CAR 66 BASIC TRAINING SYLLABUS FOR AME COURSE

The applicable modules for category B1.1 (Mechanical) and B2 (Avionics) are marked as 'X'.

Module No.	Category B1.1	Category B2
3	X	X
4	X	X
5	X	X
6	X	X
7A	X	X
8	X	X
9A	X	X
10	X	X
11A	X	N/A
13	N/A	X
14	N/A	X
15	X	N/A
17A	X	N/A
Total No. of modules	**11**	**10**

Note: Basic knowledge for categories B1.1 and B2 are indicated by the knowledge levels (1, 2 or 3) against each applicable subject.

Level 1 is Familiarization with the principal elements of the subject.
Level 2 is a general knowledge of the theoretical and practical aspects of the subject and an ability to apply that knowledge.
Level 3 is a detailed knowledge of the theoretical and practical aspects of the subject and a capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.

MODULE 3 ELECTRICAL FUNDAMENTALS

	B1.1	B2
3.1 Electron Theory Structure and distribution of electrical charges within: atoms, molecules, ions, compounds; Molecular structure of conductors, semiconductors and insulators.	1	1
3.2 Static Electricity and Conduction Static electricity and distribution of electrostatic charges; Electrostatic laws of attraction and repulsion; Units of charge, Coulomb's Law; Conduction of electricity in solids, liquids, gases and vacuum.	2	2
3.3 Electrical Terminology The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.	2	2
3.4 Generation of Electricity Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion.	1	1
3.5 DC Sources of Electricity Construction and basic chemical action of: primary cells, secondary cells, lead acid cells, nickel cadmium cells, other alkaline cells; Cells connected in series and parallel; Internal resistance and its effect on a battery; Construction, materials and operation of thermocouples; Operation of photo-cells.	2	2
3.6 DC Circuits Ohms Law, Kirchhoff's Voltage and Current Laws; Calculations using the above laws to find resistance, voltage and current; Significance of the internal resistance of a supply.	2	2
3.7 Resistance/Resistor (a) Resistance and affecting factors; Specific resistance; Resistor colour code, values and tolerances, preferred values, wattage ratings Resistors in series and parallel; Calculation of total resistance using series, parallel and series parallel combinations; Operation and use of potentiometers and rheostats; Operation of Wheatstone Bridge	2	2
(b) Positive and negative temperature coefficient conductance; Fixed resistors, stability, tolerance and limitations, methods of construction; Variable resistors, thermistors, voltage dependent resistors; Construction of potentiometers and rheostats; Construction of Wheatstone Bridge;	1	1
3.8 Power Power, work and energy (kinetic and potential); Dissipation of power by a resistor; Power formula; Calculations involving power, work and energy.	2	2
3.9 Capacitance/Capacitor Operation and function of a capacitor; Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating; Capacitor types, construction and function; Capacitor colour coding; Calculations of capacitance and voltage in series and parallel circuits; Exponential charge and discharge of a capacitor, time constants; Testing of capacitors.	2	2

3.10 Magnetism (a) Theory of magnetism; Properties of a magnet, Action of a magnet suspended in the Earth's magnetic field; Magnetization and demagnetization; Magnetic shielding; Various types of magnetic material; Electromagnets construction and principles of operation; Hand clasp rules to determine: magnetic field around current carrying conductor.	2	2
(b) Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; Precautions for care and storage of magnets.	2	2
3.11 Inductance/Inductor Faraday's Law; Action of inducing voltage in a conductor moving in a magnetic field; Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns; Mutual induction; The effect the rate of change of primary current and mutual inductance has on induced voltage; Factors affecting mutual inductance: number of turns in coil, physical size of coil, permeability of coil, position of coils with respect to each other; Lenz's Law and polarity determining rules; Back emf, self-induction; Saturation point; uses of inductors	2	2
3.12 DC Motor/Generator Theory Basic motor and generator theory; Construction and purpose of components in DC generator; Operation of, and factors affecting output and direction of current flow in DC generators; Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors; Series wound, shunt wound and compound motors; Starter Generator construction.	2	2
3.13 AC Theory Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current and power Triangular/Square waves; Single/3 phase principles.	2	2
3.14 Resistive (R), Capacitive (C) and Inductive (L) Circuits Phase relationship of voltage and current in L, C and R circuits, parallel, series and series parallel; Power dissipation in L, C and R circuits; Impedance, phase angle, power factor and current calculations; True power, apparent power and reactive power calculations.	2	2
3.15 Transformers Transformer construction principles and operation; Transformer losses and methods for overcoming them; Transformer action under load and no-load conditions; Power transfer, efficiency, polarity markings; Calculation of line and phase voltages and currents; Calculation of power in a three phase system; Primary and Secondary current, voltage, turns ratio, power, efficiency; Auto transformers.	2	2
3.16 Filters: Operation, application and uses of the following filters: low pass, high pass, band pass, band stop.	1	1
3.17 AC Generators: Rotation of loop in a magnetic field and waveform produced; Operation and construction of revolving armature and revolving field type AC generators; Single phase, two phase and three phase alternators; Three phase star and delta connections advantages and uses; Permanent Magnet Generators.	2	2
3.18 AC Motors: Construction, principles of operation and characteristics of: AC synchronous and induction motors both single and polyphase; Methods of speed control and direction of rotation; Methods of producing a rotating field: capacitor, inductor, shaded or split pole.	2	2

MODULE 4. ELECTRONIC FUNDAMENTALS

	B1.1	B2
4.1 Semiconductors 4.1.1 *Diodes* (a) Description and characteristics Diode symbols; Diode characteristics and properties; Diodes in series and in parallel; Materials, electron configuration, electrical properties; P and N type materials: effects of impurities on conduction, majority and minority characters; P-N junction in a semiconductor, development of a potential across a PN junction in unbiased, forward-biased and reverse-biased conditions; Diode parameters: peak inverse voltage, maximum forward current. Temperature, frequency, leakage current, power dissipation; Main characteristics and use of silicon-controlled rectifiers (thyristors), light- emitting diodes (LEDs), photo-conductive diodes, rectifier diodes.	2	2
(b) Operation and function Operation and function of diodes in the following circuits: clippers, dampers, full- and half-wave rectifiers, bridge rectifiers, voltage doublers and triplers; Detailed operation and characteristics of the following devices: silicon controlled rectifier (thyristor), light-emitting diode (LED), Schottky diode, photo-conductive diode, varactor diode, varistor, rectifier diodes, Zener diode. Functional testing of diodes.	-	2
4.1.2 Transistors (a) Description and characteristics Transistor symbols; Component description and orientation; Transistor characteristics and properties.	1	2
(b) Construction and operation Construction and operation of PNP and NPN transistors; Base, collector and emitter configurations; Testing of transistors; Basic appreciation of other transistor types, including types of FET and their uses; Application of transistors: amplifier classes (A, B, C); Simple circuits including bias, decoupling, feedback and stabilization; Multistage circuit principles: cascades, push pull, oscillators, multi vibrators, flip-flop circuits; Operation and amplifier stages connecting methods: resistive, capacitive, direct, inverting, non-inverting and adding	-	2
4.1.3 Integrated Circuits (a) Description and operation of logic circuits and linear circuits/operational amplifiers.	1	2
(b) Introduction to the operation and function of an operational amplifier used as: an integrator, a differentiator, a voltage follower, a comparator; Advantages and disadvantages of positive and negative feedback.	-	2
4.2 Printed Circuit Boards Description and use of printed circuit boards.	1	2
4.3 Servomechanisms (a) Principles Understanding of the following principles: open- and closed-loop systems, servomechanism, feedback, follow-up, null, overshoot. damping, dead band, hunting, proximity switches, analogue transducers, synchro systems and components, digital tachometers and encoders, Inductance, and capacitance transmitters;	1	2
(b) Construction operation and use of the following synchro-system components: resolvers, differential, control and torque, E and I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters; Construction, operation and use of servomechanism and PID controller; Fault- finding of servo defects, reversal of synchro leads, hunting.	-	2

MODULE 5. DIGITAL TECHNIQUES ELECTRONIC INSTRUMENT SYSTEMS

	B1.1	B2
5.1 Electronic Instrument Systems Typical systems arrangements and cockpit layout of electronic instrument Systems	1	1
5.2 Numbering Systems Numbering systems: binary, octal and hexadecimal; Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa.	1	2
5.3 Data Conversion Analogue Data, Digital Data; Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types	1	2
5.4 Data Buses Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications. Aircraft network/Ethernet.	2	2
5.5 Logic Circuits (a) Identification of common logic gate symbols, tables and equivalent circuits; Applications used for aircraft systems, schematic diagrams. (b)Interpretation of logic diagrams.	2 -	2 2
5.6 Basic Computer Structure (a) Computer terminology (including bit, byte, software, hardware, CPU, IC, and various memory devices such as RAM, ROM, PROM); Computer technology (as applied in aircraft systems).	2	2
(b) Computer operation, layout, and interface of the major components In a microcomputer, Including their associated bus systems; Information contained in single- and multi-address instruction words; Memory-associated terms; Operation of typical memory devices; Operation. Advantages, and disadvantages of the various data storage systems.	-	2
5.7 Microprocessors Functions performed and overall operation of a microprocessor; Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit.	-	2
5.8 Integrated Circuits Operation and use of encoders and decoders Function of encoder types.	-	2
5.9 Multiplexing Operation, application and identification in logic diagrams of multiplexers and demultiplexers	-	2
5.10 Fibre Optics Advantages and disadvantages of fibre optic data transmission over electrical wire propagation; Fibre optic data bus; Fibre optic related terms; Terminations; Couplers, control terminals, remote terminals; Application of fibre optics in aircraft systems.	1	2
5.11 Electronic Displays Principles of operation of common types of displays used in modern aircraft, including Cathode Ray Tubes, Light Emitting Diodes and Liquid Crystal Display (LCDs).	2	2
5.12 Electrostatic Sensitive Devices Special handling of components sensitive to electrostatic discharges; Awareness of risks and possible damage, component and personnel anti-static protection devices.	2	2
5.13 Software Management Control Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programmes	2	2
5.14 Electromagnetic Environment Influence of the following phenomena on maintenance practices for electronic system:	2	2

EMC-Electromagnetic Compatibility EMI-Electromagnetic Interference HIRF-High Intensity Radiated Field Lightning/ lightning protection		
5.15 Typical Electronic/Digital Aircraft Systems General arrangement of typical electronic/ digital aircraft systems and associated BITE(Built In Test Equipment) testing such as: (a) ACARS-ARINC Communication and Addressing and Reporting System, FBW-Fly by Wire FMS-Flight Management System, IRS-Inertial reference system (b) ECAM - electronic centralised aircraft monitoring, EICAS - engine indication and crew alerting system, EFIS - electronic flight instrument system, GNSS - global navigation satellite system. TCAS - traffic alert collision avoidance system, Integrated Modular Avionics, Cabin Systems, Information Systems.	1	1

MODULE 6. MATERIALS AND HARDWARE

	B1.1	B2
6.1 Aircraft Materials — Ferrous (a) Characteristics, properties and identification of common alloy steels used in aircraft; Heat treatment and application of alloy steels;	2	1
(b) Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.	1	1
(c) Repair and inspection procedures for ferrous materials, structures, and airframes.	2	1
6.2 Aircraft Materials — Non-Ferrous (a) Characteristics, properties and identification of common non-ferrous materials used in aircraft; Heat treatment and application of non-ferrous materials;	2	1
(b) Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.	1	1
(c)Repair and inspection procedures for non-ferrous materials, structures, and airframes	2	1
6.3 Aircraft Materials - Composite and Non- Metallic 6.3.1 Composite and non-metallic other than wood and fabric (a)Characteristics, properties and identification of common composite and nonmetallic materials, other than wood, used in aircraft; Sealant and bonding agents.	2	2
(b) Detection of defects/deterioration in composite and non-metallic material. Repair of composite and non-metallic material.	2	-
(c) Repair of and inspection procedures for composite and nonmetallic materials, structures, and airframes.	2	1
6.3.2 Wooden structures Construction methods of wooden airframe structures; Characteristics, properties and types of wood and glue used in aero planes; Preservation and maintenance of wooden structure; Types of defects in wood material and wooden structures; The detection of defects in wooden structure; Repair of wooden structure.	1	-
6.3.3 Fabric covering Characteristics, properties and types of fabrics used in aero planes; Inspections methods for fabric; Types of defects in fabric; Repair of fabric covering.	1	-
6.4 Corrosion (a) Chemical fundamentals; Formation by, galvanic action process, microbiological contamination, mechanical stress.	1	1
b)Types of corrosion and their identification; Causes of corrosion; Material types, susceptibility to corrosion	3	2
6.5 Fasteners 6.5.1 Screw threads Screw nomenclature; Thread forms, dimensions and tolerances for standard threads used in aircraft; Measuring screw threads;	2	2
6.5.2 Bolts, studs and screws Bolt types: specification, identification and marking of aircraft bolts, international standards; Nuts: self-locking, anchor, standard types; Machine screws: aircraft specifications; Studs: types and uses, insertion and removal; Self tapping screws, dowels.	2	2
6.5.3 Locking devices Tab and spring washers, locking plates, split pins, palnuts, wire locking, quick release fasteners, keys, circlips, cotter pins.	2	2
6.5.4 Aircraft rivets Types of solid and blind rivets: specifications and identification, heat treatment.	2	1

6.6 Pipes and Unions (a) Identification of, and types of rigid and flexible pipes and their connectors used in aircraft;	2	2
(b) Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes	2	1
6.7 Springs Types of springs, materials, characteristics and applications.	2	1
6.8 Bearings Purpose of bearings, loads, material, construction; Types of bearings and their application	2	2
6.9 Transmissions Gear types and their application; Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns; Belts and pulleys, chains and sprockets.	2	2
6.10 Control Cables Types of cables; End fittings, turnbuckles and compensation devices; Pulleys and cable system components; Bowden cables; Aircraft flexible control systems	2	1
6.11 Electrical Cables and Connectors Cable types, construction and characteristics; High tension and co-axial cables; Crimping; Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes.	2	2

MODULE 7 MAINTENANCE PRACTICES	B1.1	B2
7.1 Safety Precautions-Aircraft and Workshop Aspects of safe working practices including precautions to be taken when working with electricity, gases (especially oxygen), oils, and chemicals. Fuel tank safety and fuel tank entry procedures and precautions. Awareness and precautions regarding aircraft equipped with ballistic recovery systems. Also, instructions for the remedial action to be taken in the event of a fire or another accident with one or more of these hazards, including information on fire-extinguishing agents.	3	3
7.2 Workshop Practices Care of tools, control of tools, use of workshop materials; Dimensions, allowances and tolerances, workmanship standards; Calibration of tools and equipment, calibration standards	3	3
7.3 Tools Common hand tool types; Common power tool types; Operation and use of precision measuring tools; Lubrication equipment and methods. Operation, function and use of electrical general test equipment	3	3
7.4 (Reserved)		
7.5 Engineering Drawings, Diagrams and Standards Drawing types and diagrams, their symbols, dimensions, tolerances and projections; Identifying title block information Microfilm, microfiche and computerised presentations; Specification 100 of the Air Transport Association (ATA) of America; Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL; Wiring diagrams and schematic diagrams.	2	2
7.6 Fits and Clearances Drill sizes for bolt holes, classes of fits; Common system of fits and clearances; Schedule of fits and clearances for aircraft and engines; Limits for bow, twist and wear; Standard methods for checking shafts, bearings and other parts.	2	1
7.7 Electrical Wiring Interconnection System (EWIS) Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated; Testing of crimp joints; Connector pin removal and insertion; Co-axial cables: testing and installation precautions; Identification of wire types, their inspection criteria and damage tolerance. Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding. High-Intensity Radiated Fields (HIRF) and protection principles; Soldering of electrical wires, EWIS installations, inspection, repair, maintenance, and cleanliness standards.	3	3
7.8 Riveting Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints	2	-
7.9 Pipes and Hoses Bending and belling/ flaring aircraft pipes; Inspection and testing of aircraft pipes and hoses; Installation and clamping of pipes	2	-
7.10 Springs Inspection and testing of springs	2	-
7.11 Bearings Testing, cleaning and inspection of bearings; Lubrication requirements of bearings; Defects in bearings and their causes.	2	-
7.12 Transmissions Inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.	2	-

7.13 Control Cables Swaging of end fittings; Inspection and testing of control cables; Bowden cables; aircraft flexible control systems	2	-
7.14 Material handling 7.14.1 Sheet Metal Marking out and calculation of bend allowance; Sheet metal working, including bending and forming; Inspection of sheet metal work.	2	-
7.14.2 Composite and non-metallic Bonding practices; Environmental conditions Inspection methods	2	-
7.14.3 Additive Manufacturing Common additive manufacturing techniques and their influence on the mechanical properties of the finished part; Inspection of additive manufactured parts and common production failures.	1	1
7.15 (Reserved)		
7.16 Aircraft Weight and Balance (a) Calculation of centre of Gravity/ Balance limits: use of relevant documents;	2	2
(b) Preparation of aircraft for weighing - Aircraft weighing;	2	--
7.17 Aircraft Handling and Storage Aircraft taxiing/ towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions; Aircraft storage methods.	2	2
7.18 Disassembly, Inspection, Repair and Assembly Techniques (a) Types of defects and visual inspection techniques. Corrosion removal, assessment and re-protection.	3	3
(b) General repair methods, Structural Repair Manual; Ageing, fatigue and corrosion control programmes;	2	-
(c) Nondestructive inspection techniques including, penetrant, radiographic, eddy current, magnetic particle, ultrasonic and borescope inspections; including practical training in colour contrast penetrant inspection;	2	1
(d) Disassembly and re-assembly techniques.	2	2
(e) Trouble shooting techniques	2	2
7.19 Abnormal Events (a) Inspections following lightning strikes and HIRF penetration.	2	2
(b) Inspections following abnormal events such as heavy landings and flight through turbulence.	2	-
7.20 Maintenance Procedures Maintenance planning; Modification procedures; Stores procedures; Certification/release procedures; Interface with aircraft operation; Maintenance Inspection/Quality Control/Quality Assurance; Additional maintenance procedures. Control of life limited components	2	2
7.21 Documentation and communication Documentation: elements and criteria for writing work reports, troubleshooting reports, and shift handover instructions. Communication: clear, comprehensive, and concise.	2	2

MODULE 8. BASIC AERODYNAMICS

	B1.1	B2
8.1 Physics of the Atmosphere International Standard Atmosphere (ISA), application to aerodynamics.	2	2
8.2 Aerodynamics Airflow around a body; Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, upwash and downwash, vortices, stagnation; The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash in and wash out, fineness ratio, wing shape and aspect ratio; Thrust, Weight, Aerodynamic Resultant; Generation of Lift and Drag: Angle of Attack, Lift coefficient, Drag coefficient, polar curve, stall; Aerofoil contamination including ice, snow, frost.	2	2
8.3 Theory of Flight Relationship between lift, weight, thrust and drag; Glide ratio; Steady state flights, performance; Theory of the turn; Influence of load factor: stall, flight envelope and structural limitations; Lift augmentation.	2	2
8.4 High-speed airflow Speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, critical Mach number, compressibility buffet, shock wave, aerodynamic heating, area rule; Factors that affect airflow In engine Intakes of high-speed aircraft; Effects of sweepback on critical Mach number.	2	2
8.5 Flight Stability and Dynamics Longitudinal, lateral and directional stability (active and passive).	2	2

MODULE 9 HUMAN FACTORS

	B1.1	B2
9.1 General The need to take human factors into account; when performing maintenance Incidents attributable to human factors/human error; 'Murphy's' law.	2	2
9.2 Human Performance and Limitations Vision; Hearing; Information processing; Attention and perception; Memory; Claustrophobia and physical access.	2	2
9.3 Social Psychology Accountability and responsibility: individual and group; Motivation and de-motivation; Peer pressure; 'Culture' issues; Team working; Management, supervision and leadership	1	1
9.4 Factors that affect performance Fitness/health; Stress: domestic and work related; Time pressure and deadlines; Workload: overload, underload, and workload management; Sleep and fatigue, shift work; Alcohol, medication, drug abuse; Lack of manpower.	2	2
9.5 Physical Environment Noise and fumes; Illumination; Climate and temperature; Motion and vibration; working environment, Situational awareness.	1	1
9.6 Tasks Physical work; Repetitive tasks, complacency; Visual inspection; Complex systems; Critical maintenance tasks and error-capturing methods; Technical documentation: access, use, and quality.	1	1
9.7 Communication Within and between teams; Work logging and recording; Shift handover; Keeping up to date, currency; Dissemination of information	2	2
9.8 Human Error Error models and theories; Types of error in maintenance tasks; Implications of errors (i.e accidents) Organizational errors; Avoiding and managing errors	2	2
9.9 Safety Management Risk management; Occurrence reporting; Safety culture Just culture; Identifying, avoiding, and reporting hazards; organizational human-factors programme: professionalism and integrity, error provoking behaviour, reporting errors, disciplinary policy, error investigation, action to address problems, feedback, assertiveness; Dealing with emergencies.	2	2
9.10 The 'Dirty Dozen' and the risk-mitigation The 'Dirty Dozen' : The twelve most common human -factors errors in maintenance: Lack of communication, Lack of teamwork. Lack of assertiveness, Complacency, Fatigue, Stress, Lack of knowledge, Lack of resources, Lack of awareness, Distraction, Pressure, Norms. Risk-mitigation methods.	2	2

MODULE 10. AVIATION LEGISLATION

	B1.1	B2
10.1 Regulatory framework Role of: - International Civil Aviation Organization (ICAO); - Directorate General of Civil Aviation (DGCA), India; - The Aircraft Act and Rules made thereunder relating to airworthiness; - CAR-21, CAR-M, CAR-145, CAR-66, CAR 147, CAR ML, CAR· CAMO, CAR·CAO - the relationship between regulations and AMC. GM, AAC etc. - occurrence reporting according to CAR Section 2 Series C Part I, CAR M, CAR ML, CAR-145 and CAR-CAO; - Aeronautical Information Circulars (Applicable to Aircraft Maintenance and Release); - the relationship between Initial and Continuing Airworthiness (such as CAR 21, CAR M, CAR-145, CAR-66, CAR-147, CAR-ML, CAR-CAMO, and CAR-CAO) and regulations related to the Air Operations and regulation related to the Air Crew	1	1
10.2 CAR-66 Certifying Staff – Maintenance General understanding ofCAR-66 maintenance licences with the associated privileges and authorisations, and how to exercise them properly for the different aircraft categories.	2	2
10.3 CAR-145 — Approved Maintenance Organizations Detailed understandingofCAR-145 and CAR-CAO	2	2
10.4 Independent certifying staff Privileges, responsibilities, record-keeping, limitations, and oversight according to CAR-M, CAR -66 and CAR-ML.	3	3
10.5 Air operations General understanding of regulation relating to air operations; Differences between commercial and non-commercial air operations, and their influence on aircraft maintenance; Air Operator Certificates (AOCs)/Air Operator Permits (AOP) Air operator responsibilities, in particular regarding continuing airworthiness and maintenance; Specialized operations/ specific approvals: ETOPS, CAT I/II/III, and BRNAV. Minimum Equipment List (MEL) and Configuration Deviation List (CDL); Aircraft placarding and markings; Documents to be carried on board: Certificate of Airworthiness / Restricted Certificate of Airworthiness; Airworthiness Review Certificate; Permit to Ry; Certificate of Registration; Noise Certificate; Weight and Balance report; Radio Station Licence.	1	1
10.6 Certification of aircraft, parts, and appliances Basic understanding of CAR 21	2	2
10.7 Continuing Airworthiness General understanding of the CAR 21 requirements on continuing airworthiness; General understanding of CAR-M, CAR-ML and CAR-CAMO; Aircraft Maintenance Programme.	2	2
10.8 Oversight principles in continuing airworthiness	1	1
10.9 Reserved		
10.10 Cybersecurity in aviation maintenance Regulation on the introduction of organization requirements for the management of information security risks related to aeronautical information systems used in civil aviation.	1	1

MODULE11. TURBINE AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

	B1.1	B2
11.1 Theory of flight (a) Aeroplane aerodynamics and flight controls Operation and effect of: roll control: ailerons and spoilers; pitch control: elevators, stabilators, variable incidence stabilisers and canards; yaw control, rudder limiters; elevons, ruddervators; high-lift devices, slots, slats, flaps, flaperons; drag-inducing devices, spoilers, lift dumpers, speed brakes; trim tabs, servo tabs, control surface bias.	2	-
(b) Aeroplane: other aerodynamic devices Operation and effect of: balance and anti-balance (leading) tabs; spring tabs, mass balance, aerodynamic balance panels; mass balance, aerodynamic balance panels; effects of wing fences, saw tooth leading edges; boundary layer control using vortex generators, stall wedges or leading-edge devices.	2	-
11.2 Airframe Structures (ATA 51) (a) General concepts: Zonal and station identification systems; Electrical bonding; Lightning strike protection provisions.	2	-
(b) Airworthiness requirements for structural strength: Structural classification: primary, secondary, and tertiary; Fail-safe, safe-life, damage-tolerance concepts; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains and ventilation provisions; System installation provisions.	2	-
(c) Construction methods Stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, skinning, anticorrosive protection, wing, empennage and engine attachments; Structure assembly techniques: riveting, bolting. Bonding; Methods of surface protection, such as chromating. Anodizing, painting; Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks.		
11.3 Airframe Structures — Aeroplanes 11.3.1 Fuselage, doors, windows (ATA S2/S3/S6) (a) Construction principles Construction and pressurization sealing; Wing, stabilizer, pylon, and undercarriage attachments; Seat installation and cargo loading system; Doors and emergency exits: construction, mechanisms, operation and safety devices; Windows and windscreen construction and mechanisms.	2	-
(b) Airborne towing devices {glider, banner, target)	1	
(c) Doors Doors and emergency exits: safety devices; Cargo loading system.	2	
11.3.2 Wings (ATA 57) Construction; Fuel storage; Landing gear, pylon, control surface and high lift/drag attachments.	2	-
11.3.3 Stabilisers (ATA 55) Construction; Control surface attachment	2	-
11.3.4 Flight Control Surfaces (ATA 55/57) Construction and attachment; Balancing — mass and aerodynamic.	2	-
11.3.5 Nacelles/ Pylons (ATA 54) Construction; Firewalls; Engine mounts.	2	-

11.4 Air Conditioning and Cabin Pressurization (ATA 21) (a) Pressurisation Pressurisation systems; Cabin pressure controllers, control, and safety valves; Control and indication.	3	-
(b) Air supply Sources of air supply including engine bleed, APU and ground cart; Distribution systems.	3	-
(c) Air conditioning Air-conditioning systems; Air cycle and vapour cycle machines; Flow, temperature and humidity control system; Control and indication control valves.	3	-
(d) Safety and warning devices Protection and warning devices.	3	-
11.5 Instruments/Avionic Systems 11.5.1 Instrument Systems (ATA 31) Pitot static: altimeter, air speed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading; Angle of attack indication, stall warning systems; Glass Cockpit. Other aircraft system indication.	2	-
11.5.2 Avionic Systems Fundamentals of system layouts and operation of: Auto flight (ATA 22); Communication systems (ATA23): Very High Frequency (VHF] communications, High Frequency (HF] communications, Satellite Communications (SATCOM), Controller- pilot data link communications (CPDLC), Audio systems, Emergency Locator Transmitters (ELTs), Cockpit Voice Recorder (CVR); Navigation systems (ATA 34): Very high frequency omnidirectional range (VOR), Automatic direction finder (ADF), Instrument landing system (ILS), Microwave landing system (MLS), Flight director systems {FDSs), distance-measuring equipment (DME),Area navigation (RNA V) systems, Flight management systems (FMSs), Satellite navigation systems, Air traffic control transponder, secondary surveillance radar, Traffic alert and collision avoidance system (TCAS), Weather avoidance radar, Radio altimeter, Inertial navigation system (INS), ARINC (Aeronautical Radio Incorporated) communication and reporting. Types and uses of avionics general test equipment.	1	-
11.6 Electrical Power(ATA 24) Batteries Installation and Operation; DC power generation; AC power generation; Emergency power generation; Voltage regulation; Power distribution; Inverters, transformers, rectifiers; Circuit protection. External/ Ground power	3	-
11.7 Equipment and Furnishings (ATA 25) (a) Emergency equipment requirements. Emergency equipment requirements.	2	-
(b)Cabin and cargo layout Seats, harnesses, and belts; Cabin layout; Equipment layout; Cabin furnishing installation; Galley installation; Cargo handling and retention equipment; Air stairs.	1	-
11.8 Fire Protection (ATA 26) (a) Fire and smoke detection system, and fire extinguishing systems: Fire and smoke detection and warning systems; Fire-extinguishing systems; System tests.	1	-
(b) Portable fire extinguisher	1	-
11.9 Flight Controls (ATA 27) (a) Primary and secondary flight controls: Primary controls: aileron, elevator, rudder, spoiler; Trim control trim tabs; High-lift devices; System operation: manual; Gust locks and gust lock systems; Artificial feel, yaw damper, Mach trim, rudder	3	-

limiter; Stall-warning systems.		
(b) Actuation and protection: Active load control; Lift dump, speed brakes; Hydraulic, pneumatic systems; Stall-protection systems.	3	-
(c) System operation: Electrical systems, fly-by-wire systems.	3	-
(d) Balancing and rigging.	3	-
11.10 Fuel Systems (ATA 28) (a) Systems: System layout; Fuel tanks; Supply systems.	3	-
(b) Fuel handling: Cross-feed and transfer; Refuelling and defuelling.	3	-
(c) Indication and warnings.	3	-
(d) Special systems: Dumping, venting, and draining; Inert gas systems.	3	-
(e) Balancing: Longitudinal balance fuel systems.	3	-
11.11 Hydraulic Power (ATA 29) (a) System description: System layout; Hydraulic fluids; Hydraulic reservoirs and accumulators; Filters; Power distribution.	3	-
(b) System operation (1): Pressure generation: electric and mechanical; Pressure control; Indication and warning systems; Servicing.	3	-
(c) System operation (2): Pressure generation: pneumatic; Emergency pressure generation; Interface with other systems.	3	-
11.12 Ice and rain protection (ATA 30) (a) Principles: Ice formation. Classification and detection.	3	-
(b) De-icing: De-icing systems: electrical, hot-air, pneumatic, chemical; Probe and drain heating.	3	-
(c) Anti-icing: Anti-icing systems: electrical, hot-air, chemical.	3	-
(d) Wipers: Wiper systems.	3	-
(e) Rain-repellent systems.	3	-
11.13 Landing Gear (ATA 32) (a) Description: Construction, shock absorbing; Tyres.	3	-
(b) Systems: Extension and retraction systems: normal and emergency; Indications and warnings; Wheels, brakes, antiskid, and auto-braking; Steering.	3	-
(c) Air - ground sensing.	3	-
(d) Tail protection: Skids	3	-
11.14 Lights (ATA 33) External: navigation, anti-collision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	3	-
11.15 Oxygen (ATA 35) System lay-out: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings;	3	-
11.16 Pneumatic/Vacuum (ATA 36) (a) System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.	3	-
(b) Pumps: Pressure and vacuum pumps.	3	-
11.17 Water/Waste (ATA 38) (a) Systems: Water system lay-out, supply, distribution, servicing and draining; Toilet system lay-out, flushing and servicing;	3	-
(b) Corrosion: Corrosion aspects	3	-

11.18 On Board Maintenance Systems (ATA 45) Central Maintenance computers; Data-loading system; Electronic library system; Printing systems; Structure monitoring (damage-tolerance monitoring). Bleed management, air pressure control, air ventilation and control, avionics and cockpit ventilation control, temperature control, air traffic communication, avionics communication router, electrical load management, circuit breaker monitoring, electrical system BITE, fuel management, braking control, steering control, landing gear extension and retraction, tyre pressure indication, oleo pressure indication, brake temperature monitoring. etc.	2	-
(b) Typical system layout.	2	-
11.20 Cabin Systems (ATA44) System architecture, operation, and control of systems for: passenger in-flight entertainment; communication within the aircraft (Cabin Intercommunication data system (CIDS); communication between the aircraft cabin and ground stations; including voice, data, music, and video transmission CIDS interface between cockpit/cabin crew and cabin systems. Data exchange between the different related line replaceable units (LRUs). Flight attendant panels (FAPs). Cabin network server (CNS) and interfaces with the following systems: Data/radio communication; Cabin core system (CCS); In-flight entertainment system (IFES); External communication system (ECS); Cabin mass memory system (CMMS); Cabin monitoring system (CMS); Miscellaneous cabin systems (MCSs); and Other systems. Cabin network server (CNS) hosting functions: Access to pre departure/ departure reports; Email/intranet/internet access; passenger database; In-flight entertainment system; External communication system; Cabin mass memory system; Cabin monitoring system; Miscellaneous cabin system.	2	-
11.21 Information Systems (ATA46) System architecture, operation, and control of: Storage and electronic library; - Updating;	2	-

MODULE 13. AIRCRAFT AERODYNAMICS, STRUCTURES AND SYSTEMS

	B1.1	B2
13.1 Theory of Flight (a) Aeroplane Aerodynamics and Flight Controls Operation and effect of: — roll control: ailerons and spoilers, — pitch control: elevators, stabilators, variable incidence stabilizers and canards, — yaw control, rudder limiters; Control using elevons, ruddervators High lift devices: slots, slats, flaps; Drag inducing devices: spoilers, lift dumpers, speed brakes Operation and effect of trim tabs, servo tabs, control surface bias;	-	1
(b) Rotary Wing Aerodynamics Terminology; Operation and effect of cyclic, collective and anti-torque controls.	-	1
13.2 Structures — General Concepts (a) General concepts; Zonal and station identification systems; Electrical bonding; Lightning strike protection provisions.	-	2
(b) Fundamentals of structural systems.	-	1
13.3 Auto flight (ATA 22) (a) Fundamentals of automatic flight control: Working principles and current terminology; Command signal processing; Modes of operation: roll, pit.ch, and yaw channels; Yaw dampers; Stability augmentation system in helicopters; Automatic trim control; Autopilot navigation aids interface.	-	3
(b) Auto throttle systems and automatic landing systems: Principles and categories; Modes of operation; Approach; Glideslope; Land, go around; System monitors and failure conditions.	-	3
13.4 Communication/ Navigation (ATA 23/34) (a) Fundamentals of communication and navigation systems: Radio wave propagation, antennas, transmission lines, communication, receiver, and transmitter; Working principles of the following systems: Very high frequency (VHF) communications; High-frequency (HF) communications; Satellite communications (SATCOM); Controller pilot data link communications {CPDLC);Audio systems; Emergency locator transmitters (ELTs); Cockpit voice recorder(CVR); Very high frequency omnidirectional range (VOR); Automatic direction finding (ADF); Instrument landing system (ILS); Flight director systems (FDSs), distance measuring equipment (DME); Area navigation (RNAV) systems; Flight management systems (FMSs); Global navigation satellite systems (GNSSs), Global Positioning System (GPS), ground-based augmentation system (GBAS), satellite-based augmentation system (SBAS) such as the European geostationary navigation overlay service (EGNOS) and the wide area augmentation system (WAAS); Data link and two-way data link.	-	3
(b) Fundamentals of aircraft surveillance systems: Air traffic control transponder, secondary surveillance radar; Traffic alert and collision avoidance system (TCAS); Weather avoidance radar; Radio altimeter; Automatic dependent surveillance broadcast (ADS-B) and its other associated services such as FIS-B, TIS-B and multilink; Inertial navigation system (INS); ARINC (Aeronautical Radio Incorporated) communication and reporting.	-	3
13.5 Electrical Power (ATA 24) Installation and Operation of batteries; DC power generation; AC power generation; Emergency power generation; Voltage regulation; Power distribution; Inverters, transformers, rectifiers; Circuit protection; External/Ground power.	-	3

13.6 Equipment and Furnishings (ATA 25) Electronic emergency equipment requirements;	-	3
13.7 Flight Controls (ATA 27) (a) Primary and secondary flight controls (ATA 27): Primary controls: aileron, elevator, rudder, spoiler; Trim control: trim tabs; High-lift devices; System operation: manual; Gust locks and gust lock systems; Artificial feel, yaw damper, Mach trim, rudder limiter; Stall-warning systems.	-	2
(b) Actuation and protection: Active load control; Lift dump, speed brakes; Hydraulic, pneumatic systems; Stall-protection systems.	-	2
(c) System operation: System operation: electrical, fly-by-wire.	-	3
(d) Rotorcraft flight controls (ATA 67) Rotorcraft: controls: cyclic control, collective control, swashplate, yaw control	-	2
13.8 Instruments (ATA 31): Classification; Atmosphere; Terminology; Pressure measuring devices and systems; Pitot static systems; Altimeters; Vertical speed indicators; Airspeed indicators; Mach meters; Altitude reporting/alerting systems; Air data computers; Instrument pneumatic systems; Direct reading pressure and temperature gauges; Temperature indicating systems; Gyroscopic principles; Artificial horizons; Slip indicators; Directional gyros; Ground Proximity Warning Systems; (GPWSs); Compass systems; Flight data recording systems (FDRSs); Electronic flight instrument systems (EFISs) typical system arrangements and cockpit layout; Instrument warning systems, including master warning systems and centralised warning panels; Stall-warning systems and angle-of-attack indicating systems; Vibration measurement and indication; Glass cockpit; Types and uses of general test equipment for avionics.	-	3
13.9 Lights (ATA 33) External: navigation, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	-	3
13.10 On Board Maintenance Systems (ATA 45) Central maintenance computers; Data loading system; Electronic library system; Printing; Structure monitoring (damage tolerance monitoring).	-	3
13.11 Air Conditioning and Cabin Pressurization (ATA21) (a) pressurization: pressurization systems; Cabin pressure controllers, control and safety valves; Control and indication	-	3
(b) Air supply: Sources of air supply including engine bleed, APU and ground cart; Distribution systems	-	1
(c) Air-conditioning	-	3
(d) Safety and warning devices	-	3
13.12 Fire Protection (ATA 26) (a) Fire and smoke detection system and fire- extinguishing systems; Fire and smoke detection and warning systems; Fire-extinguishing systems; System tests.	-	3
(b)Portable fire extinguisher	-	1

13.13 Fuel Systems (ATA 28, ATA 47) (a) System layout: System layout; Fuel tanks; Supply systems.	-	1
(b) Fuel handling; Cross-feed and transfer; Refuelling and defuelling.	-	2
(c) Indications and warnings	-	3
(d) Special systems: Dumping, venting and draining; inert gas system	-	1
(e) Balancing: Longitudinal balance fuel systems.	-	3
13.14 Hydraulic Power (ATA 29) (a) System layout: System layout; Hydraulic fluids; Hydraulic reservoirs and accumulators; Filters; Power distribution.	-	1
(b) System operation (1): Pressure generation: electric and mechanical; Pressure control; Indication and warning systems; Servicing.	-	3
(c) System operation (2): Pressure generation: pneumatic; Emergency pressure generation; Interface with other systems.	-	3
13.15 Ice and Rain Protection (ATA 30) (a) Principles: Ice formation, classification, and detection	-	2
(b) De-Icing: De-Icing systems; Electrical, Hot air, Pneumatic and chemical probe and drain heating	-	3
(c) Anti-icing: Anti-Icing systems: electrical, hot-air, and chemical	-	2
(d) Wiper systems.	-	1
(e) Rain repellant	-	1
13.16 Landing gear (ATA 32) (a) Description: Construction, shock absorbing; Tyres.	-	1
(b) Systems: Extension and retraction systems: normal and emergency; Indications and warnings; Wheels, brakes, antiskid, and auto-braking; Steering		3
(c) Air ground sensing		3
13.17 Oxygen (ATA 35) System lay-out: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings.	-	3
13.18 Pneumatic/ Vacuum (ATA 36) System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.	-	2
13.19 Water/ Waste (ATA 38) Water system lay-out, supply, distribution, servicing and draining; Toilet system lay-out, flushing and servicing.	-	2
13.20 Integrated Modular Avionics (IMA) (ATA 42) (a) Overall system description and theory: Core system; Network components. Note: Functions that may be typically integrated into the integrated modular avionics (IMA) modules are, among others: Bleed management; Air pressure control; Air ventilation and control; Avionics and cockpit ventilation control, temperature control; traffic communication; Avionics communication router; electrical load management; Air Circuit breaker monitoring; electrical system built-in test equipment (BITE); Fuel management; Braking control; Steering control; Landing gear extension and retraction; Tyre pressure indication; Oleo pressure indication; Brake temperature monitoring.	-	3
(b) Typical system layouts.	-	3

13.21 Cabin Systems (ATA 44) System architecture, operation and control of systems for:-passenger in-flight entertainment; -communication within the aircraft (cabin intercommunication data system (CIDS); -communication between the aircraft cabin and ground stations, including voice, data, music and video transmission. CIDS interface between cockpit/cabin crew and cabin systems; Data exchange between the different related line replaceable units (LRUs); Flight attendant panels (FAPs). CNS server and Interfaces with the following systems: Data/radio communication system; Cabin core system (CCS); In-flight entertainment system (IFES); External communication system (ECS); Cabin mass memory system (CMMS); Cabin monitoring system (CMS); Miscellaneous cabin systems (MCSs). The CNS may host functions such as: access to pre departure/ departure reports; email/ Intranet/ Internet access; passenger database.	-	3
13.22 Information Systems (ATA 46) The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. They include units that are dedicated to the information storage and retrieval function, such as the electronic library mass storage and controller, but they do not include units or components Installed for other uses and shared with other systems, such as flight deck printer or general-use display. Typical examples include: - air traffic and information; -management systems and network; -server systems; aircraft general; -information system; flight deck; -information system; maintenance; -information system; passenger; -cabin information system; -miscellaneous information systems; -other linked systems.	-	3

MODULE 14. PROPULSION

	B1.1	B2
14.1 Engines (a) Constructional arrangement and operation of turbojet, turbofan, turbo-shaft, and turboprop engines.	-	1
(b) Constructional arrangement and operation of auxiliary power units (APUs).	-	1
(c) Constructional arrangement and operation of piston engines.	-	1
(d) Constructional arrangement and operation of electric and hybrid engines, their electric energy storage and control systems.	-	2
(e) Electronic engine control and fuel-metering systems (full authority digital engine control {FADEC)).	-	2
14.2 Electric/ electronic engine indication systems Exhaust gas temperature / Interstage turbine temperature systems; Cylinder head temperature, engine coolant temperature, engine speed; Engine thrust Indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems; Vibration measurement systems; OIL pressure and temperature; Fuel pressure, temperature, and flow; Manifold pressure; Engine torque.	-	2
14.3 Propeller .systems Propeller speed indication; Speed control and pitch change methods electrical/ electronic; Synchronising and synchrophasing equipment; electrical anti-icing/de-icing equipment.	-	2
14.4 Starting and ignition systems Operation of engine start systems and components; -Ignition systems and components; Maintenance safety requirements**.**	-	2

MODULE 15. GAS TURBINE ENGINE

	B1.1	B2
15.1 Fundamentals Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle; The relationship between force, work, power, energy, velocity and acceleration; Constructional arrangement and operation of turbojet, turbofan, turbo shaft, turboprop and geared turbofan engines.	2	-
15.2 Engine Performance Gross thrust, net thrust, choked nozzle thrust, thrust distribution, resultant thrust, thrust horsepower, equivalent shaft horsepower, specific fuel consumption; Engine efficiencies; By-pass ratio and engine pressure ratio; Pressure, temperature and velocity of the gas flow; Engine ratings, static thrust, influence of speed, altitude and hot climate, flat rating, limitations.	2	-
15.3 Inlet Compressor inlet ducts Effects of various inlet configurations; Ice protection.	2	-
15.4 Compressors Axial and centrifugal types; Constructional features and operating principles and applications; Fan balancing; Operation: Causes and effects of compressor stall and surge; Methods of air flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades; Compressor ratio.	2	-
15.5 Combustion Section Constructional features and principles of operation.	2	-
15.6 Turbine Section Operation and characteristics of different turbine blade types; Blade to disk attachment; Nozzle guide vanes; Causes and effects of turbine blade stress and creep.	2	-
15.7 Exhaust Constructional features and principles of operation; Convergent, divergent and variable area nozzles; Engine noise reduction; Thrust reversers.	2	-
15.8 Bearings and Seals Constructional features and principles of operation.	2	-
15.9 Lubricants and Fuels Properties and specifications of standard, alternate, and drop-in fuel; Properties and specifications of lubricants; Fuel additives; Safety precautions.	2	-
15.10 Lubrication Systems System operation/ lay-out and components.	2	-
15.11 Fuel Systems Operation of engine control and fuel-metering systems, including electronic engine control (full authority digital engine control (FADEC)) and electronic power augmentation; System layout and components.	2	-
15.12 Air Systems Operation of engine air distribution and anti-ice control systems, including internal cooling, sealing and external air services.	2	-
15.13 Starting and Ignition Systems Operation of engine start systems and components; Ignition systems and components; Maintenance safety requirements.	2	-

15.14 Engine Indication Systems Exhaust Gas Temperature/Interstage Turbine Temperature; Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems; Oil pressure and temperature; Fuel pressure and flow; Engine speed; Vibration measurement and indication; Torque; Power.	2	-
15.15 Alternate turbine constructions Geared turbofan (GTF); Variable fan blades; Open rotor/ propfan; Hybrid turbine-electric concepts and electric power augmentation; Future trends and developments.	1	-
15.16 Turbo-prop Engines Gas coupled/free turbine and gear coupled turbines; Reduction gears; Integrated engine and propeller controls; Over speed safety devices.	2	-
15.17 Turbo-shaft engines Arrangements, drive systems, reduction gearing, couplings, control systems.	2	-
15.18 Auxiliary Power Units (APUs) Purpose, operation, protective systems.	2	-
15.19 Power plant Installation Configuration of firewalls, cowlings, acoustic panels, engine mounts, anti-vibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.	2	-
15.20 Fire Protection Systems Operation of detection and extinguishing systems.	2	-
15.21 Engine Monitoring and Ground Operation Procedures for starting and ground run-up; Interpretation of engine power output and parameters; Trend (including oil analysis, vibration and borescope) monitoring; Inspection of engine and components to criteria, tolerances and data specified by engine manufacturer; Compressor washing/cleaning; Foreign Object Damage (FOD).	3	-
15.22 Engine Storage and Preservation Preservation and depreservation for the engine and accessories/ systems.	2	-

MODULE 17A. PROPELLER	B1.1	B2
17.1 Fundamentals Blade element theory; High/low blade angle, reverse angle, angle of attack, rotational speed; Propeller slip; Aerodynamic, centrifugal, and thrust forces; Torque; Relative airflow on blade angle of attack; Vibration and resonance.	2	-
17.2 Propeller Construction Construction methods and materials used in wooden, composite and metal propellers; Blade station, blade face, blade shank, blade back/ thrust face and hub assembly; Fixed pitch, controllable pitch, constant speeding propeller; Propeller/spinner installation.	2	-
17.3 Propeller Pitch Control Speed control and pitch change methods, mechanical and electrical/electronic; Feathering and reverse pitch; Over speed protection.	2	-
17.4 Propeller Synchronizing Synchronizing and synchrophasing equipment.	2	-
17.5 Propeller Ice Protection Fluid and electrical de-icing equipment.	2	-
17.6 Propeller Maintenance Static and dynamic balancing; Blade tracking; Assessment of blade damage, erosion, corrosion, impact damage, delamination; Propeller treatment/repair schemes; Propeller engine running.	3	-
17.7 Propeller Storage and Preservation Propeller preservation and depreservation	2	-

REFERENCE BOOKS

Library reference books for CAR 66 modular examinations

Writer	Name of book	Applicable modules
AC Parkinson's	Machine Drawing	7A
AC Kermode	Mechanics of Flight	8, 11A,13
AIRCRAFT TECH BOOK CO.	EASA Module-03 Electrical Fundamental	3
AIRCRAFT TECH BOOK CO.	EASA Module- 04 Electrical Fundamental Aviation Maintenance Technician Certification Series	4
AIRCRAFT TECH BOOK CO.	EASA Module-05Electronic Instrument System	5
AIRCRAFT TECH BOOK CO.	EASA Module-06 Hardware And Materials	6
AIRCRAFT TECH BOOK CO.	EASA Module-07A Maintenance Practices	7A
AIRCRAFT TECH BOOK CO.	EASA Module- 08 Basic Aerodynamics	8
AIRCRAFT TECH BOOK CO.	EASA Module-09 Human Factors	9A
AIRCRAFT TECH BOOK CO.	EASA Module-11A for Level-B1.1 Turbine Aero plane Structures and systems	11A
AIRCRAFT TECH BOOK CO.	EASA Module-13 Aircraft Structures and Systems	13
AIRCRAFT TECH BOOK CO.	EASA Module-14 Propulsion	14
AIRCRAFT TECH BOOK CO.	EASA Module-15 Gas Turbine Engine	15
AIRCRAFT TECH BOOK CO.	EASA Module-17 A Propeller	17A
Albert D Helfrick	Modern Aviation Electronics	5,13
B.L.Theraja	Electrical Technology	3,4,5,11A,13
Bernard Grob	Basic Electronics	3, 4,5,13
Brain Kendel	Manual of Avionics	11A,13
C.A. Williams	Aircraft Instruments	11A
CAA	CAP 715 - An Introduction to Aircraft Maintenance Engineering Human Factors for JAR 66	7A,9A
CAA	CAP 716 - Aviation Maintenance Human Factors (EASA Part-145)	9A
CAA	CAP 718 - Human Factors in Aircraft Maintenance and Inspection	7A,9A
CAIP I	Civil Aircraft Inspection Procedures (CAP 459)- **Part I**, Basic	4,6,7A,11A

Writer	Name of book	Applicable modules
CAIP II	Civil Aircraft Inspection Procedure (CAP 459)- **Part II**	4, 5,7A,11A, 13, 15, 17A
Casamassa & Ralph D Bent	Jet Aircraft power Systems	14,15
Cindy Foreman	Advanced Composites	6,7A,11A
Clancy	Aerodynamics	8,11A,13
Dale Crane & R.Scheppler	Aircraft Oxygen System	6,11A
Dale Crane	Airframe Structures, Vol-I	6,11A,13
Dale Crane	Basic Electricity for A & P Mechanics	3,13
Dale Crane	A & P Mechanics	6,13
Dale Crane	Basic Electronics and Radio Installation	11A,13
Dale Crane	Aviation Maintenance Technician Series (A/F Structure)	7A,11A,17A
Dale Crane	Aviation Maintenance Technician Series (A/F System)	11A,13
Dale Crane	Aviation Maintenance Technician Series (Power Plant)	7A,11A,13,15, 17A
David Herris	Flight Instrument & AFCA	5,13
DGCA	Airworthiness Advisory Circulars	7A, 10
DGCA	Civil Aviation Requirements (CAR) relevant to CAR-66 syllabus	10
DGCA	Civil Aviation Procedures (CAP) relevant to CAR-66 syllabus	10
E.H.J. Pallett	Aircraft Instruments	4,5,7A, 11A, 13,14
E.H.J. Pallett	Aircraft Instruments and Integrated System	4,5,7A,11A, 13,14
E.H.J.Pallett	Automatic Flight Control	7A,11A,13
E.H.J.Pallett	Aircraft Electrical System	3,11A,13
Edward Hughes	Electrical & Electronics Technology	3,5,13
FAA	Aviation Maint. Technician Hand Book-General -9A	3,6,7A,11A, 13,15
FAA	Aviation Maint Technician Hand Book-Airframe -15A	6,7A,11A,13,15
FAA	Aviation Maint Technician Hand Book-Power Plant -12A	6,7A,11A,14, 15,17A
FAA	Air frame Test Guide (Mechanic)	7A,11A,13
FAA	Aviation Maintenance Technician Hand book	6,7A,11A,13
FAA H 8083-30	Aviation Maint. Technician Handbook-General	6,7A
FAA H- 8083-32	Aviation Maint. Technician Handbook-Power plant (Vol-II)	11A,13,14, 15,17A

Writer	Name of book	Applicable modules
FAA H- 8083-31	Aviation Maint. Technician Handbook-Airframe (Vol-I)	6,7A,11A,13
FAA H- 8083-31	Aviation Maint. Technician Handbook-Airframe (Vol-II)	6,7A,11A,13
Frank Delp	Aircraft Propeller and Controls	11A,15,17A
George F. Titterton	Aircraft Materials and Processes	6,7A,11A
George Kennedy	Electronic Communication System	4,13
Govt. of India	Aircraft Act 1934	10
Govt. of India	Aircraft Rule 1937	10
Ian Moir and Allan Seabridge	Civil Avionics Systems	4,11A,13
ICAO Doc 9683	Human Factors Training Manual	9A
ICAO Doc 9806	Human Factors Guidelines for Safety Audits Manual	9A
ICAO Doc 9824	Human Factor Guidelines for A/c Maintenance Manual	9A
IrwineTreager	Aircraft Gas Turbine Technology	6,14,15
J.E Heywood	Light Aircraft Maintenance	11A
J.Powell	Aircraft Radio System	4,13
J.Seddon	Basic Helicopter Aerodynamics	15
J Anderson &Tatro	Shop Theory	6,7A
Jeppesen	A & P Technician Air Frame Text Book	6,7,8,11A,13,15, 17A
Jeppesen	Avionics Fundamental	4,13
Jeppesen	Aircraft A & P Technician Power Plant	11A,13, 15, 17A
Jeppesen	Transport Category Aircraft System	11A,13
Joe Christy	Aircraft Construction Repair and Inspection	6,7A,11A
Joseph Schafer	Basic helicopter maintenance	13
John M Ferrara	Aviation Electronics	4,13
Kayton / Fried	Avionics Navigation System	13
Keith W.Bose	Aviation electronics	5,13
Kennedy/Davis	Electrical Communication System	5,13
Kroes& Wild	Aircraft Power Plants	7A,14,15,17A
Kroes, Watkins, Delp	Aircraft Maintenance & Repair	7A,11A,13,17A
Lalit Gupta	Aircraft Structure	6,11A,13
Larry Reithmaier	Aircraft Mechanics Shop Manual	6,7A
Larry Reithmaier	Aircraft Repair Manual	6,7A
M Guillon	Hydraulic Servo Systems	11A,13

Writer	Name of book	Applicable modules
Malvino and Leech	Digital Principle And Applications	5,13
Mathur	Introduction to Microprocessor	5,13
Mike Tooley	Aircraft Digital Electronic and Computer System	3,5,11A,13
Mike Tooley& David Wyatt	Aircraft Electrical & Electronic Systems	4,5,6,11A,13
Millman and Halkias	Integrated Electronics	4,13
R.W.Prouty	Helicopter Aerodynamics	8
Rolls Royce	The Jet Engine	15
Sterling	Basic Synchros and Servomechanism Part – I & II	4,13
Thomas K Eismin	Aircraft Electricity & Electronics	3,4,5,7A,11A, 13
Thomas. W. Wild	Transport Category Aircraft System	11A,13
V K Mehta	Principles of Electronics	4,5,13
William Shepard	Human Factor Guide for Aircraft Maintenance (FAA)	9A

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