CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
7.6 Fits and clearances		
Drill sizes for bolt holes, classes of fits;	Nil	Nil
Common system of fits and clearances;	Nil	Nil
Schedule of fits and clearances for aircraft and engines;	Nil	Nil
Limits for bow, twist and wear;	Nil	Nil
Standard methods for checking shafts, bearings and other parts.	Nil	Nil
7.7 Electrical cables and connectors		
Continuity, insulation and bonding techniques and testing;	BA	QB
Use of crimp tools: hand and hydraulic operated;	BA	QB
Testing of crimp joints;	BA	QB
Connector pin removal and insertion;	BA	QB
Co-axial cables: testing and installation precautions;	Nil	QB
Wiring protection techniques: cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding.	Nil	Nil
7.8 Riveting		
Riveted joints, rivet spacing and pitch;	FG or FI	Nil
Tools used for riveting and dimpling;	FG or FI	Nil
Inspection of riveted joints.	FG or FI	Nil
7.9 Pipes and hoses		
Bending and belling and flaring aircraft pipes;	FA	Nil
Inspection and testing of aircraft pipes and hoses;	FA	Nil
Installation and clamping of pipes.	FA	Nil
7.10 Springs		
Inspection and testing of springs.	BA	Nil
7.11 Bearings		
Testing, cleaning and inspection of bearings;	BA	Nil
Lubrication requirements of bearings;	BA	Nil

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Defects in bearings and their causes.	BA	Nil
7.12 Transmissions		
Inspection of gears, backlash;	BA	Nil
Inspection of belts and pulleys, chains and sprockets;	BA	Nil
Inspection of screw jacks, lever devices, push-pull rod systems.	BA	Nil
7.13 Control cables		
Swaging of end fittings;	BB	Nil
Inspection and testing of control cables;	BB	Nil
Bowden cables;	BB	Nil
Aircraft flexible control systems.	BB	Nil
7.14 Material handling		
7.14.1 Sheet Metal		
Marking out, and calculation of, bend allowance;	FG	Nil
Sheet metal working including bending and forming;	FG	Nil
Inspection of sheet metal work.	FG	Nil
7.14.2 Composite and non-metallic		
Bonding practices;	FG, FI, or FP	Nil
Environmental conditions;	FP	Nil
Inspection methods.	FP	Nil
7.15 Welding, brazing, soldering and bonding		
(a)		
Soldering methods, inspection of soldered joints;	BA	QB
(b)		
Welding and brazing methods;	BA	Nil
Inspection of welded and brazed joints;	BA	Nil
Bonding methods and inspection of bonded joints.	FG	Nil
7.16 Aircraft weight and balance		

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
(a)		
Centre of gravity and balance limits calculation: use of relevant documents;	BB	Nil
(b)		
Preparation of aircraft for weighing;	Nil	Nil
Aircraft weighing.	Nil	Nil
7.17 Aircraft handling and storage		
Aircraft taxiing and towing and associated safety precautions;	BA	Nil
Aircraft jacking, chocking, securing and associated safety precautions;	BA	Nil
Aircraft storage methods;	Nil	Nil
Refuelling and defuelling procedures;	BA	Nil
De-icing and anti-icing procedures;	BA	Nil
Electrical, hydraulic and pneumatic ground supplies;	Nil	Nil
Effects of environmental conditions on aircraft handling and operation.	Nil	Nil
7.18 Disassembly, inspection, repair and assembly techniques		
(a)		
Types of defects and visual inspection techniques;	FG	Nil
Corrosion	BA	Nil
Corrosion removal, assessment and reprotection;	BA	Nil
(b)		
General repair methods, Structural Repair Manual;	FG or FI	Nil
Ageing, fatigue and corrosion control programs;	FG or FI	Nil
(c)		
Non-destructive inspection techniques including: penetrant,	BA	Nil
radiographic, eddy current, ultrasonic and boroscope methods	BA	Nil

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
(d)		
Disassembly and re-assembly techniques;	Nil	Nil
(e)		
Trouble shooting techniques.	Nil	Nil
7.19 Abnormal events		
(a)		
Inspections following lightning strikes and HIRF penetration.	FG or FI	Nil
(b)		
Inspections following abnormal events such as heavy landings and flight through turbulence.	FG or FI	Nil
7.20 Maintenance procedures		
Maintenance planning;	Nil	Nil
Modification procedures;	Nil	Nil
Stores procedures;	Nil	Nil
Certification and release procedures;	Nil	Nil
Interface with aircraft operation;	Nil	Nil
Maintenance inspection, quality control and quality assurance;	Nil	Nil
Additional maintenance procedures;	Nil	Nil
Control of life limited components.	Nil	Nil

Module 8 Basic Aerodynamics (B1 & B2)

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
8.1 Physics of the atmosphere		
International Standard Atmosphere (ISA), application aerodynamics.	BB	IA or QB
8.2 Aerodynamics		
Air flow around a body;	BB	QB
Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, up wash and downwash, vortices, stagnation;	BB	QB
The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash in and washout, fineness ratio, wing shape and aspect ratio;	BB	QB
Thrust, weight, aerodynamic resultant;	BB	QB
Generation of lift and drag: angle of attack, lift coefficient, drag coefficient, polar curve, stall;	BB	QB
Aerofoil contamination including ice, snow, frost.	BB	Nil
8.3 Theory of flight		
Relationship between lift, weight, thrust and drag;	BB	QB
Glide ratio;	BB	QB
Steady state flights, performance;	BB	QB
Theory of the turn;	BB	QB
Influence of load factor: stall, flight envelope and structural limitations;	BB	QB
Lift augmentation.	BB	QB
8.4 Flight stability and dynamics		
Longitudinal, lateral and directional stability (active and passive).	BB	QB

Module 9 Human factors (B1 & B2)

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
9.1 General		
The need to take human factors into account;	Nil	Nil
Incidents attributable to human factors and human error;	Nil	Nil
“Murphy’s” law.	Nil	Nil
9.2 Human performance and limitations		
Vision;	Nil	Nil
Hearing;	Nil	Nil
Information processing;	Nil	Nil
Attention and perception;	Nil	Nil
Memory;	Nil	Nil
Claustrophobia and physical access.	Nil	Nil
9.3 Social psychology		
Responsibility: individual and group;	Nil	Nil
Motivation and de-motivation;	Nil	Nil
Peer pressure;	Nil	Nil
Culture issues;	Nil	Nil
Team working;	Nil	Nil
Management, supervision and leadership.	Nil	Nil
9.4 Factors affecting performance		
Fitness and health;	Nil	Nil
Stress: domestic and work related;	Nil	Nil
Time pressure and deadlines;	Nil	Nil
Workload: overload and underload;	Nil	Nil
Sleep and fatigue, shiftwork;	Nil	Nil
Alcohol, medication, drug abuse.	Nil	Nil
9.5 Physical environment		

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Noise and fumes;	Nil	Nil
Illumination;	Nil	Nil
Climate and temperature;	Nil	Nil
Motion and vibration;	Nil	Nil
Working environment.	Nil	Nil
9.6 Tasks		
Physical work;	Nil	Nil
Repetitive tasks;	Nil	Nil
Visual inspection;	Nil	Nil
Complex systems.	Nil	Nil
9.7 Communication		
Within and between teams;	Nil	Nil
Work logging and recording;	Nil	Nil
Keeping up-to-date, currency;	Nil	Nil
Dissemination of information.	Nil	Nil
9.8 Human error		
Error models and theories;	Nil	Nil
Types of error in maintenance tasks;	Nil	Nil
Implications of errors (i.e. accidents);	Nil	Nil
Avoiding and managing errors.	Nil	Nil
9.9 Hazards in the workplace		
Recognising and avoiding hazards;	Nil	Nil
Dealing with emergencies.	Nil	Nil

Module 10 Aviation legislation (B1 & B2)

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
10.1 Regulatory Framework		
Role of International Civil Aviation Organization;	AA	AA
Role of CASA;	AA	AA
Relationship between Parts 21, 42, 66, 145 and 147 of CASR 1998;	AA	AA
Relationship with other aviation authorities.	AA	AA
10.2 Part 66 Certifying Staff		
Detailed understanding of Part 66 of CASR 1998.	AA	AA
10.3 Part 145 – Approved maintenance organisations		
Detailed understanding of Part 145 of CASR 1998.	AA	AA
10.4 Air operations		
Air Operators' Certificates;	AA	AA
Operators' responsibilities, in particular regarding continuing airworthiness and maintenance;	AA	AA
Aircraft maintenance program;	AA	AA
MEL/CDL;	AA	AA
Documents to be carried on board;	AA	AA
Aircraft placarding (markings).	AA	AA
10.5 Certification of aircraft, parts and appliances		
(a) General		
General understanding of Parts 21, 23, 25, 27 and 29 of CASR 1998;	AA	AA
(b) Documents		
Certificates of Airworthiness;	AA	AA
Restricted Certificates of Airworthiness;	AA	AA
Special Flight Permits;	AA	AA
Certificates of Registration;	AA	AA

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Noise Certificates;	AA	AA
Weight Schedules;	AA	AA
Radio Station Licences and Approvals.	AA	AA
10.6 Parts 21 and 42		
(a)		
Detailed understanding of Part 21 of CASR 1998 provisions relating to continuing airworthiness;	AA	AA
(b)		
Detailed understanding of Part 42 of CASR 1998.	AA	AA
10.7 Applicable national and international requirements		
(a)		
Management programs, maintenance checks and inspections;	AA	AA
Master Minimum Equipment Lists, Minimum Equipment List, Dispatch Deviation Lists;	AA	AA
Airworthiness Directives;	AA	AA
Service bulletins, manufacturers' service information;	AA	AA
Modification and repairs;	AA	AA
Maintenance documentation: maintenance manuals, structural repair manuals, illustrated parts catalogue, etc.	AA	AA
(b)		
Continuing airworthiness;	AA	AA
Test flights;	AA	AA
ETOPS, maintenance and despatch requirements;	AA	AA
All weather operation: category 2 and 3 operations and minimum equipment requirements.	AA	AA

Module 11A Turbine Aeroplane aerodynamics, structures and systems (B1.1 Licence)

CASA module Examination subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
11.1 Theory of flight		
11.1.1 Aeroplane aerodynamics and flight controls		
Operation and effect of:		
Roll control: ailerons and spoilers;	BB	QB
Pitch control: elevators, stabilators, variable incidence stabilisers and canards;	BB	QB
Yaw control, rudder limiters;	BB	QB
Control using elevons, ruddervators;	BB	QB
High lift devices, slots, slats, flaps, flaperons;	BB	QB
Drag inducing devices, spoilers, lift dumpers, speed brakes;	BB	QB
Effects of wing fences, sawtooth leading edges;	BB	Nil
Boundary layer control using, vortex generators, stall wedges or leading edge devices;	BB	Nil
Operation and effect of trim tabs, balance and anti-balance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels.	BB	Nil
11.1.2 High speed flight		
Speed of sound, subsonic flight, transonic flight, supersonic flight;	BB	QB
Mach number, critical Mach number, compressibility buffet, shockwave, aerodynamic heating, area rule;	BB	QB
Factors affecting airflow in engine intakes of high speed aircraft;	BB	QB
Effects of sweepback on critical Mach number.	BB	QB
11.2 Airframe structures — general concepts		
(a)		
Airworthiness requirements for structural strength;	FG	Nil
Structural classification, primary, secondary and tertiary;	FG	Nil
Fail safe, safe life, damage tolerance concepts;	FG	Nil

CASA module Examination subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Zonal and station identification systems;	FG	QB
Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue;	FG	Nil
Drains and ventilation provisions;	FG	Nil
System installation provisions;	FG	Nil
Lightning strike protection provision;	FG	Nil
Aircraft bonding;	FG	QB
(b)		
Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments;	FG	Nil
Structure assembly techniques: riveting,	FG	Nil
bolting,	BA	Nil
bonding;	FG	QB
Methods of surface protection, such as chromating, anodising, painting;	FG	Nil
Surface cleaning;	FG	Nil
Airframe symmetry: methods of alignment and symmetry checks.	FG	Nil
11.3 Airframe structures — aeroplanes		
11.3.1 Fuselage (ATA52/53/56)		
Construction and pressurisation sealing;	FG	Nil
Wing, stabiliser, pylon and under carriage attachments;	FG	Nil
Seat installation and cargo loading system;	FG	Nil
Doors and emergency exits: construction, mechanisms, operation and safety devices;	FG	Nil
Windows and windscreen construction and mechanisms.	FG	Nil
11.3.2 Wings (ATA57)		
Construction;	FG	Nil

CASA module Examination subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Fuel storage;	FG	Nil
Landing gear, pylon, control surface and highlift and drag attachments.	FG	Nil
11.3.3 Stabilisers (ATA55)		
Construction;	FG	Nil
Control surface attachment.	FG	Nil
11.3.4 Flight control surface (ATA55/57)		
Construction and attachment;	FG	Nil
Balancing — mass and aerodynamic.	FG	QB
11.3.5 Nacelles and pylons (ATA54)		
Construction;	FG	Nil
Firewalls;	FG	Nil
Engine mounts.	FG	Nil
11.4 Air-conditioning and cabin pressurisation (ATA21)		
11.4.1 Air supply		
Sources of air supply including engine bleed, APU and ground cart.	FM	ED
11.4.2 Air-conditioning		
Air-conditioning systems;	FM	EB & ED
vapour cycle machines;	FM	EB
Air cycle and	FM	ED
Distribution systems;	FM	EB & ED
Flow, temperature and humidity control system.	FM	EB & ED
11.4.3 Pressurisation		
Pressurisation systems;	IM	IM
Control and indication including control and safety valves;	IM	IM
Cabin pressure controllers;	IM	IM
Heating systems.	FM	Nil

CASA module Examination subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
11.4.4 Safety and warning devices		
Protection and warning devices.	IM	IM
11.5 Instruments and avionic systems		
11.5.1 Instrument systems (ATA31)		
Pitot static: altimeter, airspeed indicator, vertical speed indicator;	BC	IA
Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator turn coordinator;	BC	IZ
Compasses: direct reading, remote reading;	BC	IZ
Angle of attack indication, stall warning systems;	Nil	Nil
Glass cockpit;	Nil	IZ
Other aircraft system indication.	Nil	IZ
11.5.2 Avionic systems		
Fundamentals of system layouts and operation of:		
Auto flight (ATA22);	BC	IF
Communications (ATA23);	Nil	WA & WZ
Navigation systems (ATA34).	Nil	WC & WD & WE & WJ
11.6 Electrical power (ATA24)		
Batteries installation and operation;	BC	EB
DC power generation;	BC	EB
AC power generation;	Nil	QD
Emergency power generation;	Nil	Nil
Voltage regulation;	BC	EB
Power distribution;	BC	ED
Inverters, transformers, rectifiers;	Nil	ED
Circuit protection;	BC	QB
External and ground power.	Nil	Nil
11.7 Equipment and furnishings (ATA25)		

CASA module Examination subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
(a)		
Emergency equipment requirements;	FG	Nil
Seats, harnesses and belts;	FG	Nil
(b)		
Cabin layout;	FG	Nil
Equipment layout;	FG	Nil
Cabin furnishing installation;	FG	Nil
Cabin entertainment equipment;	Nil	Nil
Galley installation;	FG	Nil
Cargo handling and retention equipment;	FG	Nil
Airstairs.	FG	Nil
11.8 Fire protection (ATA26)		
(a)		
Fire and smoke detection and warning systems;	BC	ED
Fire extinguishing systems;	BC	ED
System tests;	BC	ED
(b)		
Portable fire extinguisher.	BC	ED
11.9 Flight controls (ATA27)		
Primary controls: aileron, elevator, rudder, spoiler;	BB	QB
Trim control;	BB	QB
Active load control;	BB	QB
High lift devices;	BB	QB
Lift dump, speed brakes;	BB	QB
System operation: manual, hydraulic, pneumatic, electrical, fly by-wire;	BB	Nil
Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks systems;	BB	QB

CASA module Examination subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Balancing	BB	Nil
and rigging;	BB	Nil
Stall protection and warning system.	BB	QB
11.10 Fuel systems (ATA28)		
System layout;	FA	Nil
Fuel tanks;	FA	Nil
Supply systems;	FA	Nil
Dumping, venting and draining;	FA	Nil
Cross-feed and transfer;	FA	Nil
Indications and warnings;	FA	IA
Refuelling and defuelling;	FA	Nil
Longitudinal balance fuel systems.	FA	Nil
11.11 Hydraulic power (ATA29)		
System layout;	FF	Nil
Hydraulic fluids;	FF	Nil
Hydraulic reservoirs and accumulators;	FF	Nil
Pressure generation: electric, mechanical, pneumatic;	FF	Nil
Emergency pressure generation;	FF	Nil
Pressure control;	FF	Nil
Power distribution;	FF	Nil
Indication and warning systems;	FF	IA
Interface with other systems.	FF	Nil
11.12 Ice and rain protection (ATA30)		
Ice formation, classification and detection;	FG	ED
Anti-icing systems: electrical, hot air and chemical;	FG	ED
De-icing systems: electrical, hot air, pneumatic and chemical;	FG	ED
Rain repellent;	FG	Nil

CASA module Examination subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Probe and drain heating;	FG	ED
Wiper systems.	FG	Nil
11.13 Landing gear (ATA32)		
Construction, shock absorbing;	FG	Nil
Extension and retraction systems: normal and emergency;	FG	Nil
Indications and warning;	FG	EB
Wheels, brakes, antiskid and auto braking;	FF	ED
Tyres;	FA	Nil
Steering,	FF	Nil
Air-ground sensing.	FG	EB
11.14 Lights (ATA33)		
External: navigation, anti-collision, landing, taxiing, ice;	Nil	EB
Internal: cabin, cockpit, cargo; emergency.	Nil	EB
11.15 Oxygen (ATA35)		
System layout: cockpit, cabin;	FG	IZ
Sources, storage, charging and distribution;	FG	IZ
Supply regulation;	FG	IZ
Indications and warnings.	FG	IZ
11.16 Pneumatic and vacuum (ATA36)		
System layout;	FM IM	IM
Sources: engine and APU, compressors, reservoirs, ground supply;	FF	Nil
Pressure control;	IM FM	IM
Distribution;	FM IM	Nil
Indications and warnings;	FM IM	IM
Interfaces with other systems.	FM IM	Nil
11.17 Water and waste (ATA38)		
Water system layout, supply, distribution, servicing and	FG	Nil

CASA module Examination subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
draining;		
Toilet system layout, flushing and servicing;	Nil	Nil
Corrosion aspects.	FG	Nil
11.18 On-board maintenance systems (ATA45)		
Central maintenance computers;	Nil	Nil
Data loading system;	Nil	Nil
Electronic library system;	Nil	Nil
Printing;	Nil	Nil
Structure monitoring (damage tolerance monitoring).	Nil	Nil
11.19 Integrated modular avionics (ATA42)		
Functions that may be typically integrated in the integrated modular avionics (IMA) modules include: 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, core system, network components.	Nil	Nil
11.20 Cabin systems (ATA44)		
The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (cabin intercommunication data system) and between the aircraft cabin and ground stations (cabin network service). These include voice, data, music and video transmissions.	Nil	Nil
The cabin intercommunication data system provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRUs and they are typically operated via flight attendant panels.	Nil	Nil
The cabin network service typically consists on a server, typically interfacing with, among others, the following systems: data/radio communication, in-flight entertainment system.	Nil	Nil
The cabin network service may host functions such as:	Nil	Nil
· access to pre-departure/departure reports	Nil	Nil

CASA module Examination subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
· e-mail/intranet/internet access	Nil	Nil
· passenger database	Nil	Nil
· cabin core system	Nil	Nil
· in-flight entertainment system	Nil	Nil
· external communication system	Nil	Nil
· cabin monitoring system	Nil	Nil
· cabin mass memory system	Nil	Nil
· miscellaneous cabin system.	Nil	Nil
11.21 Information systems (ATA46)		
The units and components which furnish a means of storing, updating and retrieving digital information, traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. These do not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display.	Nil	Nil
Typical examples include: air traffic and information management systems; network server systems; aircraft general information system; flight deck information system; maintenance information system; passenger cabin information system; miscellaneous information system.	Nil	Nil

Module 11B – Piston Aeroplane aerodynamics, structures, and systems (B1.2 Licence)

CASA module Examination subjects	CASA Mechanical Basics exams equivalent	CASA avionics basics exams equivalent
11.1 Theory of flight		
11.1.1 Aeroplane aerodynamics and flight controls		
Operation and effect of the following:		
roll control: ailerons and spoilers	BB	QB
pitch control: elevators, stabilators, variable incidence stabilisers and canards	BB	QB
yaw control, rudder limiters	BB	QB
Control using elevons, ruddervators;	BB	QB
High-lift devices, slots, slats, flaps, flaperons;	BB	QB
Drag-inducing devices, spoilers, lift dumpers, speed brakes;	BB	QB
Effects of wing fences, sawtooth leading edges;	BB	Nil
Boundary layer control, using vortex generators, stall wedges or leading-edge devices;	BB	Nil
Operation and effect of trim tabs, balance and anti-balance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels.	BB	Nil
11.1.2 High-speed flight – (This subject not required for B1.2)	**This subject N/A for B1.2**	**This subject N/A for B1.2**
11.2 Airframe structures — general concepts		
(a)		
Airworthiness requirements for structural strength;	FG	Nil
Structural classification, primary, secondary and tertiary;	FG	Nil
Fail safe, safe life, damage tolerance concepts;	FG	Nil
Zonal and station identification systems	FG	QB
Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue;	FG	Nil
Drains and ventilation provisions;	FG	Nil

CASA module Examination subjects	CASA Mechanical Basics exams equivalent	CASA avionics basics exams equivalent
System installation provisions	FG	Nil
Lightning strike protection provision;	FG	Nil
Aircraft bonding	FG	QB
(b)		
Construction methods of stressed-skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments;	FG	Nil
Structure assembly techniques: riveting	FG	Nil
bolting	FG	Nil
bonding	FG	QB
Methods of surface protection, such as chromating, anodising, painting;	FG	Nil
Surface cleaning;	FG	Nil
Airframe symmetry: methods of alignment and symmetry checks.	FG	Nil
11.3 Airframe structures — aeroplanes		
11.3.1 Fuselage (ATA52/53/56)		
Construction and pressurisation sealing;	FG	Nil
Wing, tailplane, pylon and undercarriage attachments;	FG	Nil
Seat installation;	FG	Nil
Doors and emergency exits: construction and operation and safety devices	FG	Nil
Windows and windscreen construction and mechanisms.	FG	Nil
11.3.2 Wings (ATA57)		
Construction;	FG	Nil
Fuel storage;	FG	Nil
Landing gear, pylon, control surface and high-lift/drag attachments.	FG	Nil
11.3.3 Stabilisers (ATA55)		

CASA module Examination subjects	CASA Mechanical Basics exams equivalent	CASA avionics basics exams equivalent
Construction;	FG	Nil
Control surface attachment.	FG	Nil
11.3.4 Flight control surfaces (ATA55/57)		
Construction and attachment;	FG	Nil
Balancing — mass and aerodynamic	FG	QB
11.3.5 Nacelles and pylons (ATA54)		
Construction	FG	Nil
Firewalls	FG	Nil
Engine mounts.	FG	Nil
11.4 Air-conditioning and cabin pressurisation (ATA21)		
Pressurisation and air-conditioning systems;	FM	EB & ED
Cabin pressure controllers;	IM	IM
Protection and warning devices;	IM	IM
Heating systems	FM	Nil
11.5 Instruments and avionic systems		
11.5.1 Instrument systems (ATA31)		
Pitot static: altimeter, airspeed indicator, vertical speed indicator;	BC	IA
Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator;	BC	IZ
Compasses: direct reading, remote reading;	BC	IZ
Angle of attack indication, stall warning systems;	Nil	Nil
Glass cockpit;	Nil	IZ
Other aircraft system indication.	Nil	IZ
11.5.2 Avionic systems		
Fundamentals of system layouts, and operation of the following:		
auto flight (ATA22)	BC	IF

CASA module Examination subjects	CASA Mechanical Basics exams equivalent	CASA avionics basics exams equivalent
communications (ATA23)	Nil	WA & WZ
navigation systems (ATA34)	Nil	WC & WD & WE & WJ
11.6 Electrical power (ATA24)		
Batteries installation and operation;	BC	EB
DC-power generation	BC	EB
Voltage regulation	BC	EB
Power distribution;	BC	ED
Circuit protection;	BC	QB
Inverters, transformers.	Nil	ED
11.7 Equipment and furnishings (ATA25)		
(a)		
Emergency equipment requirements;	FG	Nil
Seats, harnesses and belts;	FG	Nil
(b)		
Cabin layout;	FG	Nil
Equipment layout;	FG	Nil
Cabin furnishing installation;	FG	Nil
Cabin entertainment equipment;	Nil	Nil
Galley installation;	FG	Nil
Cargo handling and retention equipment;	FG	Nil
Airstairs.	FG	Nil
11.8 Fire protection (ATA26)		
(a)		
Fire and smoke detection and warning systems;	BC	ED
Fire extinguishing systems;	BC	ED
System tests;	BC	ED
(b)		

CASA module Examination subjects	CASA Mechanical Basics exams equivalent	CASA avionics basics exams equivalent
Portable fire extinguisher.	BC	ED
11.9 Flight controls (ATA27)		
Primary controls: aileron, elevator, rudder	BB	QB
Trim tabs;	BB	QB
High-lift devices;	BB	QB
System operation: manual;	BB	QB
Gust locks;	BB	QB
Balancing and rigging;	BB	Nil
Stall warning system.	BB	Nil
11.10 Fuel systems (ATA28)		
System layout;	FA	Nil
Fuel tanks;	FA	Nil
Supply systems;	FA	Nil
Cross-feed and transfer;	FA	Nil
Indications and warnings;	FA	IA
Refuelling and defuelling.	FA	Nil
11.11 Hydraulic power (ATA29)		
System layout;	FF	Nil
Hydraulic fluids;	FF	Nil
Hydraulic reservoirs and accumulators;	FF	Nil
Pressure generation: electric, mechanical;	FF	Nil
Filters;	FF	Nil
Pressure control;	FF	Nil
Power distribution;	FF	Nil
Indication and warning systems.	FF	IA
11.12 Ice and rain protection (ATA30)		
Ice formation, classification and detection;	FG	ED

CASA module Examination subjects	CASA Mechanical Basics exams equivalent	CASA avionics basics exams equivalent
De-icing systems: electrical, hot air, pneumatic and chemical;	FG	ED
Probe and drain heating;	FG	ED
Wiper systems	FG	Nil
11.13 Landing gear (ATA32)		
Construction, shock absorbing;	FG	Nil
Extension and retraction systems: normal and emergency;	FG	Nil
Indications and warning;	FG	EB
Wheels, brakes, antiskid and autobraking;	FG	ED
Tyres;	FA	Nil
Steering;	FF	Nil
Air-ground sensing.	FG	EB
11.14 Lights (ATA33)		
External: navigation, anti-collision, landing, taxiing, ice	Nil	EB
Internal: cabin, cockpit, cargo;	Nil	EB
Emergency.	Nil	EB
11.15 Oxygen (ATA35)		
System layout: cockpit, cabin;	FG	IZ
Sources, storage, charging and distribution;	FG	IZ
Supply regulation	FG	IZ
Indications and warnings.	FG	IZ
11.16 Pneumatic and vacuum (ATA36)		
System layout;	FM IM	IM
Sources: engine/APU, compressors, reservoirs, ground supply;	FF	Nil
Pressure and vacuum pumps;	FM	Nil
Pressure control;	FM IM	IM
Distribution;	FM IM	Nil

CASA module Examination subjects	CASA Mechanical Basics exams equivalent	CASA avionics basics exams equivalent
Indications and warnings;	FM IM	IM
Interfaces with other systems.	FM IM	Nil
11.17 Water and waste (ATA38)		
Water system layout, supply, distribution, servicing and draining;	FG	Nil
Toilet system layout, flushing and servicing;	Nil	Nil
Corrosion aspects.	FG	Nil

Module 12 Helicopter aerodynamics, structures and systems (B1.3 & B1.4)

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
12.1 Theory of flight — rotary wing aerodynamics		
Terminology;	FI	Nil
Effects of gyroscopic precession;	FI	IH
Torque reaction and directional control;	FI	Nil
Dissymmetry of lift, blade tip stall;	FI	IH
Translating tendency and its correction;	FI	Nil
Coriolis effect and compensation;	FI	IH
Vortex ring state, power settling, overpitching;	FI	IH
Auto-rotation;	FI	IH
Ground effect.	FI	IH
12.2 Flight control systems		
Cyclic control;	FI	IH
Collective control;	FI	IH
Swashplate;	FI	Nil
Yaw control: Anti-torque control, tail rotor, bleed air;	FI	IH
Main rotor head: design and operation features;	FI	Nil
Blade dampers: function and construction;	FI	Nil
Rotor blades: main and tail rotor blade construction and attachment;	FI	Nil
Trim control, fixed and adjustable stabilisers;	FI	Nil
System operation: manual, hydraulic, electrical and fly-by-wire;	FI	Nil
Artificial feel;	FI	Nil
Balancing and rigging.	FI	Nil
12.3 Blade tracking and vibration analysis		
Rotor alignment;	FI	Nil

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Main and tail rotor tracking;	FI or FR	Nil
Static and dynamic balancing;	FI	Nil
Vibration types, vibration reduction methods;	FI	Nil
Ground resonance.	FI	IH
12.4 Transmissions		
Gearboxes, main and tail rotors;	FI	Nil
Clutches, freewheel units and rotor brake.	FI	Nil
12.5 Airframe structures		
(a)		
Airworthiness requirements for structural strength;	FI	Nil
Structural classification, primary, secondary and tertiary;	FI	Nil
Fail safe, safe life, damage tolerance concepts;	FI	Nil
Zonal and station identification systems;	FI	Nil
Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue;	FI	Nil
Drains and ventilation provisions;	FI	Nil
System installation provisions;	FI	Nil
Lightning strike protection provision;	FG	Nil
(b)		
Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning and anti-corrosive protection;	FI	Nil
Pylon, stabiliser and undercarriage attachments;	FI	Nil
Seat installation;	FI	Nil
Doors: construction, mechanisms, operation and safety devices;	FI	Nil
Windows and windscreen construction;	FI	Nil
Fuel storage;	FR	Nil

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Firewalls;	FI	Nil
Engine mounts;	FI	Nil
Structure assembly techniques: riveting, bolting, bonding;	FI	Nil
Methods of surface protection, such as chromating, anodising, painting;	FI	Nil
Surface cleaning;	FI	Nil
Airframe symmetry: methods of alignment and symmetry checks.	FI	Nil
12.6 Air-conditioning (ATA21)		
12.6.1 Air supply		
Sources of air supply including engine bleed and ground cart.	FM	ED
12.6.2 Air-conditioning		
Air-conditioning systems;	FM	EB & ED
Distribution systems;	FM	EB & ED
Flow and temperature control systems;	FM	EB & ED
Protection and warning devices.	FM	IM
12.7 Instruments and avionic systems		
12.7.1 Instrument systems (ATA31)		
Pitot static: altimeter, air speed indicator, vertical speed indicator;	BC	IA
Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator;	BC	IZ
Compasses: direct reading, remote reading;	BC	IZ
Vibration indicating systems — HUMS;	Nil	Nil
Glass cockpit;	Nil	IZ
Other aircraft system indication.	Nil	IZ
12.7.2 Avionic systems		
Fundamentals of system layouts and operation of:		

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Auto flight (ATA22);	BC	IF
Communications (ATA23);	Nil	WZ
Navigation Systems (ATA34).	Nil	WC & WD & WE & WJ
12.8 Electrical power (ATA24)		
Batteries installation and operation;	BC	EB
DC power generation, AC power generation;	Nil	QD
Emergency power generation;	Nil	Nil
Voltage regulation, circuit protection;	BC	ED
Power distribution;	BC	ED
Inverters, transformers, rectifiers;	Nil	ED
External and ground power.	Nil	Nil
12.9 Equipment and furnishings (ATA25)		
(a)		
Emergency equipment requirements;	FI	Nil
Seats, harnesses and belts;	FI	Nil
Lifting systems;	FI	Nil
(b)		
Emergency flotation systems;	FI	Nil
Cabin layout, cargo retention;	Nil	Nil
Equipment layout;	Nil	Nil
Cabin furnishing installation.	Nil	Nil
12.10 Fire protection (ATA26)		
Fire and smoke detection and warning systems;	BC	ED
Fire extinguishing systems;	BC	ED
System tests.	BC	ED
12.11 Fuel systems (ATA28)		

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
System layout;	FR FA	Nil
Fuel tanks;	FA	Nil
Supply systems;	FA	Nil
Dumping, venting and draining;	FA	Nil
Cross-feed and transfer;	FA	Nil
Indications and warnings;	FA FR	IA
Refuelling and defuelling.	FA	Nil
12.12 Hydraulic power (ATA29)		
System layout;	FF	Nil
Hydraulic fluids;	FF	Nil
Hydraulic reservoirs and accumulators;	FF	Nil
Pressure generation: electric, mechanical, pneumatic;	FF	Nil
Emergency pressure generation;	FF	Nil
Pressure control;	FF	Nil
Power distribution;	FF	Nil
Indication and warning systems;	FF	IA
Interface with other systems.	FF	Nil
12.13 Ice and rain protection (ATA30)		
Ice formation, classification and detection;	FR	ED
Anti-icing and de-icing systems: electrical, hot air and chemical;	FR	ED
Rain repellent and removal;	FR	Nil
Probe and drain heating.	Nil	ED
12.14 Landing gear (ATA32)		
Construction, shock absorbing;	FI	Nil
Extension and retraction systems: normal and emergency;	FI	Nil
Indications and warning;	FI	EB

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Wheels, tyres, brakes;	FI	ED
Steering;	FI	Nil
Skids, floats.	FI	Nil
12.15 Lights (ATA33)		
External: navigation, landing, taxiing, ice;	Nil	EB
Internal: cabin, cockpit, cargo; emergency.	Nil	EB
12.16 Pneumatic and vacuum (ATA36)		
System layout;	Nil	IA
Sources: engine, compressors, reservoirs, ground supply;	FF	Nil
Pressure control;	IM	IA
Distribution;	Nil	IA
Indications and warnings;	IM	IA
Interfaces with other systems.	FF	Nil
12.17 Integrated modular avionics (ATA42)		
Functions that may be typically integrated in the integrated modular avionic (IMA) modules include: 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;	Nil	Nil
Core system;	Nil	Nil
Network components.	Nil	Nil
12.18 On-board maintenance systems (ATA45)		
Central maintenance computers;	Nil	Nil
Data loading system;	Nil	Nil
Electronic library system;	Nil	Nil
Printing;	Nil	Nil

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Structure monitoring (damage tolerance monitoring).	Nil	Nil
12.19 Information systems (ATA46)		
The units and components which furnish a means of storing, updating and retrieving digital information, traditionally provided on paper, microfilm or microfiche. These include units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. These do not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display.	Nil	Nil
Typical examples include: air traffic and information management systems; network server system; aircraft general information system; flight deck information system; maintenance information system; passenger cabin information system; miscellaneous information system.	Nil	Nil

Module 13 Aircraft structures and systems (B2)

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
13.1 Theory of flight		
(a) Aeroplane aerodynamics and flight controls		
Operation and effect of:		
· roll control: ailerons and spoilers;	BB	QB
· pitch control: elevators, stabilators, variable incidence stabilisers and canards;	BB	QB
· yaw control, rudder limiters;	BB	QB
Control using elevons, ruddervators;	BB	QB
Highlift devices: slots, slats, flaps;	BB	QB
Drag inducing devices: spoilers, lift dumpers, speed brakes;	BB	QB
Operation and effect of trim tabs, servo tabs, control surface bias;	BB	QB
(b) High speed flight		
Speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, critical Mach number;	BB	QB
(c) Rotary wing aerodynamics		
Terminology;		
Operation and effect of cyclic, collective and anti-torque controls.	FI	IH
13.2 Structures — general concepts		
(a)		
Fundamentals of structural systems;	FG	Nil
(b)		
Zonal and station identification systems; electrical bonding;	BA or FG	QB
Lightning strike protection provision.	FG	Nil
13.3 Autoflight (ATA22)		
Fundamentals of automatic flight control including working principles and current terminology;	Nil	IF or IH
Command signal processing;	Nil	IF

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Modes of operation: roll,	Nil	IF
pitch	Nil	IF
and yaw channels;Yaw dampers;	Nil	IF
Stability augmentation system in helicopters;	Nil	IH
Automatic trim control;	Nil	IF
Autopilot navigation aids interface;	Nil	IF
Autothrottle systems;	Nil	Nil
Automatic landing systems: principles and categories, modes of operation, approach, glide slope, land, go-around, system monitors and failure conditions.	Nil	IF
13.4 Communication and navigation (ATA23/34)		
Fundamentals of radio wave propagation, antennas, transmission lines, communication, receiver and transmitter.	Nil	WA
Working principles of following systems:		
· Very high frequency (VHF) communication;	Nil	WZ
· High frequency (HF) communication;	Nil	WZ
· Audio;	Nil	WB
· Emergency locator transmitters;	Nil	WZ
· Cockpit voice recorder;	Nil	WB
· Very high frequency omnidirectional range (VOR);	Nil	WD
· Automatic direction finding (ADF);	Nil	WC
· Instrument landing system (ILS);	Nil	WE
· Microwave landing system (MLS);	Nil	Nil
· Flight director systems;	Nil	IZ
· Distance measuring equipment (DME);	Nil	WJ
· Doppler navigation;	Nil	WK
· Area navigation, RNAV systems;	Nil	Nil
· Flight management systems;	Nil	IZ

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
· Global positioning system (GPS), Global navigation satellite systems (GNSS);	Nil	WL
· Inertial navigation system;	Nil	IK
· Air traffic control transponder, secondary surveillance radar;	Nil	WG
· Traffic alert and collision avoidance system (TCAS);	Nil	Nil
· Weather avoidance radar;	Nil	WF
· Radio altimeter;	Nil	WI
· ARINC communication and reporting.	Nil	Nil
13.5 Electrical power (ATA24)		
Batteries installation and operation;	BC	EB
DC power generation;	BC	EB
AC power generation;	Nil	EB
Emergency power generation;	Nil	Nil
Voltage regulation;	BC	EB
Power distribution;	BC	ED
Inverters, transformers, rectifiers;	Nil	ED
Circuit protection;	BC	ED
External and ground power.	Nil	Nil
13.6 Equipment and furnishings (ATA25)		
Electronic emergency equipment requirements;	Nil	Nil
Cabin entertainment equipment.	Nil	Nil
13.7 Flight controls (ATA27)		
(a)		
Primary controls: aileron, elevator, rudder, spoiler;	BB	QB
Trim control;	BB	QB
Active load control;	BB	QB
High lift devices;	BB	QB

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Lift dump, speed brakes;	BB	QB
System operation: manual, hydraulic, pneumatic;	BB	Nil
Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks;	BB	QB
Stall protection systems;	BB	QB
(b)		
System operation: electrical, fly-by-wire.	Nil	IF
13.8 Instrument systems (ATA31)		
Classification;		
Atmosphere;	Nil	IA
Terminology;	Nil	IA
Pressure measuring devices and systems;	Nil	IA
Pitot static systems;	BC	IA
Altimeters;	BC	IA
Vertical speed indicators;	BC	IA
Airspeed indicators;	BC	IA
Machmeters;	Nil	IA
Altitude reporting and alerting systems;	Nil	IA
Air data computers;	Nil	IA
Instrument pneumatic systems;	Nil	IA
Direct reading pressure and temperature gauges;	Nil	IA
Temperature indicating systems;	Nil	IA
Fuel quantity indicating systems;	FA	IA
Gyroscopic principles;	Nil	IZ
Artificial horizons;	BC	IZ
Slip indicators;	BC	IZ
Directional gyros;	Nil	IZ
Ground proximity warning systems;	Nil	IZ

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Compass systems;	BC	IZ
Flight data recording systems;	Nil	IZ
Electronic flight instrument systems;	Nil	IZ
Instrument warning systems including master warning systems and centralised warning panels;	Nil	Nil
Stall warning systems and angle of attack indicating systems;	Nil	Nil
Vibration measurement and indication.	Nil	IA
13.9 Lights (ATA33)		
External: navigation, landing, taxiing, ice;	Nil	EB
Internal: cabin, cockpit, cargo;	Nil	EB
Emergency.	Nil	EB
13.10 On-board maintenance systems (ATA45)		
Central maintenance computers;	Nil	Nil
Data loading system;	Nil	Nil
Electronic library system;	Nil	Nil
Printing;	Nil	Nil
Structure monitoring (damage tolerance monitoring).	Nil	Nil
13.11 Air-conditioning and cabin pressurisation (ATA21)		
13.11.1 Air supply		
Sources of air supply including engine bleed, APU and ground cart.	FM	ED
13.11.2 Air-conditioning		
Air-conditioning systems;	FM	ED & EB
Air cycle and vapour cycle machines;	FM	ED & EB
Distribution systems;	FM	ED & EB
Flow, temperature and humidity control system.	FM	ED & EB
13.11.3 Pressurisation		

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Pressurisation systems;	IM	IM
Control and indication including control and safety valves;	IM	IM
Cabin pressure controllers.	IM	IM
13.11.4 Safety and warning devices		
Protection and warning devices.	IM	IM
13.12 Fire protection (ATA26)		
(a)		
Fire and smoke detection and warning systems;	BC	ED
Fire extinguishing systems;	BC	ED
System tests;	BC	ED
(b)		
Portable fire extinguisher.	BC	ED
13.13 Fuel systems (ATA28)		
System layout;	FA	Nil
Fuel tanks;	FA	Nil
Supply systems;	FA	Nil
Dumping, venting and draining;	FA	Nil
Cross-feed and transfer;	FA	Nil
Indications and warnings;	FA	IA
Refuelling and defuelling;	FA	Nil
Longitudinal balance fuel systems.	FA	Nil
13.14 Hydraulic power (ATA29)		
System layout;	FF	Nil
Hydraulic fluids;	FF	Nil
Hydraulic reservoirs and accumulators;	FF	Nil
Pressure generation: electrical, mechanical, pneumatic;	FF	Nil
Emergency pressure generation;	FF	Nil

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Filters;	FF	Nil
Pressure control;	FF	Nil
Power distribution;	FF	Nil
Indication and warning systems;	FF	IA
Interface with other systems.	FF	Nil
13.15 Ice and rain protection (ATA30)		
Ice formation, classification and detection;	FG	ED
Anti-icing systems: electrical, hot air and chemical;	FG	ED
De-icing systems: electrical, hot air, pneumatic and chemical;	FG	ED
Rain repellent;	FG	Nil
Probe and drain heating;	FG	ED
Wiper systems.	FG	Nil
13.16 Landing gear (ATA32)		
Construction, shock absorbing;	FA	Nil
Extension and retraction systems: normal and emergency;	FG	Nil
Indications and warnings;	FG	EB
Wheels, brakes, antiskid and autobraking;	FA	ED
Tyres;	FA	Nil
Steering;	FA	Nil
Air-ground sensing.	FG	Nil
13.17 Oxygen (ATA35)		
System layout: cockpit, cabin;	FG	IZ
Sources, storage, charging and distribution;	FG	IZ
Supply regulation;	FG	IZ
Indications and warnings.	FG	IZ
13.18 Pneumatic/vacuum (ATA36)		
System layout;	BC	IA

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Sources: engine/APU, compressors, reservoirs, ground supply;	BC	IA
Pressure control;	IM	IA
Distribution;	FM	Nil
Indications and warnings;	IM	IM
Interfaces with other systems.	IM	Nil
13.19 Water/waste (ATA38)		
Water system layout, supply, distribution, servicing and draining;	FG	Nil
Toilet system layout, flushing and servicing.	Nil	Nil
13.20 Integrated modular avionics (ATA42)		
Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others: 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;	Nil	Nil
Core system;	Nil	Nil
Network components.	Nil	Nil
13.21 Cabin systems (ATA44)		
The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (cabin intercommunication data system) and between the aircraft cabin and ground stations (cabin network service). These include voice, data, music and video transmissions.	Nil	Nil
The cabin intercommunication data system provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRUs and they are typically operated via flight attendant panels.	Nil	Nil
The cabin network service typically consists on a server, typically interfacing with, among others, the following systems: data/radio communication, in-flight entertainment system.	Nil	Nil

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
The cabin network service may host functions such as:	Nil	Nil
· access to pre-departure/departure reports	Nil	Nil
· e-mail/intranet/internet access	Nil	Nil
· passenger database	Nil	Nil
· cabin core system	Nil	Nil
· in-flight entertainment system	Nil	Nil
· external communication system	Nil	Nil
· cabin monitoring system	Nil	Nil
· cabin mass memory system	Nil	Nil
· miscellaneous cabin system.	Nil	Nil
13.22 Information systems (ATA46)		
The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. These include units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. These do not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display.	Nil	Nil
Typical examples include: air traffic and information management systems; network server systems; aircraft general information system; flight deck information system; maintenance information system; passenger cabin information system; miscellaneous information system.	Nil	Nil

Module 14 Propulsion - avionic systems (B2)

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
14.1 Turbine engines		
(a)		
Constructional arrangement and operation of turbojet, turbofan, turbo shaft and turbopropeller engines;	GG	Nil
(b)		
Electronic engine control and fuel metering systems (FADEC).	GH	Nil
14.2 Engine indicating systems		
Exhaust gas temperature and interstage turbine temperature systems;	GH	IA
Engine speed;	GH	IA
Engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems;	GH	IA
Oil pressure and temperature;	GH	IA
Fuel pressure, temperature and flow;	GH	IA
Manifold pressure;	BC	IA
Engine torque;	GH	IA
Propeller speed.	Nil	IA
14.3 Starting and ignition systems		
Operation of engine start systems and components;	GH	EB
Ignition systems and components;	GH	EB
Maintenance safety requirements.	GH	EB

Module 15 Gas turbine engines (B1.1 & B1.3)

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
15.1 Fundamentals		
Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle;	GG	Nil
The relationship between force, work, power, energy, velocity, acceleration;	GG	Nil
Constructional arrangement and operation of turbojet, turbofan, turbo shaft, turboprop.	GG	Nil
15.2 Engine performance		
Gross thrust, net thrust, choked nozzle thrust, thrust distribution, resultant thrust, thrust horsepower, equivalent shaft horsepower, specific fuel consumption;	GG	Nil
Engine efficiencies;	GG	Nil
By-pass ratio and engine pressure ratio;	GG	Nil
Pressure, temperature and velocity of the gas flow;	GG	Nil
Engine ratings, static thrust, influence of speed, altitude and hot climate, flat rating, limitations.	GG	Nil
15.3 Inlet		
Compressor inlet ducts;	GG	Nil
Effects of various inlet configurations;	GG	Nil
Ice protection.	GG	Nil
15.4 Compressors		
centrifugal types;	GG	Nil
Axial and	GG	Nil
Constructional features and operating principles and applications;	GG	Nil
Fan balancing;	GH	Nil
Operation;	GG	Nil
Causes and effects of compressor stall and surge;	GG	Nil
Methods of airflow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades;	GG	Nil

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Compressor ratio.	GG	Nil
15.5 Combustion section		
Constructional features and principles of operation.	GG	Nil
15.6 Turbine section		
Operation and characteristics of different turbine blade types;	GG	Nil
Blade to disk attachment;	GG	Nil
Nozzle guide vanes;	GG	Nil
Causes and effects of turbine blade stress and creep.	GG	Nil
15.7 Exhaust		
Constructional features and principles of operation;	GG	Nil
Convergent, divergent and variable area nozzles;	GG	Nil
Engine noise reduction;	GG	Nil
Thrust reversers.	GG	Nil
15.8 Bearings and seals		
Constructional features and principles of operation.	GG	Nil
15.9 Lubricants and fuels		
Properties and specifications;	GG	Nil
Fuel additives;	GG	Nil
Safety precautions.	GG	Nil
15.10 Lubrication systems		
System operation and layout and components.	GH	Nil
15.11 Fuel systems		
Operation of engine control and fuel metering systems including	GH	Nil
: electronic engine control (FADEC), systems layout and components.	GH	Nil
15.12 Air systems		

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Operation of engine air distribution and anti-ice control systems, including internal cooling, sealing and external air services.	GH	Nil
15.13 Starting and ignition systems		
Operation of engine start systems and components;	GH	EB
Ignition systems and components;	GH	EB
Maintenance safety requirements.	GH	EB
15.14 Engine indication systems		
Exhaust gas temperature and interstage turbine temperature;	GH	IA
Engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems;	GH	IA
Oil pressure and temperature;	GH	IA
Fuel pressure and flow;	GH	IA
Engine speed;	GH	IA
Vibration measurement and indication;	GH	IA
Torque;	GH	IA
Power.	GH	IA
15.15 Power augmentation systems		
Operation and applications;	GH	Nil
Water injection, water methanol;	GH	Nil
Afterburner systems.	GH	Nil
15.16 Turbo-prop engines		
Gas coupled and free turbine and gear coupled turbines;	GG	Nil
Reduction gears;	GH	Nil
Integrated engine and propeller controls;	GH	Nil
Over speed safety devices.	GH	Nil
15.17 Turbo-shaft engines		
Arrangements drive systems, reduction gearing, couplings,	GH	Nil

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
control systems.		
15.18 Auxiliary power units (APUs)		
Purpose, operation, protective systems.	GH	Nil
15.19 Powerplant installation		
Configuration of fire walls, cowlings, acoustic panels engine mounts, anti-vibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.	GH	Nil
15.20 Fire protection systems		
Operation of detection and extinguishing systems.	BC	EB
15.21 Engine monitoring and ground operation		
Procedures for starting and ground run-up;	GH	Nil
Interpretation of engine power output and parameters;	GH	Nil
Trend (including oil analysis, vibration and baroscope) monitoring;	GH	Nil
Inspection of engine and components to criteria, tolerances and data specified by engine manufacturer;	GH	Nil
Compressor washing and cleaning;	GH	Nil
Foreign object damage.	GH	Nil
15.22 Engine storage and preservation		
Preservation and depreservation for the engine and accessories and systems.	GH	Nil

Module 16 Piston engines (B1.2 & B1.4)

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
16.1 Fundamentals		
Mechanical, thermal and volumetric efficiencies;	GA	Nil
Operating principles: 2 stroke, 4 stroke, otto and diesel;	GA	Nil
Piston displacement and compression ratio;	GA	Nil
Engine configuration and firing order.	GA	Nil
16.2 Engine performance		
Power calculation and measurement;	GA	Nil
Factors affecting engine power;	GA	Nil
Mixtures and leaning, pre-ignition.	GA	Nil
16.3 Engine construction		
Crankcase, crankshaft, camshafts, sumps;	GA	Nil
Accessory gearbox;	GA	Nil
Cylinder and piston assemblies;	GA	Nil
Connecting rods, inlet and exhaust manifolds;	GA	Nil
Valve mechanisms;	GA	Nil
Propeller reduction gearboxes.	GA	Nil
16.4 Engine fuel systems		
16.4.1 Carburettors		
Types, construction and principles of operation;	GB	Nil
Icing and heating.	GB	Nil
16.4.2 Fuel injection systems		
Types, construction and principles of operation.	GB	Nil
16.4.3 Electronic engine control		
Operation of engine control and fuel metering systems including: electronic engine control (FADEC), systems layout and components.	Nil	Nil
16.5 Starting and ignition systems		

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Starting systems, pre-heat systems;	GB	EB
Magneto types, construction and principles of operation;	GB	EB
Ignition harnesses, sparkplugs;	GB	EB
Low and high-tension systems.	GB	EB
16.6 Induction, exhaust and cooling systems		
Construction and operation of induction systems, including alternate air systems;	GB	Nil
Exhaust systems, engine cooling systems — air and liquid.	GB	Nil
16.7 Supercharging and turbo charging		
Principles and purpose of supercharging and its effects on engine parameters;	GF	Nil
Construction and operation of supercharging and turbo charging systems;	GF	Nil
System terminology;	GF	Nil
Control systems;	GF	Nil
System protection.	GF	Nil
16.8 Lubricants and fuels		
Properties and specifications;	GA	Nil
Fuel additives;	GA	Nil
Safety precautions.	GA	Nil
16.9 Lubrication systems		
System operation and layout and components.	GA	Nil
16.10 Engine indication systems		
Engine speed;	Nil	IA
Cylinder head temperature;	Nil	IA
Coolant temperature;	Nil	IA
Oil pressure and temperature;	Nil	IA
Exhaust gas temperature;	Nil	IA
Fuel pressure and flow;	Nil	IA

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Manifold pressure.	Nil	IA
16.11 Powerplant 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.	GD	Nil
16.12 Engine monitoring and ground operation		
Procedures for starting and ground run-up;	GD	Nil
Interpretation of engine power output and parameters;	GD	Nil
Inspection of engine and components: criteria, tolerances and data specified by engine manufacturer.	GD	Nil
16.13 Engine storage and preservation		
Preservation and depreservation for the engine and accessories and systems.	GD	Nil

Module 17 Propeller (B1.1 & B1.2)

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
17.1 Fundamentals		
Blade element theory;	GC	Nil
High and low blade angle, reverse angle, angle of attack, rotational speed;	GC	Nil
Propeller slip;	GC	Nil
Aerodynamic, centrifugal, and thrust forces;	GC	Nil
Torque;	GC	Nil
Relative airflow on blade angle of attack;	GC	Nil
Vibration and resonance.	GC	Nil
17.2 Propeller construction		
Construction methods and materials used in wooden, composite and metal propellers;	GC	Nil
Blade station, blade face, blade shank, blade back and hub assembly;	GC	Nil
Fixed pitch, controllable pitch, constant speeding propeller;	GC	Nil
Propeller and spinner installation.	GC	Nil
17.3 Propeller pitch control		
Speed control and pitch change methods, mechanical and electrical and electronic;	GC	Nil
Feathering and reverse pitch;	GC	Nil
Overspeed protection.	GC	Nil
17.4 Propeller synchronising		
Synchronising and synchrophasing equipment.	GC	ED
17.5 Propeller ice protection		
Fluid and electrical de-icing equipment.	GC	ED
17.6 Propeller maintenance		
Static and dynamic balancing;	GC	Nil
Blade tracking;	GC	Nil

CASA module Examinations subjects	CASA mech basics exams equivalent	CASA avionic basics exams equivalent
Assessment of blade damage, erosion, corrosion, impact damage, delamination;	GC	Nil
Propeller treatment and repair schemes;	GC	Nil
Propeller engine running.	GC	Nil
17.7 Propeller storage and preservation		
Propeller preservation and depreservation.	GC	Nil