6.2.4	Describe a typical retraction test after undercarriage servicing. This should include the following activities: a. Positioning the aeroplane b. Safety placards c. Power supplies d. Checking and adjusting safety devices/switches e. Retraction and extension sequencing and timing f. Checking door clearances and sequencing g. Travel and locking h. Adjustments i. Control operation and cockpit indication j. Alignment	1
6.2.5	Determine typical landing gear system faults from wiring diagrams.	2
6.3	**Wheels, Tyres and Tubes** *Study Ref. 2 & 4*	
6.3.1	Describe the construction of new and retreaded aeroplane tyres, identify them by their markings, and state their applications.	2
6.3.2	Describe the following factors in respect of aircraft tyres: a. Types of tread pattern b. Tyre size classification c. Tyre construction d. Speed limits e. Identification and markings f. Pressures g. Valves h. Safety devices i. Inflation j. Inspection and maintenance practices	2
6.3.3	Describe the various types of wheel assembly used on aeroplane, and state their application.	2
6.3.4	Describe the types of wheel componentry including, bearings, grease and dust seals, spacers and locking devices.	2
6.3.5	Specify typical procedures for wheel bearing servicing and adjustment.	1
6.3.6	State how sealing is accomplished on split half wheel assemblies.	2
6.3.7	Specify the procedures and precautions to be observed during the fitment, deflation/inflation and balancing of wheel, tyre and tube assemblies.	2
6.3.8	State the purpose of vent holes in tubeless aeroplane tyres.	2
6.3.9	Explain the use of balance and slip marks and why the valve is located in a particular position relative to the tyre.	2
6.3.10	Determine faults and damage to tyres, including such things as uneven wear and creep.	2
6.3.11	Describe the common maintenance practices associated with the following: a. Nose wheel shimmy damping b. Toe-in c. Toe-out d. Camber (positive and negative)	2

6.3.12	Specify the handling and storage procedures associated with tyres and tubes.	2
6.4	**Aeroplane Brakes** *Study Ref. 2 & 4*	
6.4.1	Describe the construction, function and operation of the following basic braking systems: a. Disc brakes (single) b. Master cylinders c. Compensator valves d. Park brakes e. Single and dual-servo brakes f. Drum brakes	2
6.4.2	State how pad pressure is equalised on single disk brakes.	2
6.4.3	Specify the cause, effects, and rectification of common brake faults including deterioration of brake hoses.	2
6.4.4	Specify common heat dissipation methods in simple aircraft braking systems.	2
6.5	**Maintenance of Aeroplane Brakes** *Study Ref. 2 & 4*	
6.5.1	Describe in general terms the following brake maintenance activities on light aeroplane: a. Bleeding b. Adjusting c. Checking pads for wear d. Oil decontamination e. Deglazing f. Checking discs for buckling, cracks, scoring and wear g. Rectification of; brake binding, uneven wear, slipping, leaking seals and uneven braking effect h. Equalisation of pad/disc pressures	2

7	Fuel Systems	
	ATA 28	
7.1	**Aviation Fuels**	
	Study Ref. 2 & 4	
7.1.1	Describe the following: a. Types, properties and applications of aviation fuels b. Fuel colour coding c. Fuel storage d. Common causes of fuel contamination e. Quality control of fuel including water testing procedures, proprietary test products and test equipment f. Storage life and fuel deterioration g. Fuel dispensers including hydrants, bowsers and hand pumps h. Pressure refuelling precautions i. Refuelling procedures including electrostatic bonding j. Reuse of drained or decanted fuel k. Disposal of fuel l. Drum refuelling precautions m. Fuel compatibility with seals n. Common sources of fuel system contamination o. Preventing/ rectifying fuel system contamination p. Fuel dispenser filtration devices q. Fuel-specific gravity r. Useable and unusable fuel	2
7.2	**Fuel System Components**	
	Study Ref. 2 & 4	
7.2.1	Describe the construction, operation, function, inspection and maintenance of the following fuel system components: a. Filters b. Fuel heaters c. Primers d. Fuel pumps (rotary vane and gear) e. Pumps - auxiliary/booster/ejector/jet f. Strainers g. Tanks (rigid, flexible, integral) cells and associated hardware h. Fuel tank scuppers and baffle plates i. Check valves, non return valves, flapper valves and cocks j. Fuel pipes and hose assemblies k. Drains, water drains, sumps, and stack/stand pipes l. Flow meters m. Contents/pressure indicating and warning systems n. Cross feed, transfer and dump devices and systems o. Refuelling, defuelling and dump valves p. Fuel tank venting systems	2
7.3	**Fuel Tanks**	
	Study Ref. 2 & 4	
7.3.1	Describe the construction, operation and maintenance of the following types of fuel tanks: a. Integral fuel tanks b. Detachable fuel tanks c. Internal/external fuel tanks d. Bladder fuel cells	2

7.4	**Fuel System Maintenance** *Study Ref. 2 & 4*	
7.4.1	From given information, identify the location and state the relationship of basic fuel system and cross feed system components for a typical fuel system supplying piston and gas turbine-engine aeroplane. Includes the electrical and instrument interfaces.	2
7.4.2	Describe the following maintenance activities: a. Fuel flow checks b. Fuel transfer checks c. Fuel system and dip stick calibration d. Fuel system decontamination e. Fuel tank/system leak testing and sealing, both internal and external f. Rectification of asymmetric fuel feeding g. Identification marking of fuel lines	2
7.4.3	Explain why the airspaces are interconnected on gravity feed fuel tanks.	3
7.4.4	Describe the operation (electrical and mechanical) of a typical fuel system when feeding an engine and transferring fuel between tanks.	2
7.4.5	Describe the operation of a jet pump in an aeroplane fuel tank.	2
7.4.6	State the reasons a jet pump is used in lieu of an electrical or mechanical driven pump.	1
7.4.7	From given information, describe the effects on engine operation of faults in fuel supply system components.	1
7.4.8	Describe how vapour is removed from the fuel in a centrifugal booster pump.	2
7.4.9	Explain the safety precautions when working inside an aeroplane fuel tank. Includes breathing apparatus, lighting, vapour decontamination, safety lookouts and use of mechanical and electrical tools.	3
7.4.10	Describe the construction, maintenance and installation of bladder type fuel cells and their supporting hardware.	2

8	Heating and Ventilation	
	ATA 21	
8.1	**Temperature Control and Air Distribution**	
	Study Ref. 2 & 4	
8.1.1	Specify the principles of operation, system layout, maintenance requirements and safety precautions relating to the following: a. Ventilation/circulation systems including the purpose of ventilating air b. Exhaust heat exchangers and exhaust gas cabin heating systems c. Combustion heaters (Example Janitrol) d. Valves (including air/fire valves), ducts and controls e. Expansion bellows and supports f. Vapour wick pre-heater elements g. Thermal cut-outs and glow plugs h. Electrical heaters i. Temperature control equipment	2
8.1.2	Specify the essential requirements for the operation of a combustion heater.	2

9	Aeroplane Weight and Balance	
	ATA 8	
9.1	**Theory of Weight and Balance Control for Aeroplanes** *Study Ref. 2, 4 & 7*	
9.1.1	Describe the meaning and application of the following weight and balance terms and show appropriate calculations where required: a. Centre of gravity (CG) b. Aeroplane weight, total weight and empty weight c. Theory of weight and balance d. Weight limitations e. Mean aerodynamic chord (MAC) f. CG design limits g. Aeroplane loading aspects h. Aeroplane operating weight i. Overloaded aeroplane j. Empty weight CG range k. Useful load and loading for unaffected C of G l. Arm m. Datum/reference datum n. Main wheel centreline o. Moments (positive and negative) and total moment. Includes calculation of the moment of an item about the datum p. Total moment q. Aeroplane weighing configuration r. Weighing points s. Minimum fuel requirements t. Zero fuel weight u. Unusable fuel and oil v. Ballast w. Shifting weight x. Adverse-loaded CG y. Forward/rearward adverse-loading check z. Extreme condition check aa. Maximum gross weight check bb. Maximum takeoff weight cc. Maximum landing weight dd. Ramp weight ee. Tare weight ff. Fluid levels gg. Installed equipment	2
9.1.2	Apply the formulae for making weight and balance calculations as follows: a. Calculation of ballast required to shift C of G by a specified amount b. Location of C of G for nose and tail wheel aeroplanes c. Empty weight changes d. Percentage of MAC e. Calculation of moments f. Shifting weight g. Addition and removal of equipment or ballast	2

10	Equipment and Furnishings	
	ATA 25	
10.1	**Emergency and Role Equipment**	
	Study Ref 2, 4 & 5	
10.1.1	Specify the principles of operation, precautions, installation and maintenance requirements for the following equipment and furnishings: a. Life jackets b. Life rafts, dinghies and slides c. First aid kits and crash axes d. Emergency floatation equipment e. Portable fire extinguishers f. Emergency Locator transmitters g. Cargo handling and retention devices h. Seats, seatbelts, harnesses (passengers and crew) i. Fire and smoke detection and warning systems j. Fire extinguisher squibs and pyrotechnics k. Floats, skis, panniers and stretchers l. Loud hailers	1

11	**Ground Servicing**	
	ATA 5 & 7	
11.1	**Aeroplane Inspection**	
	Study Ref. 2 & 4	
11.1.1	Describe the various routine and special servicings commonly performed on aeroplane and define associated terms.	2
11.1.2	Describe lifting of components.	2
11.2	**Jacking and Levelling**	
	Study Ref. 2 & 4	
11.2.1	Explain the following criteria in regard to jacking and levelling an aeroplane: a. Jacking points b. Jacking procedures c. Maintenance of jacks d. Use of levelling equipment e. Identification of levelling points f. Levelling to the flying position	2
11.3	**Testing of Aeroplanes After Maintenance**	
11.3.1	Specify the requirements for ground and flight-testing of aeroplanes.	1