ICAO Annexes (particularly Annex 1 — *Personnel Licensing*, Annex 6 — *Operation of Aircraft* and Annex 8 — *Airworthiness of Aircraft).* ICAO specifications applicable to the particular course of study. Government, ministerial and departmental responsibilities for civil aviation within the State. Formalities prescribed by the State: Certificates of Airworthiness (C of A), logbooks, Certificates of Maintenance, maintenance schedules, and Certificates of Approval. Format of documents, required signatures, conditions for issue of or compliance, and period of validity.

6. A general understanding of Airworthiness requirements; Design requirements: performance, structural strength, handling, aerodynamics, reliability, system or component performance and reliability, engine types and tests. Construction requirements: material quality, construction methods, approved manufacturing organizations (AMOs), systems of traceability to source of origin, and quality control/assurance. Test requirements: structural test programmes, including "safe life", "fail safe" and "damage tolerant" testing. Component testing and systems testing. Flight test schedules and engine test schedules. Test programmes for special cases (aircraft, systems and components). Procedures for the maintenance of continuing airworthiness. Airworthiness directives (AD): indigenous, foreign, issue dissemination, and action. Operational requirements: performance scheduling, flight and operations manuals. Maintenance requirements: use of aircraft maintenance manuals, maintenance schedules, overhaul periods/ lives, "on-condition" maintenance programmes and "condition monitoring" programmes. Responsibilities of licensed aircraft maintenance personnel working in an operator or an AMO. Aircraft and aircraft maintenance documentation.

7. A general knowledge of Air transport operations; Brief historical review of commercial aviation. Outline of major factors in airline organization and economics. Description of route network of Sri Lanka air space.

8. A general knowledge of Organization and management of the operator; Understanding of the air operator's responsibilities for maintenance and the relationship between the operator's MOE/Maintenance Control Manual and the maintenance organization's MME/Procedures Manual. General structure of an airline; functions and organization of various departments; organization of the maintenance department and AMOs; and detailed functions of departments such as Technical, Engineering, Production Engineering, Quality Control/ Assurance and Inspection. Documentation of maintenance: use of aircraft manuals, manufacturer's bulletins and ADs, preparation and approval of maintenance schedules, job/task cards, worksheets, aircraft/engine logbooks and operator's technical logbooks. Operation of inspection and/or quality departments. Stores organization and procedures. Planned maintenance work: inspection periods and component life, check cycles, rotation of components, and overhaul requirements. Hangar layout and equipment, and maintenance docks. Workshop safety, fire prevention and first aid. Responsibilities of departmental managers.

Management methods: methods study, time and motion study, statistical methods, budgeting and analysis. Group of persons nominated as being responsible for ensuring compliance with approval requirements. Establishment of the competence of personnel and training of persons signing maintenance release. Issue of terms of approval.

9. A general knowledge of the Operator economics related to maintenance. Component/powerplant leasing. Planning: analysis of different cyclic systems (progressive and equalized checks, etc.), long-term planning for mixed fleet, balancing work loading, effects of seasonal peaks on work loading, etc. Preparation of worksheets and job cards, task time analysis, and task sequencing for optimum down time. Development engineering: liaison with manufacturers; study of new aircraft types; performance analysis; modifications policy; defect analysis; engineering contributions to improved utilization; reliability programmes; engine trend monitoring and reliability centered maintenance studies. State regulations, incentives and discipline, and welfare. Quality control/assurance: inspection procedures, documents, records, and sampling techniques; psychological aspects of inspection, and duplicate inspections according to international, national and airline standards. Safety: national requirements for industrial safety, insurance requirements, hazards from hazardous fluids and gases (such as fuel, hydraulic fluid, vapours), mechanical dangers, and protective measures in work areas. Application of Safety Management System.

10. A general knowledge of the Aircraft maintenance licence requirements; Eligibility, age, limits of location, language and fees. Categories of licence as defined in State requirements. Knowledge and experience requirements. Training requirements. Examination requirements and content and issue of licence document. Privileges of the licence. Revocation and suspension procedures.

11. A general understanding of the Aircraft certification, documents and maintenance. *Aircraft, propeller and engine Type Certification;* Certification rules (e.g. FAR/EASA 21, 23, 25, 27 and 29). Type Certification (TC), TC issue, and associated TC Data Sheet. Supplemental Type Certification or major modification

Individual aircraft certification; Approval of design or production organizations. Issue of Certificate of Airworthiness (C of A) and Certificate of Registration (C of R). Documents to be carried on-board the aircraft: C of A, C of R, Noise Certificate, Weight and Balance Reports, and Radio Station Licence and Approval

Requirements for continuing airworthiness; Understanding of the concept that continuing airworthiness is the process of ensuring that at any time in its operating life, the aircraft should comply with airworthiness requirements and should be in a condition for safe operation. Renewal or continued validity of the C of A. State approval or acceptance of maintenance programmes, minimum equipment lists, ADs, manufacturer's service information (SBs, SLs, etc.), aircraft maintenance manual, operator maintenance control manual, and AMO Maintenance Procedures Manual. Understanding of the importance of defect reporting to the State of Registry and to the organization responsible for the type design. Analysis of defect accident or other maintenance or operational information by the organization responsible for the type design. Importance of structural integrity with particular reference to supplemental structural inspection programmes and any other requirements related to ageing aircraft.

Special operational approvals (e.g. Extended Range Operations by Aeroplanes by Twin-engined Aeroplanes (ETOPS), All Weather Operations, Reduced Vertical Separation Minima

(RVSM), Required Navigation Performance (RNP), and Minimum Navigation Performance Specifications (MNPS))

Appendix E

APPLICABLE TO CANDIDATES FROM SRI LANKA AIR FORCE APPLYING FOR AME-BL EXAMINATION

SYLLABUS FOR THE EXAMINATION PAPER ON CIVIL AIRCRAFT MAINTENANCE ORGANISATIONS, MAINTENANCE PROCEDURES AND PRACTICES.

1. Preparation of an initial maintenance Schedule or an Amendment thereof Approval of the Civil Aviation Authority

The applicant should have a basic knowledge of use of Maintenance Schedule

1.1 Preparation of Maintenance Tasks based on Maintenance Schedules, taking into consideration annual utilization, Hour basis, cycle basis and calendar basis. Adoption of operating experiences.

1.2 Requirement of duplicate inspection in respect of any dismantled, adjusted, repaired or renewed, part of system, which has been disturbed. The free movement, range direction and tension checks shall be certified in accordance with the DGCA requirements

1.3 Inspection standards applied to individual task inspections.

1.4 Knowledge of Condition Monitored Maintenance / Reliability Programme. Methods of Data Collection, analysis, corrective action and reporting.

2. Maintenance Programme Compliance Document Procedures (EASA PART M, AMC)

The applicant should have knowledge in :

2.1 General requirements

2.2 Programme basis.

2.3 Amendments.

2.4 Permitted variations to maintenance periods.

2.5 Periodic review of maintenance programme.

2.6 Reliability programme.

2.7 DGCA required items.

3. EASA Part M and AMC Including GM (Guidance Material)

The applicant should have knowledge in:

3.1 Terminology

3.2 Application for and approval of the operator's maintenance system

3.3 Maintenance Responsibility

3.4 Maintenance Management

3.5 Quality System

3.6 Operator's Maintenance Management Exposition

3.7 Operator's aeroplane maintenance programme

3.8 Operator's Aeroplane Technical Log

3.9 Maintenance Records.

3.10 Continued validity of the Air Operator Certificate in respect of the Maintenance System.

4. Maintenance and Inspection of crew harnesses and passenger seat belts (Metal to Metal attachment)

The applicant should have knowledge in:

4.1 Safety belt specification, its material, minimum thickness, resistance acceleration forces

4.2 The strength requirement of a seat belt. Method of testing the strength of the belt. Testing for ultimate load

4.3 Belt locking features, Belt extension. Adjustment of fastening buckle

5. Maintenance of Civil Aircraft

The applicant should have knowledge of requirements for

5.1 Maintenance of aircraft, engines, propellers and equipment

5.2 Use of subsequent maintenance recommendations, including contents promulgated in ADs, SBs, Service Letters, Maintenance Manual and other regulatory material.

5.3 Knowledge of pre-flight, Daily/Stay over inspection procedures Tyre Maintenance, Avionics Installation.

5.4 Permitted variations to maintenance periods
Items controlled by flight hours, calendar time, landing / cycle items controlled by more than one limit

5.5 Knowledge of Emergency Equipment carried on aircraft

6. Additional Requirements

The applicant should have knowledge in :

6.1 Standard Maintenance Practices.

6.2 Emergency Equipment

6.3 Emergency Escape Provisions

6.4 Fuel / Oil Contamination Check

6.5 Pressure Vessels

6.6 Maintenance applicable to specific Aeroplane Operations, CAT II / CAT III, RVSM, ETOPS,BRNAV.

6.7 Additional Maintenance Requirements

6.8 Modifications to Aircraft and Equipments

6.9 Customer furnished Equipment