

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

1. KNOWLEDGE LEVELS — CATEGORY A, B1, B2 AND C AIRCRAFT MAINTENANCE LICENSE.	
<p>Basic knowledge for categories A, B1 and B2 are indicated by the allocation of knowledge levels indicators (1, 2 or 3) against each applicable subject. Category C applicants must meet either the category B1 or the category B2 basic knowledge levels. The knowledge level indicators are defined as follows:</p>	
LEVEL 1	<p>A familiarization with the principal elements of the subject.</p> <p>Objectives: The applicant should be familiar with the basic elements of the subject. The applicant should be able to give a simple description of the whole subject, using common words and examples. The applicant should be able to use typical terms.</p>
LEVEL 2	<p>A general knowledge of the theoretical and practical aspects of the subject.</p> <p><i>An ability to apply that knowledge.</i></p> <p>Objectives: The applicant should be able to understand the theoretical fundamentals of the subject. The applicant should be able to give a general description of the subject using, as appropriate, typical examples. The applicant should be able to use mathematical formulae in conjunction with physical laws describing the subject. The applicant should be able to read and understand sketches, drawings and schematics describing the subject. The applicant should be able to apply his knowledge in a practical manner using detailed procedures.</p>
LEVEL 3	<p>A detailed knowledge of the theoretical and practical aspects of the subject.</p> <p><i>A capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.</i></p> <p>Objectives: The applicant should know the theory of the subject and interrelationships with other subjects.</p> <p>The applicant should be able to give a detailed description of the subject using theoretical fundamentals and specific examples. The applicant should understand and be able to use mathematical formulae related to the subject. The applicant should be able to read, understand and prepare sketches, simple drawings and schematics describing the subject. The applicant should be able to apply his knowledge in a practical manner using manufacturer's instructions. The applicant should be able to interpret results from various sources and measurements and apply corrective action where appropriate.</p>

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

Part-66 Modules	A or B1 aeroplane with:		A or B1 helicopter with:		B2	Question Numbers for the PART-66 Appendix I Modules		
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	Avionics	Category A	Category B1	Category B2
1	X	X	X	X	X	16 multi-choice & 0 essay Qs. Time allowed 20 minutes.	30[32] multi-choice & 0 essay Qs. Time allowed 40 minutes.	30[32] multi-choice & 0 essay Q. Time allowed 40 minutes.
2	X	X	X	X	X	30[32] multi-choice & 0 essay Qs. Time allowed 40 minutes.	50[52] multi-choice & 0 essay Qs. Time allowed 65 minutes.	50[52] multi-choice & 0 essay Qs. Time allowed 65 minutes.
3	X	X	X	X	X	10[20] multi-choice & 0 essay Qs. Time allowed 25 minutes.	50[52] multi-choice & 0 essay Qs. Time allowed 65 minutes.	50[52] multi-choice & 0 essay Qs. Time allowed 65 minutes.
4	X	X	X	X	X	None.	20 multi-choice & 0 essay Qs. Time allowed 25 minutes.	40 multi-choice & 0 essay Qs. Time allowed 50 minutes.
5	X		X		X	16 multi-choice & 0 essay Qs. Time allowed 20 minutes.	B1.1 & B1.3 40 multi-choice & 0 essay Qs. Time allowed 50 minutes.	70[72] multi-choice & 0 essay Qs. Time allowed 90 minutes.
		X					B1.2 & B1.4 20 multi-choice & 0 essay Qs. Time allowed 25 minutes.	
6	X	X	X	X	X	50[52] multi-choice & 0 essay Qs. Time allowed 65 minutes.	70[72] multi-choice & 0 essay Qs. Time allowed 90 minutes.	60 multi-choice & 0 essay Qs. Time allowed 75 minutes.
7	X	X	X	X	X	70[72] multi-choice & 2 essay Qs. Time allowed 90 minutes plus 40 minutes.	80 multi-choice & 2 essay Qs. Time allowed 100 minutes plus 40 minutes.	60 multi-choice & 2 essay Qs. Time allowed 75 minutes plus 40 minutes.
8	X	X	X	X	X	20 multi-choice & 0 essay Qs. Time allowed 25 minutes.	20 multi-choice & 0 essay Qs. Time allowed 25 minutes.	20 multi-choice & 0 essay Qs. Time allowed 25 minutes.
9	X	X	X	X	X	20 multi-choice & 1 essay question. Time allowed 25 minutes plus 20 minutes.	20 multi-choice & 1 essay question. Time allowed 25 minutes plus 20 minutes.	20 multi-choice & 1 essay question. Time allowed 25 minutes plus 20 minutes.
10	X	X	X	X	X	30[32] multi-choice & 1 essay question. Time allowed 40 minutes plus 20 minutes.	40 multi-choice & 1 essay question. Time allowed 50 minutes plus 20 minutes.	40 multi-choice & 1 essay question. Time allowed 50 minutes plus 20 minutes.
11a	X					100[108] multi-choice & 0 essay Qs. Time allowed 125 minutes.	130[140] multi-choice & 0 essay Qs. Time allowed 165 minutes.	None.
11b	CASA has not addressed	X				70 multi-choice & 0 essay Qs. Time allowed 90 minutes.	100 multi-choice & 0 essay Qs. Time allowed 125 minutes.	None.
12			X	X		90[100] multi-choice & 0 essay Qs. Time allowed 115 minutes.	115[128] multi-choice & 0 essay Qs. Time allowed 145 minutes.	None.
13					X	None.	None.	130[180] multi-choice & 0

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Part-66 Modules	A or B1 aeroplane with:		A or B1 helicopter with:		B2	Question Numbers for the PART-66 Appendix I Modules		
	Turbine engine(s)	Piston engine(s)	Turbine engine(s)	Piston engine(s)	Avionics	Category A	Category B1	Category B2
								essay Qs. Time allowed 165[225] minutes
14					X	None.	None.	25[24] multi-choice & 0 essay Qs. Time allowed 30 minutes
15	X		X			60 multi-choice & 0 essay Qs. Time allowed 75 minutes.	90[92] multi-choice & 0 essay Qs. Time allowed 115 minutes.	None.
16		X		X		10[52] multi-choice & 0 essay Qs. Time allowed 65 minutes.	70[72] multi-choice & 0 essay Qs. Time allowed 90 minutes.	None.
17	X	X				10[20] multi-choice & 0 essay Qs. Time allowed 25 minutes.	30[32] multi-choice & 0 essay Qs. Time allowed 40 minutes	None.

- Numbers in [-] are CASA numbers

CASA has added additional requirements to the modules when compared with the EASA Modules:

11.4.1 Air Supply,
 11.4.2 Air Conditioning,
 11.4.3 Pressurisation &
 11.4.4 Safety & Warning Devices
 11.19 Integrated Modular Avionics (ATA 42)
 11.20 Cabin Systems (ATA 44)
 11.21 Information Systems (ATA 46)
 12.17 Integrated Modular Avionics (ATA 42)

12.18 On-board maintenance systems (ATA 45)
 12.19 Information Systems (ATA 46)
 13.11 Air-conditioning and cabin pressurisation (ATA21)
 13.12 Fire Protection (ATA26)
 13.13 Fuel Systems (ATA28)
 13.14 Hydraulic power (ATA29)
 13.15 Ice & rain Protection (ATA30)
 13.16 Landing Gear (ATA32)

13.17 Oxygen (ATA 35)
 13.18 Pneumatic/vacuum (ATA36)
 13.19 Water/waste (ATA38)
 13.20 Integrated Modular Avionics (ATA 42)
 13.21 Cabin Systems (ATA44)
 13.22 Information Systems (ATA 46)
 14.3 Starting and ignition system

Atypical A, B1/2 training course durations that have EASA approvals.

A courses have a total duration of 282 training hours, plus 522 hours of practical training (804 total hours)

B1.1 and B1.3 courses have a total duration of 1440 training hours, plus 960 hours of practical training. (2400 total hours)

B1.2 and B1.4 courses have a total duration of 1398 training hours, plus 1002 hours of practical training. (2400total hours)

B2 courses have a total duration of 1442 training hours, plus 978 hours of practical training. (2420 total hours)

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
MODULE 1 — MATHEMATICS				
1.1 Arithmetic <i>Arithmetical terms & signs, methods of multiplication & division, fractions & decimals, factors & multiples, weights, measures & conversion factors, ratio & proportion, averages & percentages, areas & volumes, squares, cubes, square & cube roots.</i>	1	2	2	Nil
1.2 Algebra <i>(a) Evaluating simple algebraic expressions, addition, subtraction, multiplication & division, use of brackets, simple algebraic fractions;</i>	1	2	2	Nil
<i>(b) Linear equations & their solutions;</i> <i>Indices & powers, negative & fractional indices;</i> <i>Binary & other applicable numbering systems;</i> <i>Simultaneous equations & second degree equations with one unknown;</i> <i>Logarithms.</i>	—	1	1	Nil
<i>(a) Simple geometrical constructions;</i>	—	1	1	Nil
<i>(b) Graphical representation;</i> <i>nature & uses of graphs, graphs of equations/functions;</i>	2	2	2	Nil
<i>(c) Simple trigonometry;</i> <i>trigonometrical relationships, use of tables & rectangular & polar coordinates.</i>	—	2	2	Nil
MODULE 2 — PHYSICS				
2.1 Matter <i>Nature of matter: the chemical elements, structure of atoms, molecules;</i> <i>Chemical compounds;</i> <i>States: solid, liquid & gaseous;</i> <i>Changes between states.</i>	1	1	1	Nil
2.2 Mechanics 2.2.1 Statics <i>Forces, moments & couples, representation as vectors;</i> <i>Centre of gravity;</i> <i>Elements of theory of stress, strain & elasticity: tension, compression, shear & torsion;</i> <i>Nature & properties of solid, fluid & gas;</i> <i>Pressure & buoyancy in liquids (barometers).</i>	1	2	1	Nil
2.2.2 Kinetics <i>Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity);</i> <i>Rotational movement: uniform circular motion (centrifugal/centripetal forces);</i> <i>Periodic motion: pendular movement;</i> <i>Simple theory of vibration, harmonics & resonance;</i> <i>Velocity ratio, mechanical advantage & efficiency.</i>	1	2	1	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
2.2.3 Dynamics <i>(a) Mass: Force, inertia, work, power, energy (potential, kinetic & total energy), heat, efficiency;</i>	1	2	1	Nil
<i>(b) Momentum, conservation of momentum; Impulse; Gyroscopic principles; Friction: nature & effects, coefficient of friction (rolling resistance).</i>	1	2	2	Nil
2.2.4 Fluid dynamics <i>(a) Specific gravity & density;</i>	2	2	2	Nil
<i>(b) Viscosity, fluid resistance, effects of streamlining; Effects of compressibility on fluids; Static, dynamic & total pressure: Bernoulli's Theorem, venturi.</i>	1	2	1	Nil
2.3 Thermodynamics <i>(a) Temperature: thermometers & temperature scales: Celsius, Fahrenheit & Kelvin; Heat definition;</i>	2	2	2	Nil
<i>(b) Heat capacity, specific heat; Heat transfer: convection, radiation & conduction; Volumetric expansion; First & second law of thermodynamics; Gases: ideal gases laws; specific heat at constant volume & constant pressure, work done by expanding gas; Isothermal, adiabatic expansion & compression, engine cycles, constant volume & constant pressure, refrigerators & heat pumps; Latent heats of fusion & evaporation, thermal energy, heat of combustion.</i>	—	2	2	Nil
2.4 Optics (Light) <i>Nature of light; speed of light; Laws of reflection & refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses; Fibre optics.</i>	—	2	2	Nil
2.5 Wave Motion & Sound <i>Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves; Sound: speed of sound, production</i>	—	2	2	Nil
MODULE 3 — ELECTRICAL FUNDAMENTALS				
3.1 Electron Theory <i>Structure & distribution of electrical charges within: atoms, molecules, ions, compounds; Molecular structure of conductors, semiconductors & insulators.</i>	1	1	1	Nil
3.2 Static Electricity & Conduction <i>Static electricity & distribution of electrostatic charges; Electrostatic laws of attraction & repulsion; Units of charge, Coulomb's Law; Conduction of electricity in solids, liquids, gases & a vacuum.</i>	1	2	2	Nil
3.3 Electrical Terminology <i>The following terms, their units & factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.</i>	1	2	2	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
3.4 Generation of Electricity <i>Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism & motion.</i>	1	1	1	Nil
3.5 DC Sources of Electricity <i>Construction & basic chemical action of: primary cells, secondary cells, lead acid cells, nickel cadmium cells, other alkaline cells; Cells connected in series & parallel; Internal resistance & its effect on a battery; Construction, materials & operation of thermocouples; Operation of photo-cells.</i>	1	2	2	Nil
3.6 DC Circuits <i>Ohms Law, Kirchoff's Voltage & Current Laws; Calculations using the above laws to find resistance, voltage & current; Significance of the internal resistance of a supply.</i>	—	2	2	Nil
3.7 Resistance/Resistor <i>(a) Resistance & affecting factors; Specific resistance; Resistor colour code, values & tolerances, preferred values, wattage ratings; Resistors in series & parallel; Calculation of total resistance using series, parallel & series parallel combinations; Operation & use of potentiometers & rheostats; Operation of Wheatstone Bridge;</i>	—	2	2	Nil
<i>(b) Positive & negative temperature coefficient conductance; Fixed resistors, stability, tolerance & limitations, methods of construction; Variable resistors, thermistors, voltage dependent resistors; Construction of potentiometers & rheostats; Construction of Wheatstone Bridge.</i>	—	1	1	Nil
3.8 Power <i>Power, work & energy (kinetic & potential); Dissipation of power by a resistor; Power formula; Calculations involving power, work & energy.</i>	—	2	2	Nil
3.9 Capacitance/Capacitor <i>Operation & function of a capacitor; Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric & dielectric constant, working voltage, voltage rating; Capacitor types, construction & function; Capacitor colour coding; Calculations of capacitance & voltage in series & parallel circuits; Exponential charge & discharge of a capacitor, time constants; Testing of capacitors.</i>	—	2	2	Nil
3.10 Magnetism <i>(a) Theory of magnetism; Properties of a magnet; Action of a magnet suspended in the Earth's magnetic field; Magnetisation & demagnetisation;</i>	—	2	2	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Magnetic shielding: Various types of magnetic material; Electromagnets construction & principles of operation; Hand clasp rules to determine: magnetic field around current carrying conductor;</i>				
<i>(b) Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; Precautions for care & storage of magnets.</i>	—	2	2	Nil
3.11 Inductance/Inductor <i>Faraday's Law; Action of inducing a 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 & 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 & polarity determining rules; Back emf, self induction; Saturation point; Principle uses of inductors.</i>	—	2	2	Nil
3.12 DC Motor/Generator Theory <i>Basic motor & generator theory; Construction & purpose of components in DC generator; Operation of, & factors affecting output & direction of current flow in DC generators; Operation of, & factors affecting output power, torque, speed & direction of rotation of DC motors; Series wound, shunt wound & compound motors; Starter Generator construction.</i>	—	2	2	Nil
3.13 AC Theory <i>Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak to peak current values & calculations of these values, in relation to voltage, current & power; Triangular/Square waves; Single/3 phase principles.</i>	1	2	2	Nil
3.14 Resistive (R), Capacitive (C) & Inductive (L) Circuits <i>Phase relationship of voltage & current in L, C & R circuits, parallel, series & series parallel; Power dissipation in L, C & R circuits; Impedance, phase angle, power factor & current calculations; True power, apparent power & reactive power calculations.</i>	—	2	2	

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
3.15 Transformers <i>Transformer construction principles & operation;</i> <i>Transformer losses & methods for overcoming them;</i> <i>Transformer action under load & no-load conditions;</i> <i>Power transfer, efficiency, polarity markings;</i> <i>Calculation of line & phase voltages & currents;</i> <i>Calculation of power in a three phase system;</i> <i>Primary & Secondary current, voltage, turns ratio, power, efficiency;</i> <i>Auto transformers.</i>	—	2	2	Nil
3.16 Filters <i>Operation, application & uses of the following filters: low pass, high pass, b& pass, b& stop.</i>	—	1	1	Nil
3.17 AC Generators <i>Rotation of loop in a magnetic field & waveform produced;</i> <i>Operation & construction of revolving armature & revolving field type AC generators;</i> <i>Single phase, two phase & three phase alternators;</i> <i>Three phase star & delta connections advantages & uses;</i> <i>Permanent Magnet Generators.</i>	—	2	2	Nil
3.18 AC Motors <i>Construction, principles of operation & characteristics of: AC synchronous & induction motors both single & polyphase;</i> <i>Methods of speed control & direction of rotation;</i> <i>Methods of producing a rotating field: capacitor, inductor, shaded or split pole.</i>	—	2	2	Nil
MODULE 4. ELECTRONIC FUNDAMENTALS LEVEL				
4.1 Semiconductors 4.1.1 Diodes <i>(a) Diode symbols; Diode characteristics & properties;</i> <i>Diodes in series & parallel;</i> <i>Main characteristics & use of silicon controlled rectifiers (thyristors), light emitting diode, photo conductive diode, varistor, rectifier diodes;</i> <i>Functional testing of diodes.</i>	—	2	2	Nil
<i>(b) Materials, electron configuration, electrical properties;</i> <i>P & N type materials: effects of impurities on conduction, majority & minority characters;</i> <i>PN junction in a semiconductor, development of a potential across a PN junction in unbiased, forward biased & reverse biased conditions;</i> <i>Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation;</i> <i>Operation & function of diodes in the following circuits: clippers, clampers, full & half wave rectifiers, bridge rectifiers, voltage doublers & triplers;</i> <i>Detailed operation & characteristics of the following devices: silicon controlled rectifier (thyristor), light emitting diode, Schottky diode,</i>	—	—	2	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison	
	A	B1	B2	CASA Differences	
<i>photo conductive diode, varactor diode, varistor, rectifier diodes, Zener diode.</i>					
4.1.2 Transistors <i>(a) Transistor symbols; Component description & orientation; Transistor characteristics & properties.</i>	—	1	2	Nil	
<i>(b) Construction & operation of PNP & NPN transistors; Base, collector & emitter configurations; Testing of transistors; Basic appreciation of other transistor types & their uses; Application of transistors: classes of amplifier (A, B, C); Simple circuits including: bias, decoupling, feedback & stabilisation; Multistage circuit principles: cascades, push-pull, oscillators, multivibrators, flip-flop circuits.</i>	—	—	2	Nil	
4.1.3 Integrated Circuits <i>(a) Description & operation of logic circuits & linear circuits/operational amplifiers;</i>	—	1	—	Nil	
<i>(b) Description & operation of logic circuits & linear circuits; Introduction to operation & function of an operational amplifier used as: integrator, differentiator, voltage follower, comparator; Operation & amplifier stages connecting methods: resistive capacitive, inductive (transformer), inductive resistive (IR), direct; Advantages & disadvantages of positive & negative feedback.</i>	—	—	2	Nil	
4.2 Printed Circuit Boards <i>Description & use of printed circuit boards.</i>	—	1	2	Nil	
4.3 Servomechanisms <i>(a) Understanding of the following terms: Open & closed loop systems, feedback, follow up, analogue transducers; Principles of operation & use of the following synchro system components/features: resolvers, differential, control & torque, transformers, inductance & capacitance transmitters;</i>	—	1	—	Nil	
<i>(b) Understanding of the following terms: Open & closed loop, follow up, servomechanism, analogue, transducer, null, damping, feedback, deadband; Construction operation & use of the following synchro system components: resolvers, differential, control & torque, E & I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters; Servomechanism defects, reversal of synchro leads, hunting.</i>	—	—	2	Nil	
MODULE 5 DIGITAL TECHNIQUES ELECTRONIC INSTRUMENT SYSTEMS		1.1 1.3	1.2 1.4	EASA splits between B1 turbine and piston knowledge requirements	
5.1 Electronic Instrument Systems <i>Typical systems arrangements and cockpit layout of electronic instrument systems.</i>	1	2	2	3	Nil
5.2 Numbering Systems <i>Numbering systems: binary, octal and hexadecimal; Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa.</i>	—	1	—	2	CASA also applies to B1.2/4
5.3 Data Conversion <i>Analogue Data, Digital Data; Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types.</i>	—	1	—	2	CASA also applies to B1.2/4

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison	
	A	B1	B2	CASA Differences	
5.4 Data Buses <i>Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications.</i>	—	2	—	2	CASA also applies to B1.2/4
5.5 Logic Circuits <i>(a) Identification of common logic gate symbols, tables and equivalent circuits; Applications used for aircraft systems, schematic diagrams. Computer technology (as applied in aircraft systems).</i>	—	2	—	2	CASA also applies to B1.2/4 Computer Technology NA
<i>(b) Interpretation of logic diagrams.</i>	—	—	—	2	Nil
5.6 Basic Computer Structure <i>(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).</i>	1	2	—	—	CASA also applies to B1.2/4
<i>(b) Computer related terminology; Operation, layout and interface of the major components in a micro computer including their associated bus systems; Information contained in single and multiaddress instruction words; Memory associated terms; Operation of typical memory devices; Operation, advantages and disadvantages of the various data storage systems.</i>	—	—	—	2	Nil
5.7 Microprocessors <i>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.</i>	—	—	—	2	Nil
5.8 Integrated Circuits <i>Operation and use of encoders and decoders; Function of encoder types; Uses of medium, large and very large scale integration.</i>	—	—	—	2	Nil
5.9 Multiplexing <i>Operation, application and identification in logic diagrams of multiplexers and demultiplexers.</i>	—	—	—	2	Nil
5.10 Fibre Optics <i>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.</i>	—	1	1	2	Nil
5.11 Electronic Displays <i>Principles of operation of common types of displays used in modern aircraft, including Cathode Ray Tubes, Light Emitting Diodes and Liquid Crystal Display.</i>	—	2	—	2	CASA also applies to B1.2/4
5.12 Electrostatic Sensitive Devices <i>Special handling of components sensitive to electrostatic discharges; Awareness of risks and possible damage, component and personnel anti-static protection devices.</i>	—	2	2	2	CASA also applies to A (L1)

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

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	A	B1	B2	CASA Differences	
5.13 Software Management Control <i>Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programmes.</i>	—	2	1	2	CASA also applies L2 to B1.2/4
5.14 Electromagnetic Environment <i>Influence of the following phenomena on maintenance practices for electronic system: EMC-Electromagnetic Compatibility EMI-Electromagnetic Interference HIRF-High Intensity Radiated Field Lightning/lightning protection</i>	—	2	2	2	Nil
5.15 Typical Electronic/Digital Aircraft Systems <i>General arrangement of typical electronic/digital aircraft systems and associated BITE (Built In Test Equipment) testing such as: ACARS-ARINC Communication and Addressing and Reporting System ECAM-Electronic Centralised Aircraft Monitoring EFIS-Electronic Flight Instrument System EICAS-Engine Indication and Crew Alerting System FBW-Fly by Wire FMS-Flight Management System GPS-Global Positioning System IRS-Inertial Reference System TCAS-Traffic Alert Collision Avoidance System</i>	—	2	2	2	Nil
MODULE 6. MATERIALS & HARDWARE					
6.1 Aircraft Materials — Ferrous 1 <i>(a) Characteristics, properties & identification of common alloy steels used in aircraft; Heat treatment & application of alloy steels.</i>	1	2	1		Nil
<i>(b) Testing of ferrous materials for hardness, tensile strength, fatigue strength & impact resistance.</i>	—	1	1		Nil
6.2 Aircraft Materials — Non-Ferrous <i>(a) Characteristics, properties & identification of common non-ferrous materials used in aircraft; Heat treatment & application of non-ferrous materials;</i>	1	2	1		Nil
<i>(b) Testing of non-ferrous material for hardness, tensile strength, fatigue strength & impact resistance.</i>	—	1	1		Nil
6.3 Aircraft Materials — Composite & Non-Metallic 6.3.1 Composite & non-metallic other than wood & fabric <i>(a) Characteristics, properties & identification of common composite & non-metallic materials, other than wood, used in aircraft; Sealant & bonding agents;</i>	1	2	2		Nil
<i>(b) The detection of defects/deterioration in composite & non-metallic material; Repair of composite & non-metallic material.</i>	1	2	—		Nil
6.3.2 Wooden structures <i>Construction methods of wooden airframe structures;</i>	1	2	—		Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Characteristics, properties & types of wood & glue used in aeroplanes;</i> <i>Preservation & maintenance of wooden structure;</i> <i>Types of defects in wood material & wooden structures;</i> <i>The detection of defects in wooden structure;</i> <i>Repair of wooden structure.</i>				
6.3.3 Fabric covering <i>Characteristics, properties & types of fabrics used in aeroplanes;</i> <i>Inspections methods for fabric;</i> <i>Types of defects in fabric;</i> <i>Repair of fabric covering.</i>	1	2	—	Nil
6.4 Corrosion <i>(a) Chemical fundamentals;</i> <i>Formation by, galvanic action process, microbiological, stress;</i>	1	1	1	Nil
<i>(b) Types of corrosion & their identification;</i> <i>Causes of corrosion;</i> <i>Material types, susceptibility to corrosion.</i>	2	3	2	Nil
6.5 Fasteners 6.5.1 Screw threads <i>Screw nomenclature;</i> <i>Thread forms, dimensions & tolerances for standard threads used in aircraft;</i> <i>Measuring screw threads.</i>	2	2	2	Nil
6.5.2 Bolts, studs & screws <i>Bolt types: specification, identification & marking of aircraft bolts, international standards;</i> <i>Nuts: self locking, anchor, standard types;</i> <i>Machine screws: aircraft specifications;</i> <i>Studs: types & uses, insertion & removal;</i> <i>Self tapping screws, dowels.</i>	2	2	2	Nil
6.5.3 Locking devices <i>Tab & spring washers, locking plates, split pins, pal-nuts, wire locking, quick release fasteners, keys, circlips, cotter pins.</i>	2	2	2	Nil
6.5.4 Aircraft rivets <i>Types of solid & blind rivets: specifications & identification, heat treatment.</i>	1	2	1	Nil
6.6 Pipes & Unions <i>(a) Identification of, & types of rigid & flexible pipes & their connectors used in aircraft;</i>	2	2	2	Nil
<i>(b) Standard unions for aircraft hydraulic, fuel, oil, pneumatic & air system pipes.</i>	2	2	1	Nil
6.7 Springs <i>Types of springs, materials, characteristics & applications.</i>	—	2	1	CASA also applies to A (L1)
6.8 Bearings <i>Purpose of bearings, loads, material, construction;</i>	1	2	2	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Types of bearings & their application.</i>				
6.9 Transmissions <i>Gear types & their application; Gear ratios, reduction & multiplication gear systems, driven & driving gears, idler gears, mesh patterns; Belts & pulleys, chains & sprockets.</i>	1	2	2	Nil
6.10 Control Cables <i>Types of cables; End fittings, turnbuckles & compensation devices; Pulleys & cable system components; Bowden cables; Aircraft flexible control systems.</i>	1	2	1	Nil
6.11 Electrical Cables & Connectors <i>Cable types, construction & characteristics; High tension & co-axial cables; Crimping; Connector types, pins, plugs, sockets, insulators, current & voltage rating, coupling, identification codes.</i>	1	2	2	Nil
MODULE 7 MAINTENANCE PRACTICES				
7.1 Safety Precautions <i>Aircraft and Workshop Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals. Also, instruction in the remedial action to be taken in the event of a fire or another accident with one or more of these hazards including knowledge on extinguishing agents.</i>	3	3	3	Nil
7.2 Workshop Practices <i>Care of tools, control of tools, use of workshop materials; Dimensions, allowances and tolerances, standards of workmanship; Calibration of tools and equipment, calibration standards.</i>	3	3	3	Nil
7.3 Tools <i>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;</i>	3	3	3	Nil
7.4 Avionic General Test Equipment <i>Operation, function and use of avionic general test equipment.</i>	—	2	3	Nil
7.5 Engineering Drawings, Diagrams and Standards <i>Drawing types and diagrams, their symbols, dimensions, tolerances and projections; Identifying title block information; Microfilm, microfiche and computerised presentations;</i>	1	2	2	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
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.				
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	1	2	1	Nil
7.7 Electrical Cables and Connectors 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; Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding.	1	2	2	CASA differs applies L3 to B1/2
7.8 Riveting Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.	1	2	—	Nil
7.9 Pipes and Hoses Bending and belling/flaring aircraft pipes; Inspection and testing of aircraft pipes and hoses; Installation and clamping of pipes.	1	2	—	Nil
7.10 Springs Inspection and testing of springs.	1	2	—	Nil
7.11 Bearings Lubrication requirements of bearings; Defects in bearings and their causes.	1	2	—	CASA differs by adding 'testing, cleaning & inspection of bearings'.
7.12 Transmissions Inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.	1	2	—	Nil
7.13 Control Cables Swaging of end fittings; Inspection and testing of control cables; Bowden cables; aircraft flexible control systems	1	2	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
7.14 Material handling 7.14.1 Sheet Metal <i>Sheet metal working, including bending and forming; Inspection of sheet metal work.</i>	—	2	—	CASA differs by adding 'marking out, and calculation of, bend allowance"
7.14.2 Composite and non-metallic <i>Bonding practices; Environmental conditions; Inspection methods</i>	—	2	—	Nil
7.15 Welding, Brazing, Soldering and Bonding <i>(a) Soldering methods; inspection of soldered joints;</i>	—	2	2	Nil
<i>(b) Welding and brazing methods; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.</i>	—	2	—	Nil
7.16 Aircraft Weight and Balance <i>(a) Centre of Gravity/Balance limits calculation: use of relevant documents;</i>	—	2	2	Nil
<i>(b) Preparation of aircraft for weighing; Aircraft weighing;</i>	—	2	—	Nil
7.17 Aircraft Handling and Storage <i>Aircraft taxiing towing and associated safety precautions; Aircraft jacking, chocking, securing and associated safety precautions; Aircraft storage methods; Refuelling/defuelling procedures; De-icing/anti-icing procedures; Electrical, hydraulic and pneumatic ground supplies. Effects of environmental conditions on aircraft handling and operation.</i>	2	2	2	Nil
7.18 Disassembly, Inspection, Repair and Assembly Techniques <i>(a) Types of defects and visual inspection techniques. Corrosion removal, assessment and re-protection.</i>	2	3	2	Nil
<i>(b) General repair methods, Structural Repair Manual; Ageing, fatigue and corrosion control programmes;</i>	—	2	—	Nil
<i>(c) Non destructive inspection techniques including, penetrant, radiographic, eddy current, ultrasonic and boroscope methods.</i>	—	2	1	Nil
<i>(d) Disassembly and re-assembly techniques.</i>	2	2	2	Nil
<i>(e) Trouble shooting techniques</i>	—	2	2	Nil
7.19 Abnormal Events <i>(a) Inspections following lightning strikes and HIRF penetration.</i>	2	2	2	Nil
<i>(b) Inspections following abnormal events such as heavy landings and flight through turbulence.</i>	2	2	—	Nil
7.20 Maintenance Procedures <i>Maintenance planning; Modification procedures;</i>	1	2	2	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Stores procedures;</i> <i>Certification/release procedures;</i> <i>Interface with aircraft operation;</i> <i>Maintenance Inspection/Quality Control/Quality Assurance;</i> <i>Additional maintenance procedures.</i> <i>Control of life limited components.</i>				
MODULE 8 BASIC AERODYNAMICS				
8.1 Physics of the Atmosphere <i>International Standard Atmosphere (ISA), application to aerodynamics.</i>	1	2	2	Nil
8.2 Aerodynamics <i>Airflow around a body;</i> <i>Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, upwash and downwash, vortices, stagnation;</i> <i>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;</i> <i>Thrust, Weight, Aerodynamic Resultant;</i> <i>Generation of Lift and Drag: Angle of Attack, Lift coefficient, Drag coefficient, polar curve, stall;</i> <i>Aerofoil contamination including ice, snow, frost.</i>	1	2	2	Nil
8.3 Theory of Flight <i>Relationship between lift, weight, thrust and drag;</i> <i>Glide ratio;</i> <i>Steady state flights, performance;</i> <i>Theory of the turn;</i> <i>Influence of load factor: stall, flight envelope and structural limitations;</i> <i>Lift augmentation.</i>	1	2	2	Nil
8.4 Flight Stability and Dynamics <i>Longitudinal, lateral and directional stability (active and passive).</i>	1	2	2	Nil
MODULE 9 HUMAN FACTORS				
9.1 General <i>The need to take human factors into account;</i> <i>Incidents attributable to human factors/human error; 'Murphy's' law.</i>	1	2	2	CASA differs L2 for A
9.2 Human Performance and Limitations <i>Vision;</i> <i>Hearing;</i> <i>Information processing; Attention and perception;</i> <i>Memory;</i>	1	2	2	CASA differs L2 for A

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Claustrophobia and physical access.</i>				
9.3 Social Psychology <i>Responsibility: individual and group;</i> <i>Motivation and de-motivation; Peer pressure;</i> <i>'Culture' issues; Team working; Management, supervision and leadership.</i>	1	1	1	Nil
9.4 Factors Affecting Performance <i>Fitness/health;</i> <i>Stress: domestic and work related;</i> <i>Time pressure and deadlines;</i> <i>Workload: overload and underload;</i> <i>Sleep and fatigue, shiftwork;</i> <i>Alcohol, medication, drug abuse.</i>	2	2	2	Nil
9.5 Physical Environment <i>Noise and fumes;</i> <i>Illumination;</i> <i>Climate and temperature;</i> <i>Motion and vibration;</i> <i>Working environment.</i>	1	1	1	Nil
9.6 Tasks <i>Physical work;</i> <i>Repetitive tasks;</i> <i>Visual inspection;</i> <i>Complex systems.</i>	1	1	1	Nil
9.7 Communication <i>Within and between teams;</i> <i>Work logging and recording;</i> <i>Keeping up to date, currency;</i> <i>Dissemination of information.</i>	2	2	2	Nil
9.8 Human Error <i>Error models and theories;</i> <i>Types of error in maintenance tasks;</i> <i>Implications of errors (i.e. accidents)</i> <i>Avoiding and managing errors.</i>	1	2	2	CASA differs L2 for A
9.9 Hazards in the Workplace <i>Recognising and avoiding hazards;</i> <i>Dealing with emergencies.</i>	1	2	2	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
MODULE 10 AVIATION LEGISLATION				
10.1 Regulatory Framework <i>Role of International Civil Aviation Organisation;</i> <i>Role of EASA;</i> <i>Role of the Member States;</i> <i>Relationship between Part-145, Part-66, Part-147 and Part M;</i> <i>Relationship with other Aviation Authorities.</i>	1	1	1	Nil
10.2 Part-66 - Certifying Staff - Maintenance <i>Detailed understanding of Part-66.</i>	2	2	2	Nil
10.3 Part-145 - Approved Maintenance Organisations <i>Detailed understanding of Part-145.</i>	2	2	2	Nil
10.4 JAR-OPS - Commercial Air Transportation <i>Air Operators Certificates;</i> <i>Operators Responsibilities;</i> <i>Documents to be Carried;</i> <i>Aircraft Placarding (Markings);</i>	1	1	1	Nil
10.5 Aircraft Certification <i>(a) General Certification rules: such as EACS 23/25/27/29;</i> <i>Type Certification;</i> <i>Supplemental Type Certification;</i> <i>Part-21 Design/Production Organisation Approvals.</i>	—	1	1	Nil
<i>(b) Documents</i> <i>Certificate of Airworthiness;</i> <i>Certificate of Registration;</i> <i>Noise Certificate;</i> <i>Weight Schedule;</i> <i>Radio Station Licence and Approval.</i>	—	2	2	Nil
10.6 Part-M <i>Detailed understanding of Part-M.</i>	2	2	2	Nil
10.7 Applicable National and International Requirements for (if not superseded by EU requirements) <i>(a) Maintenance Programmes, Maintenance checks and inspections;</i> <i>Master Minimum Equipment Lists, Minimum Equipment List, Dispatch Deviation Lists;</i> <i>Airworthiness Directives;</i> <i>Service Bulletins, manufacturers service information;</i> <i>Modifications and repairs;</i> <i>Maintenance documentation: maintenance manuals, structural repair manual, illustrated parts catalogue, etc.;</i>	1	2	2	Nil
<i>b) Continuing airworthiness;</i> <i>Test flights;</i>	—	1	1	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>ETOPS, maintenance and dispatch requirements; All Weather Operations, Category 2/3 operations and minimum equipment requirements.</i>				
MODULE 11A TURBINE AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS		(B1.1)		
11.1 Theory of Flight 11.1.1 Aeroplane Aerodynamics and Flight Controls <i>Operation and effect of:</i> - roll control: ailerons and spoilers; - pitch control: elevators, stabilators, variable incidence stabilisers and canards; - yaw control, rudder limiters; <i>Control using elevons, ruddervators;</i> <i>High lift devices, slots, slats, flaps, flaperons;</i> <i>Drag inducing devices, spoilers, lift dumpers, speed brakes;</i> <i>Effects of wing fences, saw tooth leading edges;</i> <i>Boundary layer control using, vortex generators, stall wedges or leading edge devices;</i> <i>Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels;</i>	1	2	—	Nil
11.1.2 High Speed Flight <i>Speed of sound, subsonic flight, transonic flight, supersonic flight,</i> <i>Mach number, critical Mach number, compressibility buffet, shock wave, aerodynamic beating, area rule;</i> <i>Factors affecting airflow in engine intakes of high speed aircraft;</i> <i>Effects of sweepback on critical Mach number.</i>	1	2	—	Nil
11.2 Airframe Structures - General Concepts <i>(a) Airworthiness requirements for structural strength;</i> <i>Structural classification, primary, secondary and tertiary;</i> <i>Fail safe, safe life, damage tolerance concepts;</i> <i>Zonal and station identification systems;</i> <i>Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue;</i> <i>Drains and ventilation provisions;</i> <i>System installation provisions;</i> <i>Lightning strike protection provision.</i> Aircraft bonding	2	2	—	Nil
<i>(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;</i> <i>Structure assembly techniques: riveting, bolting, bonding;</i> <i>Methods of surface protection, such as chromating, anodising, painting;</i> <i>Surface cleaning;</i> <i>Airframe symmetry: methods of alignment and symmetry checks.</i>	1	2	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
11.3 Airframe Structures - Aeroplanes 11.3.1 Fuselage (ATA 52/53/56) <i>Construction and pressurisation sealing;</i> <i>Wing, stabiliser, pylon and undercarriage attachments;</i> <i>Seat installation and cargo loading system;</i> <i>Doors and emergency exits: construction, mechanisms, operation and safety devices;</i> <i>Windows and windscreen construction and mechanisms.</i>	1	2	—	Nil
11.3.2 Wings (ATA 57) <i>Construction;</i> <i>Fuel storage;</i> <i>Landing gear, pylon, control surface and high lift/drag attachments.</i>	1	2	—	Nil
11.3.3 Stabilisers (ATA 55) <i>Construction;</i> <i>Control surface attachment.</i>	1	2	—	Nil
11.3.4 Flight Control Surfaces (ATA 55/57) <i>Construction and attachment;</i> <i>Balancing - mass and aerodynamic.</i>	1	2	—	Nil
11.3.5 Nacelles/Pylons (ATA 54) <i>Nacelles/Pylons:</i> - <i>Construction;</i> - <i>Firewalls;</i> - <i>Engine mounts.</i>	1	2	—	Nil
11.4 Air Conditioning and Cabin Pressurisation (ATA 21) 11.4.1 Air supply <i>Sources of air supply including engine bleed, APU and ground cart;</i>	1	2	—	Nil
11.4.2 Air Conditioning <i>Air conditioning systems;</i> <i>Air cycle and vapour cycle machines;</i> <i>Distribution systems;</i> <i>Flow, temperature and humidity control system.</i>	1	3	—	Nil
11.4.3 Pressurisation <i>Pressurisation systems;</i> <i>Control and indication including control and safety valves;</i> <i>Cabin pressure controllers.</i>	1	3	—	Nil
11.4.4 Safety and warning devices <i>Protection and warning devices.</i>	1	3	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
11.5 Instruments/Avionic Systems 11.5.1 Instrument Systems (ATA 31) <i>Pitot static: altimeter, air speed indicator, vertical speed indicator;</i> <i>Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator;</i> <i>Compasses: direct reading, remote reading;</i> <i>Angle of attack indication, stall warning systems;</i> <i>Other aircraft system indication.</i>	1	2	—	Nil
11.5.2 Avionic Systems <i>Fundamentals of system lay-outs and operation of;</i> <i>Auto Flight (ATA 22);</i> <i>Communications (ATA 23);</i> <i>Navigation Systems (ATA 34).</i>	1	1	—	Nil
11.6 Electrical Power (ATA 24) <i>Batteries Installation and Operation;</i> <i>DC power generation;</i> <i>AC power generation;</i> <i>Emergency power generation;</i> <i>Voltage regulation;</i> <i>Power distribution;</i> <i>Inverters, transformers, rectifiers;</i> <i>Circuit protection.</i> <i>External/Ground power;</i>	1	3	—	Nil
11.7 Equipment and Furnishings (ATA 25) (a) <i>Emergency equipment requirements;</i> <i>Seats, harnesses and belts.</i>	2	2	—	Nil
(b) <i>Cabin lay-out;</i> <i>Equipment lay-out;</i> <i>Cabin Furnishing Installation;</i> <i>Cabin entertainment equipment;</i> <i>Galley installation;</i> <i>Cargo handling and retention equipment;</i> <i>Airstairs.</i>	1	1	—	Nil
11.8 Fire Protection (ATA 26) (a) <i>Fire and smoke detection and warning systems;</i> <i>Fire extinguishing systems;</i> <i>System tests.</i>	1	3	—	Nil
(b) <i>Portable fire extinguisher</i>	1	1	—	CASA differs L3 for B1

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
11.9 Flight Controls (ATA 27) <i>Primary controls: aileron, elevator, rudder, spoiler;</i> <i>Trim control;</i> <i>Active load control;</i> <i>High lift devices;</i> <i>Lift dump, speed brakes;</i> <i>System operation: manual, hydraulic, pneumatic, electrical,</i> <i>Fly-by-wire;</i> <i>Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks systems;</i> <i>Balancing and rigging;</i> <i>Stall protection/warning system.</i>	1	3	—	Nil
11.10 Fuel Systems (ATA 28) <i>System lay-out;</i> <i>Fuel tanks;</i> <i>Supply systems;</i> <i>Dumping, venting and draining;</i> <i>Cross-feed and transfer;</i> <i>Indications and warnings;</i> <i>Refuelling and defuelling;</i> <i>Longitudinal balance fuel systems.</i>	1	3	—	Nil
11.11 Hydraulic Power (ATA 29) <i>System lay-out;</i> <i>Hydraulic fluids;</i> <i>Hydraulic reservoirs and accumulators;</i> <i>Pressure generation: electric, mechanical, pneumatic;</i> <i>Emergency pressure generation;</i> <i>Pressure Control;</i> <i>Power distribution;</i> <i>Indication and warning systems;</i> <i>Interface with other systems.</i>	1	3	—	Nil
11.12 Ice and Rain Protection (ATA 30) <i>Ice formation, classification and detection;</i> <i>Anti-icing systems: electrical, hot air and chemical;</i> <i>De-icing systems: electrical, hot air, pneumatic and chemical;</i> <i>Rain repellent;</i> <i>Probe and drain heating.</i> <i>Wiper systems</i>	1	3	—	Nil
11.13 Landing Gear (ATA 32) <i>Construction, shock absorbing;</i>	2	3	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Extension and retraction systems: normal and emergency;</i> <i>Indications and warning;</i> <i>Wheels, brakes, antiskid and autobraking;</i> <i>Tyres;</i> <i>Steering.</i>				
11.14 Lights (ATA 33) <i>External: navigation, anti-collision, landing, taxiing, ice;</i> <i>Internal: cabin, cockpit, cargo;</i> <i>Emergency.</i>	2	3	—	Nil
11.15 Oxygen (ATA 35) <i>System lay-out: cockpit, cabin;</i> <i>Sources, storage, charging and distribution;</i> <i>Supply regulation;</i> <i>Indications and warnings;</i>	1	3	—	Nil
11.16 Pneumatic/Vacuum (ATA 36) <i>System lay-out;</i> <i>Sources: engine/APU, compressors, reservoirs, ground supply;</i> <i>Pressure control;</i> <i>Distribution;</i> <i>Indications and warnings;</i> <i>Interfaces with other systems.</i>	1	3	—	Nil
11.17 Water / Waste (ATA 38) <i>Water system lay-out, supply, distribution, servicing and draining;</i> <i>Toilet system lay-out, flushing and servicing;</i> <i>Corrosion aspects.</i>	2	3	—	Nil
11.18 On Board Maintenance Systems (ATA 45) <i>Central maintenance computers;</i> <i>Data loading system;</i> <i>Electronic library system;</i> <i>Printing;</i> <i>Structure monitoring (damage tolerance monitoring).</i>	1	2	—	Nil
CASA has additional modules: 11.19 Integrated Modular Avionics (ATA 42) 11.20 Cabin Systems (ATA 44) 11.21 Information Systems (ATA 46)	1 1 1	2 2 2		CASA Specified CASA Specified CASA Specified

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
MODULE 11B PISTON AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS		(B1.2)		
11.1 Theory of Flight 11.1.1 Aeroplane Aerodynamics and Flight Controls <i>Operation and effect of:</i> - roll control: ailerons and spoilers; - pitch control: elevators, stabilators, variable incidence stabilisers and canards; - yaw control, rudder limiters; <i>Control using elevons, ruddervators;</i> <i>High lift devices, slots, slats, flaps, flaperons;</i> <i>Drag inducing devices, spoilers, lift dumpers, speed brakes;</i> <i>Effects of wing fences, saw tooth leading edges;</i> <i>Boundary layer control using, vortex generators, stall wedges or leading edge devices;</i> <i>Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels;</i>	1	2	—	Nil
11.1.2 High Speed Flight - N/A	—	—	—	CASA differs included in B1
11.2 Airframe Structures - General Concepts <i>(a) Airworthiness requirements for structural strength;</i> <i>Structural classification, primary, secondary and tertiary;</i> <i>Fail safe, safe life, damage tolerance concepts;</i> <i>Zonal and station identification systems;</i> <i>Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue;</i> <i>Drains and ventilation provisions;</i> <i>System installation provisions;</i> <i>Lightning strike protection provision.</i> Aircraft bonding	2	2	—	Nil
<i>(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;</i> <i>Structure assembly techniques: riveting, bolting, bonding;</i> <i>Methods of surface protection, such as chromating, anodising, painting;</i> Surface cleaning; Airframe symmetry: methods of alignment and symmetry checks.	1	2	—	Nil
11.3 Airframe Structures - Aeroplanes 11.3.1 Fuselage (ATA 52/53/56) <i>Construction and pressurisation sealing;</i> Wing, tail-plane pylon and undercarriage attachments; Seat installation; Doors and emergency exits: construction and operation; Window and windscreen attachment.	1	2	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
11.3.2 Wings (ATA 57) <i>Construction;</i> <i>Fuel storage;</i> <i>Landing gear, pylon, control surface and high lift/drag attachments.</i>	1	2	—	Nil
11.3.3 Stabilisers (ATA 55) <i>Construction;</i> <i>Control surface attachment.</i>	1	2	—	Nil
11.3.4 Flight Control Surfaces (ATA 55/57) <i>Construction and attachment;</i> <i>Balancing - mass and aerodynamic.</i>	1	2	—	Nil
11.3.5 Nacelles/Pylons (ATA 54) <i>Nacelles/Pylons:</i> <i>- Construction;</i> <i>- Firewalls;</i> <i>- Engine mounts.</i>	1	2	—	Nil
11.4 Air Conditioning and Cabin Pressurisation (ATA 21) <i>Pressurisation and air conditioning systems;</i> <i>Cabin pressure controllers, protection and warning devices.</i>	1	3	—	CASA differs includes 11.4.1, 11.4.2, 11.4.3, 11.4.4.
CASA Sub Modules: 11.4.1 Air Supply, 11.4.2 Air Conditioning, 11.4.3 Pressurisation & 11.4.4 Safety & Warning Devices				
11.5 Instruments/Avionic Systems 11.5.1 Instrument Systems (ATA 31) <i>Pitot static: altimeter, air speed indicator, vertical speed indicator;</i> <i>Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator;</i> <i>Compasses: direct reading, remote reading;</i> <i>Angle of attack indication, stall warning systems.</i> <i>Other aircraft system indication.</i>	1	2	—	CASA differs adds 'Glass cockpit'.
11.5.2 Avionic Systems <i>Fundamentals of system lay-outs and operation of:</i> <i>- Auto Flight (ATA 22);</i> <i>- Communications (ATA 23);</i> <i>-Navigation Systems (ATA 34).</i>	1	1	—	Nil
11.6 Electrical Power (ATA 24) <i>Batteries Installation and Operation;</i>	1	3	—	CASA differs include AC power generation

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
DC power generation; Voltage regulation; Power distribution; Circuit protection; Inverters, transformers.				Emergency power generation Rectifiers External and ground power
11.7 Equipment and Furnishings (ATA 25) (a) Emergency equipment requirements; Seats, harnesses and belts.	2	2	—	Nil
(b) Cabin lay-out; Equipment lay-out; Cabin Furnishing Installation (level 2); Cabin entertainment equipment; Galley installation; Cargo handling and retention equipment; Airstairs.	1	1	—	Nil
11.8 Fire Protection (ATA 26) (a) Fire extinguishing systems; Fire and smoke detection and warning systems; System tests.	1	3	—	Nil
(b) Portable fire extinguisher.	1	3	—	Nil
11.9 Flight Controls (ATA 27) Primary controls: aileron, elevator, rudder; Trim tabs; High lift devices; System operation: manual; Gust locks; Balancing and rigging; Stall warning system.	1	3	—	CASA differs adds Active load control Lift dump, speed brakes (manual, hydraulic, pneumatic, electrical, fly-by-wire) Artificial feel, Yaw Damper, Mach Trim, rudder limiter,
11.10 Fuel Systems (ATA 28) System lay-out; Fuel tanks; Supply systems; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling.	1	3	—	Nil
11.11 Hydraulic Power (ATA 29) System lay-out; Hydraulic fluids; Hydraulic reservoirs and accumulators;	1	3	—	CASA differs by adding [xx]

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
Pressure generation: electric, mechanical; [pneumatic] Pressure Control; Power distribution; Indication and warning systems. [Interface with other systems]				
11.12 Ice and Rain Protection (ATA 30) Ice formation, classification and detection; De-icing systems: electrical, hot air, pneumatic and chemical; Probe and drain heating; Wiper systems.	1	3	—	CASA differs by adding 'rain repellent'.
11.13 Landing Gear (ATA 32) Construction, shock absorbing; Extension and retraction systems: normal and emergency; Indications and warning; Wheels, brakes, antiskid and autobraking; Tyres; Steering.	2	3	—	Nil
11.14 Lights (ATA 33) External: navigation, anti collision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	1	3	—	CASA differs L2 applied to A
11.15 Oxygen (ATA 35) System lay-out: cockpit, cabin; Sources, storage, charging and distribution; Supply regulation; Indications and warnings;	1	3	—	Nil
11.16 Pneumatic/Vacuum (ATA 36) System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.	1	3	—	Nil
11.17 Water / Waste (ATA 38) Water system lay-out, supply, distribution, servicing and draining; Toilet system lay-out, flushing and servicing; Corrosion aspects.	2	3	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
CASA has additional modules: 11.19 Integrated Modular Avionics (ATA 42) 11.20 Cabin Systems (ATA 44) 11.21 Information Systems (ATA 46)	1 1 1	2 2 2		CASA Specified CASA Specified CASA Specified
MODULE 12 HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS	A3 A4	B1.3 B1.4	—	
12.1 Theory of Flight - Rotary Wing Aerodynamics <i>Terminology;</i> <i>Effects of gyroscopic precession;</i> <i>Torque reaction and directional control;</i> <i>Dissymmetry of lift, Blade tip stall;</i> <i>Translating tendency and its correction;</i> <i>Coriolis effect and compensation;</i> <i>Vortex ring state, power settling, overpitching;</i> <i>Auto-rotation;</i> <i>Ground effect.</i>	1	2	—	Nil
12.2 Flight Control Systems <i>Cyclic control;</i> <i>Collective control;</i> <i>Swashplate;</i> <i>Yaw control: Anti-Torque Control, Tail rotor, bleed air;</i> <i>Main Rotor Head: Design and Operation features;</i> <i>Blade Dampers: Function and construction;</i> <i>Rotor Blades: Main and tail rotor blade construction and attachment;</i> <i>Trim control, fixed and adjustable stabilisers;</i> <i>System operation: manual, hydraulic, electrical and fly-by-wire;</i> <i>Artificial feel;</i> <i>Balancing and Rigging.</i>	2	3	—	Nil
12.3 Blade Tracking and Vibration Analysis <i>Rotor alignment;</i> <i>Main and tail rotor tracking;</i> <i>Static and dynamic balancing;</i> <i>Vibration types, vibration reduction methods;</i> <i>Ground resonance.</i>	1	3	—	Nil
12.4 Transmissions <i>Gear boxes, main and tail rotors;</i> <i>Clutches, free wheel units and rotor brake.</i>	1	3	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<p>12.5 Airframe Structures</p> <p><i>(a) Airworthiness requirements for structural strength;</i> <i>Structural classification, primary, secondary and tertiary;</i> <i>Fail safe, safe life, damage tolerance concepts;</i> <i>Zonal and station identification systems;</i> <i>Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue;</i> <i>Drains and ventilation provisions;</i> <i>System installation provisions;</i> <i>Lightning strike protection provision.</i></p>	2	2	—	Nil
<p><i>(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.</i> <i>Pylon, stabiliser and undercarriage attachments;</i> <i>Seat installation;</i> <i>Doors: construction, mechanisms, operation and safety devices;</i> <i>Windows and windscreen construction;</i> <i>Fuel storage;</i> <i>Firewalls;</i> <i>Engine mounts;</i> <i>Structure assembly techniques: riveting, bolting, bonding;</i> <i>Methods of surface protection, such as chromating,</i> <i>Anodising, painting;</i> <i>Surface cleaning.</i> <i>Airframe symmetry: methods of alignment and symmetry checks.</i></p>	1	2	—	Nil
<p>12.6 Air Conditioning (ATA 21)</p> <p>12.6.1 Air supply <i>Sources of air supply including engine bleed and ground cart;</i></p>	1	2	—	Nil
<p>12.6.2 Air Conditioning <i>Air conditioning systems;</i> <i>Distribution systems;</i> <i>Flow and temperature control systems;</i> <i>Protection and warning devices.</i></p>	1	3	—	Nil
<p>12.7 Instruments/Avionic Systems</p> <p>12.7.1 Instrument Systems (ATA 31) <i>Pitot static: altimeter, air speed indicator, vertical speed indicator;</i> <i>Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator;</i> <i>Compasses: direct reading, remote reading;</i> <i>Vibration indicating systems - HUMS;</i> <i>Other aircraft system indication.</i></p>	1	2	—	CASA differs adds 'Glass cockpit'

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
12.7.2 Avionic Systems <i>Fundamentals of system layouts and operation of: Auto Flight (ATA 22); Communications (ATA 23); Navigation Systems (ATA 34).</i>	1	1	—	Nil
12.8 Electrical Power (ATA 24) <i>Batteries Installation and Operation; DC power generation, AC power generation; Emergency power generation; Voltage regulation, Circuit protection. Power distribution; Inverters, transformers, rectifiers; External/Ground power.</i>	1	3	—	Nil
12.9 Equipment and Furnishings (ATA 25) <i>(a) Emergency equipment requirements; Seats, harnesses and belts; Lifting systems.</i>	2	2	—	Nil
<i>(b) Emergency flotation systems; Cabin lay-out, cargo retention; Equipment lay-out; Cabin Furnishing Installation.</i>	1	1	—	Nil
12.10 Fire Protection (ATA 26) <i>Fire and smoke detection and warning systems; Fire extinguishing systems; System tests.</i>	1	3	—	Nil
12.11 Fuel Systems (ATA 28) <i>System lay-out; Fuel tanks; Supply systems; Dumping, venting and draining; Cross-feed and transfer; Indications and warnings; Refuelling and defuelling.</i>	1	3	—	Nil
12.12 Hydraulic Power (ATA 29) <i>System lay-out; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical, pneumatic; Emergency pressure generation;</i>	1	3	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Pressure Control;</i> <i>Power distribution;</i> <i>Indication and warning systems;</i> <i>Interface with other systems.</i>				
12.13 Ice and Rain Protection (ATA 30) <i>Ice formation, classification and detection;</i> <i>Anti-icing and de-icing systems: electrical, hot air and chemical;</i> <i>Rain repellent and removal;</i> <i>Probe and drain heating.</i>	1	3	—	Nil
12.14 Landing Gear (ATA 32) <i>Construction, shock absorbing;</i> <i>Extension and retraction systems: normal and emergency;</i> <i>Indications and warning;</i> <i>Wheels, tyres, brakes;</i> <i>Steering;</i> <i>Skids, floats.</i>	2	3	—	Nil
12.15 Lights (ATA 33) <i>External: navigation, landing, taxiing, ice;</i> <i>Internal: cabin, cockpit, cargo;</i> <i>Emergency.</i>	2	3	—	Nil
12.16 Pneumatic/Vacuum (ATA 36) <i>System lay-out;</i> <i>Sources: engine, compressors, reservoirs, ground supply;</i> <i>Pressure control;</i> <i>Distribution;</i> <i>Indications and warnings;</i> <i>Interfaces with other systems.</i>	1	3	—	Nil
CASA has additional modules: 12.17 Integrated Modular Avionics (ATA 42) 12.18 On-board maintenance systems (ATA 45) 12.19 Information Systems (ATA 46)	1 1 1	2 2 2		CASA Specified CASA Specified CASA Specified
MODULE 13 AIRCRAFT AERODYNAMICS STRUCTURES AND SYSTEMS				
13.1 Theory of Flight <i>(a) Aeroplane Aerodynamics and Flight Controls Operation and effect of:</i> <i>- roll control: ailerons and spoilers;</i> <i>- pitch control: elevators, stabilators, variable incidence stabilisers and canards;</i> <i>- yaw control, rudder limiters;</i>	—	—	1	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
Control using elevons, ruddervators; High lift devices: slots, slats, flaps; Drag inducing devices: spoilers, lift dumpers, speed Operation and effect of trim tabs, servo control surface bias.				
(b) High Speed Flight Speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, critical Mach number.	—	—	1	Nil
(c) Rotary Wing Aerodynamics Terminology; Operation and effect of cyclic, collective anti-torque controls.	—	—	1	Nil
13.2 Structures -General Concepts (a) Fundamentals of structural systems.	—	—	1	Nil
(b) Zonal and station identification systems; Electrical bonding; Lightning strike protection provision.	—	—	2	Nil
13.3 Autoflight (ATA 22) Fundamentals of automatic flight control including working principles and current terminology; Command signal processing; Modes of operation: roll, pitch and yaw channels; Yaw dampers; Stability Augmentation System in helicopters; Automatic trim control; Autopilot navigation aids interface; Autothrottle systems. Automatic Landing Systems: principles and categories, modes of operation, approach, glideslope, land, go-around, system monitors and failure conditions.	—	—	3	Nil
13.4 Communication/Navigation (ATA 23/34) Fundamentals of radio wave propagation, antennas, transmission lines, communication receiver and transmitter; Working principles of following systems: - Very High Frequency (VHF) communication; - High Frequency (HF) communication; - Audio; - Emergency Locator Transmitters; - Cockpit Voice Recorder; - Very High Frequency omnidirectional range (VOR); - Automatic Direction Finding (ADF); - Instrument Landing System (ILS); - Microwave Landing System (MLS); - Flight Director systems; - Distance Measuring Equipment (DME); - Very Low Frequency and hyperbolic navigation (VLF Omega); - Doppler navigation;	—	—	3	CASA differs by not including 'Very Low Frequency and hyperbolic navigation (VLF Omega)' 'Global Navigation Satellite Systems (GNSS)'

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<ul style="list-style-type: none"> - Area navigation, RNAV systems; - Flight Management Systems; - Global Positioning System (GPS), - Global Navigation Satellite Systems (GNSS) - Inertial Navigation System; - Air Traffic Control transponder, secondary surveillance radar; - Traffic Alert and Collision Avoidance System (TCAS); - Weather avoidance radar; - Radio altimeter; - ARINC communication and reporting; 				
3.5 Electrical Power (ATA 24) Batteries Installation and Operation; DC power generation; AC power generation; Emergency power generation; Voltage regulation; Power distribution; Inverters, transformers, rectifiers;	—	—	3	CASA differs by adding 'Circuit protection; & External and ground power'
13.6 Equipment and Furnishings (ATA 25) Electronic emergency equipment requirements; Cabin entertainment equipment.	—	—	3	Nil
13.7 Flight Controls (ATA 27) (a) Primary controls: aileron, elevator, rudder; spoiler; Trim control; Active load control; High lift devices; Lift dump, speed brakes; System operation: manual, hydraulic, pneumatic; Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks. Stall protection systems.	—	—	1	Nil
(b) System operation: electrical, fly by wire.	—	—	2	CASA differs L3 for B2
13.8 Instrument Systems (ATA 31) Atmosphere; Terminology; Pressure measuring devices and systems; Pitot static systems; Altimeters; Vertical speed indicators; Airspeed indicators;	—	—	2	CASA differs L3 for B2

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Machmeters;</i> <i>Altitude reporting / alerting systems;</i> <i>Air data computers;</i> <i>Instrument pneumatic systems;</i> <i>Direct reading pressure and temperature gauges;</i> <i>Temperature indicating systems;</i> <i>Fuel quantity indicating systems;</i> <i>Gyroscopic principles;</i> <i>Artificial horizons;</i> <i>Slip indicators;</i> <i>Directional gyros;</i> <i>Ground Proximity Warning Systems;</i> <i>Compass systems;</i> <i>Flight Data Recording systems;</i> <i>Electronic Flight Instrument Systems;</i> <i>Instrument warning systems including master warning systems and centralised warning panels;</i> <i>Stall warning systems and angle of attack indicating systems;</i> <i>Vibration measurement and indication.</i>				
13.9 Lights (ATA 33) <i>External: navigation, landing, taxiing, ice;</i> <i>Internal: cabin, cockpit, cargo;</i> <i>Emergency.</i>	—	—	3	Nil
13.10 On board Maintenance Systems (ATA 45) <i>Central maintenance computers;</i> <i>Data loading system;</i> <i>Electronic library system;</i> <i>Printing;</i> <i>Structure monitoring (damage tolerance monitoring).</i>	—	—	2	Nil
CASA has additional modules: 13.11 Air-conditioning and cabin pressurisation (ATA21) 13.12 Fire Protection (ATA26) 13.13 Fuel Systems (ATA28) 13.14 Hydraulic power (ATA29) 13.15 Ice & rain Protection (ATA30) 13.16 Landing Gear (ATA32) 13.17 Oxygen (ATA 35) 13.18 Pneumatic/vacuum (ATA36) 13.19 Water/waste (ATA38)			1-3	CASA Specified

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
13.20 Integrated Modular Avionics (ATA 42) 13.21 Cabin Systems (ATA44) 13.22 Information Systems (ATA 46)				
MODULE 14 PROPULSION				
14.1 Turbine Engines <i>(a) Constructional arrangement and operation of turbojet, turbofan, turboshaft and turbopropeller engines;</i>	—	—	1	Nil
<i>(b) Electronic Engine control and fuel metering systems (FADEC).</i>	—	—	2	Nil
14.2 Engine Indicating Systems <i>Exhaust gas temperature/Interstage turbine temperature systems; Engine speed; Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems; Oil pressure and temperature; Fuel pressure, temperature and flow; Manifold pressure; Engine torque; Propeller speed.</i>	—	—	2	Nil
14.3 Starting and ignition system			2	CASA Specified
MODULE 15 GAS TURBINE ENGINE				
15.1 Fundamentals <i>Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle; The relationship between force, work, power, energy, velocity, acceleration; Constructional arrangement and operation of turbojet, turbofan, turboshaft, turboprop.</i>	1	2	—	Nil
15.2 Engine Performance <i>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.</i>	—	2	—	Nil
15.3 Inlet <i>Compressor inlet ducts Effects of various inlet configurations; Ice protection.</i>	2	2	—	Nil
15.4 Compressors <i>Axial and centrifugal types;</i>	1	2	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Constructional features and operating principles and applications;</i> <i>Fan balancing;</i> <i>Operation;</i> <i>Causes and effects of compressor stall and surge;</i> <i>Methods of air flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades;</i> <i>Compressor ratio.</i>				
15.5 Combustion Section <i>Constructional features and principles of operation.</i>	1	2	—	Nil
15.6 Turbine Section <i>Operation and characteristics of different turbine blade types;</i> <i>Blade to disk attachment;</i> <i>Nozzle guide vanes;</i> <i>Causes and effects of turbine blade stress and creep.</i>	2	2	—	Nil
15.7 Exhaust <i>Constructional features and principles of operation;</i> <i>Convergent, divergent and variable area nozzles;</i> <i>Engine noise reduction;</i> <i>Thrust reversers.</i>	1	2	—	Nil
15.8 Bearings and Seals <i>Constructional features and principles of operation.</i>	—	2	—	Nil
15.9 Lubricants and Fuels <i>Properties and specifications;</i> <i>Fuel additives;</i> <i>Safety precautions.</i>	1	2	—	Nil
15.10 Lubrication Systems <i>System operation/lay-out and components.</i>	1	2	—	Nil
5.11 Fuel Systems <i>Operation of engine control and fuel metering systems including electronic engine control (FADEC);</i> <i>Systems lay-out and components.</i>	1	2	—	Nil
15.12 Air Systems <i>Operation of engine air distribution and anti-ice control systems, including internal cooling, sealing and external air services.</i>	1	2	—	Nil
15.13 Starting and Ignition Systems <i>Operation of engine start systems and components;</i> <i>Ignition systems and components;</i> <i>Maintenance safety requirements.</i>	1	2	—	Nil
15.14 Engine Indication Systems <i>Exhaust Gas Temperature/Interstage Turbine Temperature;</i> <i>Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems;</i>	1	2	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Oil pressure and temperature; Fuel pressure and flow; Engine speed; Vibration measurement and indication; Torque; Power.</i>				
5.15 Power Augmentation Systems <i>Operation and applications; Water injection, water methanol; Afterburner systems.</i>	—	1	—	Nil
15.16 Turbo-prop Engines <i>Gas coupled/free turbine and gear coupled turbines; Reduction gears; Integrated engine and propeller controls; Overspeed safety devices.</i>	1	2	—	Nil
15.17 Turbo-shaft engines <i>Arrangements, drive systems, reduction gearing, couplings, control systems.</i>	1	2	—	Nil
15.18 Auxiliary Power Units (APUs) <i>Purpose, operation, protective systems.</i>	1	2	—	Nil
15.19 Powerplant Installation <i>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.</i>	1	2	—	Nil
15.20 Fire Protection Systems <i>Operation of detection and extinguishing systems.</i>	1	2	—	Nil
15.21 Engine Monitoring and Ground Operation <i>Procedures for starting and ground run-up; Interpretation of engine power output and parameters; Trend (including oil analysis, vibration and boroscope) monitoring; Inspection of engine and components to criteria, tolerances and data specified by engine manufacturer; Compressor washing cleaning; Foreign Object Damage.</i>	1	3	—	Nil
15.22 Engine Storage and Preservation <i>Preservation and de preservation for the engine and accessories/systems.</i>	—	2	—	Nil
MODULE 16 PISTON ENGINE				
16.1 Fundamentals <i>Mechanical, thermal and volumetric efficiencies; Operating principles - 2 stroke, 4 stroke, Otto and Diesel;</i>	1	2	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Piston displacement and compression ratio; Engine configuration and firing order.</i>				
16.2 Engine Performance <i>Power calculation and measurement; Factors affecting engine power; Mixtures/leaning, pre-ignition.</i>	1	2	—	Nil
16.3 Engine Construction <i>Crank case, crank shaft, cam shafts, sumps; Accessory gearbox; Cylinder and piston assemblies; Connecting rods, inlet and exhaust manifolds; Valve mechanisms; Propeller reduction gearboxes.</i>	1	2	—	Nil
16.4 Engine Fuel Systems 16.4.1 Carburettors <i>Types, construction and principles of operation; Icing and heating.</i>	1	2	—	Nil
16.4.2 Fuel injection systems <i>Types, construction and principles of operation</i>	1	2	—	Nil
16.4.3 Electronic engine control <i>Operation of engine control and fuel metering systems including electronic engine control (FADEC); Systems lay-out and components</i>	1	2	—	Nil
16.5 Starting and Ignition Systems <i>Starting systems, pre-heat systems; Magneto types, construction and principles of operation; Ignition harnesses, spark plugs; Low and high tension systems.</i>	1	2	—	Nil
16.6 Induction, Exhaust and Cooling Systems <i>Construction and operation of. induction systems including alternate air systems; Exhaust systems, engine cooling systems - air and liquid.</i>	1	2	—	Nil
16.7 Supercharging/Turbocharging <i>Principles and purpose of supercharging and its effects on engine parameters; Construction and operation of supercharging/turbocharging systems; System terminology; Control systems; System protection.</i>	1	2	—	Nil
16.8 Lubricants and Fuels <i>Properties and specifications;</i>	1	2	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
<i>Fuel additives; Safety precautions.</i>				
16.9 Lubrication Systems <i>System operation/lay-out and components.</i>	1	2	—	Nil
16.10 Engine Indication Systems <i>Engine speed; Cylinder head temperature; Coolant temperature; Oil pressure and temperature; Exhaust Gas Temperature; Fuel pressure and flow; Manifold pressure.</i>	1	2	—	Nil
16.11 Powerplant installation <i>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.</i>	1	2	—	Nil
16.12 Engine Monitoring and Ground Operation <i>Procedures for starting and ground run-up; Interpretation of engine power output and parameters; Inspection of engine and components: criteria, tolerances, and data specified by engine manufacturer.</i>	1	3	—	Nil
16.13 Engine Storage and Preservation <i>Preservation and de preservation for the engine and accessories/systems</i>	—	2	—	Nil
MODULE 17 PROPELLERS				
17.1 Fundamentals <i>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.</i>	1	2	—	Nil
17.3 Propeller Pitch Control <i>Speed control and pitch change methods, mechanical and electrical/electronic; Feathering and reverse pitch; Overspeed protection.</i>	1	2	—	Nil
17.4 Propeller Synchronising <i>Synchronising and synchrophasing equipment.</i>	—	2	—	Nil

EASA PART 66 SPECIFICATIONS & COMPARISON CASA PART 66 MODULES

MODULES	LEVEL			Comparison
	A	B1	B2	CASA Differences
17.5 Propeller Ice Protection <i>Fluid and electrical de-icing equipment.</i>	1	2	—	Nil
17.6 Propeller Maintenance <i>Static and dynamic balancing; Blade tracking; Assessment of blade damage, erosion, corrosion, impact damage, delamination; Propeller treatment/repair schemes; Propeller engine running.</i>	1	3	—	Nil
17.7 Propeller Storage and Preservation <i>Propeller preservation and depreservation</i>	1	2	—	nil