Module 5

Digital Techniques/Electronic Instrument Systems

	Level		
5.1 Electronic Instrument Systems	A	B1	B2
Typical systems arrangements and cockpit layout of electronic instrument systems.	1	2	3
5.2 Numbering Systems	A	B1	B2
Numbering systems: binary, octal & hexadecimal; Demonstration of conversions between the decimal & binary, octal & hexadecimal systems & vice versa.	-	1	2
5.3 Data Conversion	A	B1	B2
Analogue Data, Digital Data; Operation and application of analogue to digital, & digital to analogue converters, inputs & outputs, limitations of various types.	-	1	2
5.4 Data Buses	A	B1	B2
Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications.	-	2	2
5.5 Logic Circuits	A	B1	B2
a) Identification of common logic gate symbols, tables & equivalent circuits; Applications used for aircraft systems, schematic diagrams;	-	2	2
b) Interpretation of logic diagrams.	-	-	2
5.6 Basic Computer Terminology	A	B1	B2
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);	1	2	-
b) Computer related terminology; Operation, layout & 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 & disadvantages of the various data storage systems.	-	-	2
5.7 Microprocessors	A	B1	B2
Functions performed & overall operation of a microprocessor; Basic operation of the following microprocessor elements: control & processing unit, clock, register, arithmetic logic unit.	-	-	2
5.8 Integrated Circuits	A	B1	B2
Operation and use of encoders & decoders; Function of encoder types; Uses of medium, large & very large scale integration.	-	-	2
5.9 Multiplexing	A	B1	B2
Operation, application & identification in logic diagrams of multiplexers & demultiplexers.	-	-	2
5.10 Fibre Optics	A	B1	B2
Advantages & disadvantages of fibre optic data transmission over electrical wire propagation; Fibre optic data bus; Fibre optic related terms; Terminations; Couplers, control terminals, remote terminals; Application of fibre optics in aircraft systems.	-	1	2
5.11 Electronic Displays	A	B1	B2
Principles of operation of common display types used in modem aircraft, inc. CRT, LED & LCD.	-	2	2
5.12 Electrostatic Sensitive Devices	A	B1	B2
Special handling of components sensitive to electrostatic discharges; Awareness of risks & possible damage, component & personnel anti-static protection devices.	1	2	2
5.13 Software Management Control	A	B1	B2
Awareness of restrictions, airworthiness requirements & possible catastrophic effects of unapproved changes to software programmes.	-	2	2

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	Level		
5.14 Electromagnetic Environment	A	B1	B2
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.	-	2	2
5.15 Typical Electronic / Digital Aircraft Systems	A	B1	B2
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 Note : Different manufacturers may use different terminology for similar systems.	-	2	2