

## Module 5. Digital Techniques/Electronic Instrument Systems

	Level				
	A	B1-1 B1-3	B1-2 B1-4	B2	B3
<b>5.1 Electronic Instrument Systems</b> Typical systems arrangements and cockpit layout of electronic instrument systems.	1	2	2	3	1
<b>5.2 Numbering Systems</b> Numbering systems: binary, octal and hexadecimal; Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa.	-	1	-	2	-
<b>5.3 Data Conversion</b> Analogue Data, Digital Data; Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types.	-	1	-	2	-
<b>5.4 Data Buses</b> Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications. Aircraft Network/Ethernet.	-	2	-	2	-
<b>5.5 Logic Circuits</b>					
(a) Identification of common logic gate symbols, tables and equivalent circuits; Applications used for aircraft systems, schematic diagrams.	-	2	-	2	1
(b) Interpretation of logic diagrams.	-	-	-	2	-
<b>5.6 Basic Computer Structure</b>					
(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 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.	-	-	-	2	-
<b>5.7 Microprocessors</b>	-	-	-	2	-

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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.					
<b>5.8 Integrated Circuits</b>  Operation and use of encoders and decoders;  Function of encoder types;  Uses of medium, large and very large scale integration.	-	-	-	2	-
<b>5.9 Multiplexing</b>  Operation, application and identification in logic diagrams of multiplexers and demultiplexers.	-	-	-	2	-
<b>5.10 Fibre Optics</b>  Advantages and disadvantages of fibre optic data transmission over electrical wire propagation;  Fibre optic data bus;  Fibre optic related terms;  Terminations;  Couplers, control terminals, remote terminals;  Application of fibre optics in aircraft systems.	-	1	1	2	-
<b>5.11 Electronic Displays</b>  Principles of operation of common types of displays used in modern aircraft, including Cathode Ray Tubes, Light Emitting Diodes and Liquid Crystal Display.	-	2	1	2	1
<b>5.12 Electrostatic Sensitive Devices</b>  Special handling of components sensitive to electrostatic discharges;  Awareness of risks and possible damage, component and personnel anti-static protection devices.	1	2	2	2	1
<b>5.13 Software Management Control</b>  Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programmes.	-	2	1	2	1
<b>5.14 Electromagnetic Environment</b>  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	2	1
<b>5.15 Typical Electronic/Digital Aircraft Systems</b>  General arrangement of typical electronic/digital aircraft systems and associated BITE (Built In Test Equipment) such as:  (a) For B1 and B2 only:	-	2	2	2	1

	Level				
	A	B1-1 B1-3	B1-2 B1-4	B2	B3
ACARS-ARINC Communication and Addressing and Reporting System EICAS-Engine Indication and Crew Alerting System FBW-Fly-by-Wire FMS-Flight Management System IRS-Inertial Reference System; (b) <i>For B1, B2 and B3:</i> ECAM-Electronic Centralised Aircraft Monitoring EFIS-Electronic Flight Instrument System GPS-Global Positioning System TCAS-Traffic Alert Collision Avoidance System Integrated Modular Avionics Cabin Systems Information Systems.					