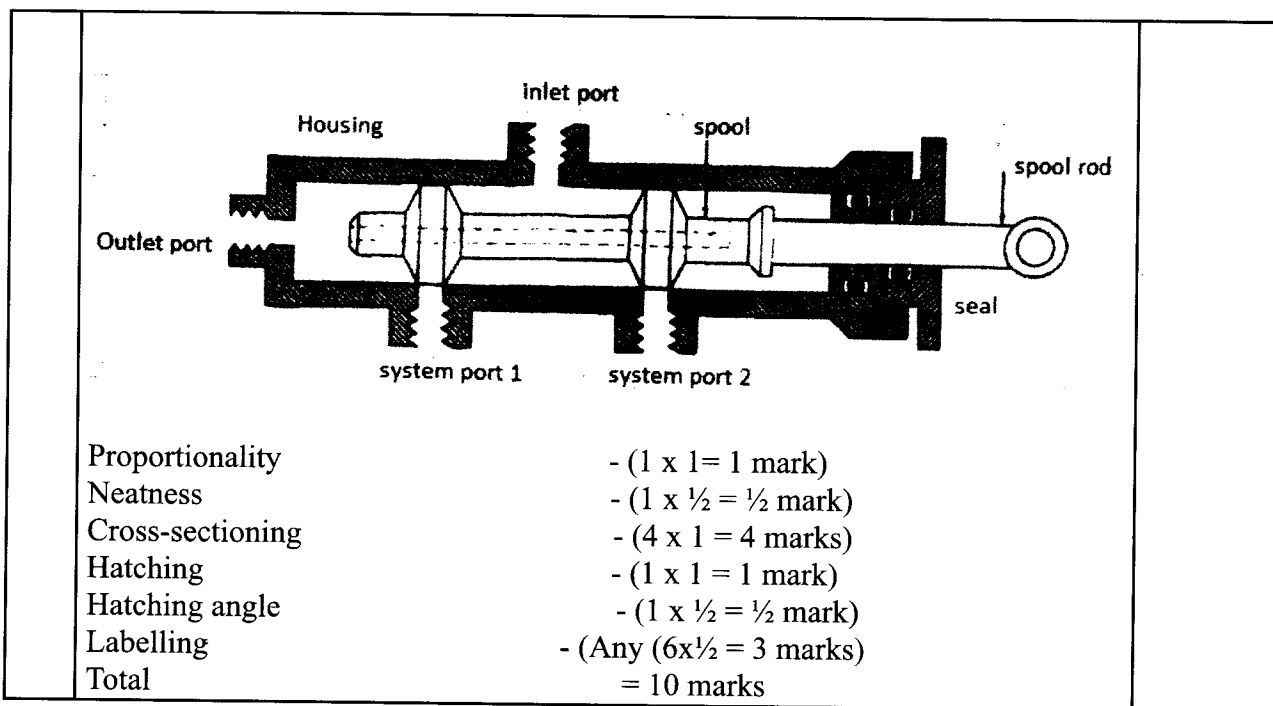


4.22.2 Aviation Technology Paper 2 (450/2)

STATION 1

MARKING SCHEME



STATION 3

(a)	Parts: A. Wire twister B. Graphite grease <div style="text-align: right;">(2 x ½ = 1 mark)</div>	(1 mark)
(b)	(i) Ensuring the nuts are locked as a safety factor (ii) For lubrication <div style="text-align: right;">(2 x ½ = 1 mark)</div>	(1 mark)
(c)	(i) Identify part – Hub assembly (ii) State type – split half <div style="text-align: right;">(2 x ½ = 1 mark)</div>	(1 mark)
(d)	(i) Red – corroded wheel Green – damaged hub White – ‘O’ ring cut Blue – balance weight missing <div style="text-align: right;">(4 x ½ = 2 mark)</div> (ii) White – Sealing to enable air tight joint Blue – to match the heavy and light parts of the hub and out- er cover. <div style="text-align: right;">(2 x ½ = 1 mark)</div>	(2 marks) (1 mark)

(e)	Checks: - Signs of cracks - Signs of corrosion Rejection - Wear due to corrosion - Bending - Cracks (4 x ½ = 2 marks)	(2 marks)
-----	--	-----------

STATION 4

(a)	(i) Gyroscopic precision (ii) Navigator (2 x ½ = 1 mark)	
(b)	(i) Observations - The bourdon tube tends to straighten to move the gear mechanism. (ii) Reason The outside part of the bourdon has a bigger service area and thus under same pressure, the bourdon tube tends to straighten. (iii) Principle: Area differential (iv) Application: System pressure indication (4 x 1 = 4 marks)	
(c)	(i) Observation: The bellows expand and contract, moving the gear mechanism. (ii) Reason: The bellows expand under pressures but remain stationary under static pressure condition. (iii) Principle: Pressure differential (iv) Application: Airspeed indication system (4 x 1 = 4 marks)	
(d)	Comparison: A requires more pressure to move the gear assembly than B. (1 x 1 = 1 mark)	

STATION 5

(a)	(i) Bearing (ii) Tapered roller bearing (iii) To take both axial and radial loads (iv) Determined how much axial and radial load the bearing can sustain. (4 x ½ = 2 marks)	(2 marks)
(c)	Rejection criteria for part E (i) Excessive play/wear (ii) Corrosion (iii) Overheating (iv) Scratches (4 x ½ = 2 marks)	(2 marks)

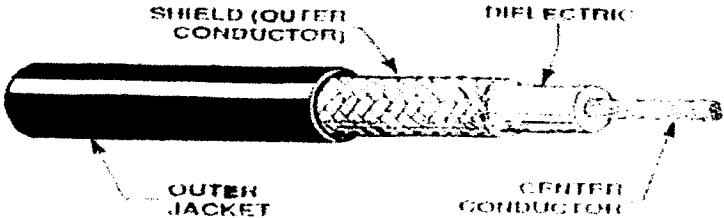
STATION 6

(a)	<ul style="list-style-type: none"> (i) Torque wrench (ii) Tightening the bolts and nuts to the torque to avoid over torqueing and under torqueing. (iii) Calibration (iv) Ratchet type <p style="text-align: right;">(4 x ½ = 2 marks)</p>	
(b)	<ul style="list-style-type: none"> (i) Engine oil pump (ii) Spur gear (iii) Engine oil system <p style="text-align: right;">(3 x ½ = 1½marks)</p>	
(c)	<ul style="list-style-type: none"> (i) G - Pump casing H - Driving impeller J - Driver's impeller K - Idler shaft L - Pump drive shaft <p style="text-align: right;">(5 x ½ = 2½ marks)</p>	
	<ul style="list-style-type: none"> (ii) White - Locking dowel\ Blue - Plug <p style="text-align: right;">(2x ½ = 1 mark)</p> <ul style="list-style-type: none"> (iii) G - Cracks and wear J - Splints wear and breakage/overheat K - Play on driven impeller L - Roundness and parallelism <p style="text-align: right;">(4 x ½ = 2 marks)</p>	
(d)	<ul style="list-style-type: none"> - Low engine oil pressure - Engine over heating - Engine failure - Vibrations <p style="text-align: right;">(2 x ½ = 1 mark)</p>	

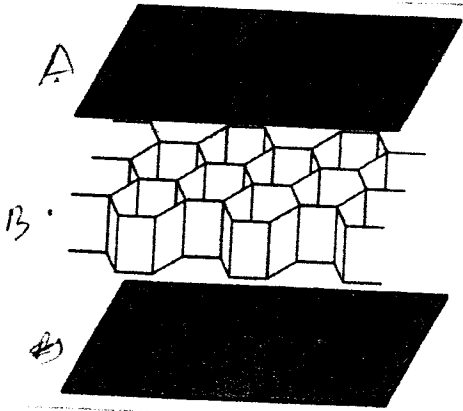
STATION 7

(a)	<ol style="list-style-type: none"> 1. Wheel brake assembly 2. Disk type 3. Landing gear system 4. Light aircraft <p style="text-align: right;">(4 x ½ = 2 marks)</p>	(2 marks)
(b)	<ol style="list-style-type: none"> (i) <ol style="list-style-type: none"> White - Cylindrical head Blue - Piston Red - Linings Green - Gasket <p style="text-align: right;">(4 x ½ = 2 marks)</p> 	(2 marks)
	<ol style="list-style-type: none"> (ii) Defects <ul style="list-style-type: none"> - Disk scratched or corroded - Linings worn out - Seal cut - Piston cylinder bore scratched - Piston spring missing <p style="text-align: right;">Any (2 x ½ = 1 mark)</p> 	
(c)	<ul style="list-style-type: none"> - Ensure the disk is not cracked or overheated. - Ensure no signs of leakage - Ensure unit properly fitted and secured - Ensure no signs of brake binding or malfunction <p style="text-align: right;">(4 x ½ = 2 marks)</p>	

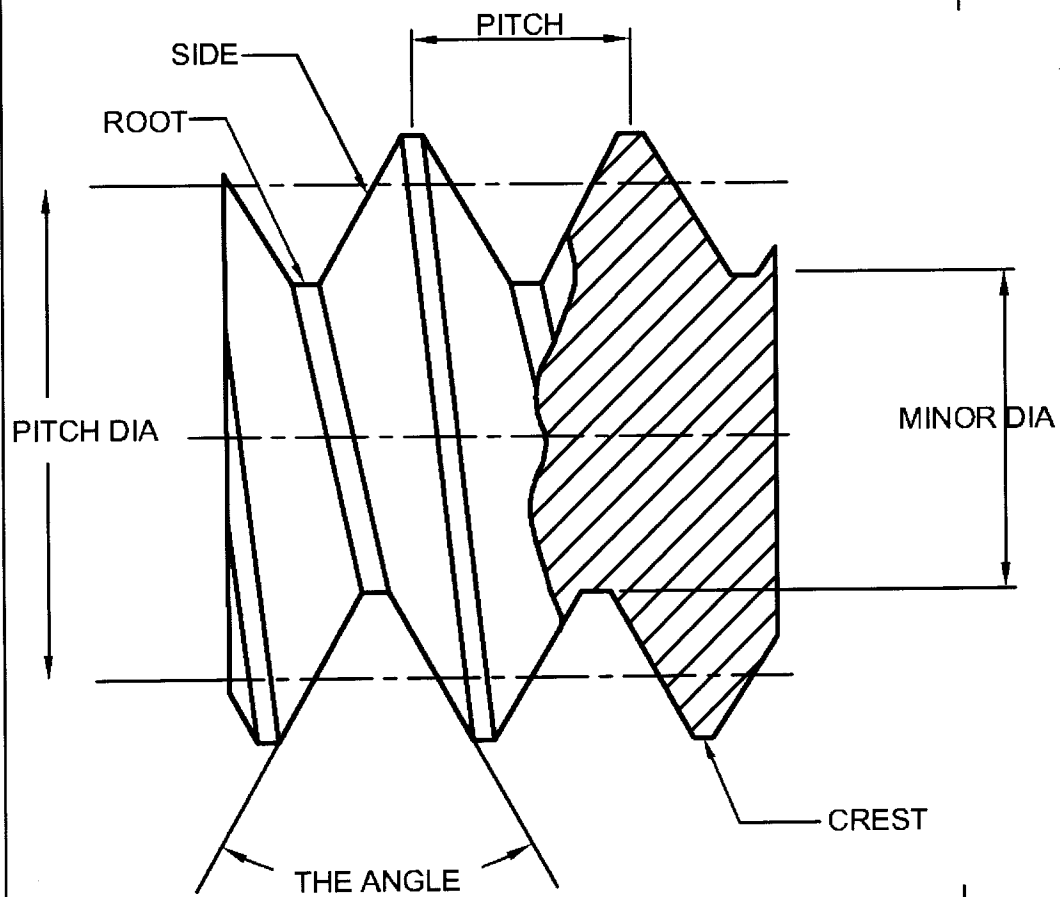
STATION 8

(a)	 <p>Correct stripping = $(4 \times \frac{1}{2} = 2 \text{ marks})$ Labelling = $(4 \times \frac{1}{2} = 2 \text{ marks})$</p>	
(b)	<p>Use:</p> <ul style="list-style-type: none"> (i) Radio antennae cables (ii) Fuel quantify cables <p style="text-align: right;">$(2 \times \frac{1}{2} = 1 \text{ mark})$</p>	

STATION 9

(a)	<ul style="list-style-type: none"> (i) Composite. (ii) Used where weight to strength ration is necessary. (iii)  <p>A – Face sheet B – Honey comb core</p> <p>Sketch – $(1 \times 1) = 2 \text{ marks})$ Labelling – $(2 \times \frac{1}{2} = 1 \text{ mark})$</p>	<p>$(1 \times \frac{1}{2} = \frac{1}{2} \text{ mark})$ $(1 \times \frac{1}{2} = \frac{1}{2} \text{ mark})$</p>
-----	---	---

b.	(i) Bolt	(1 x ½ = ½ mark)
	(ii) Damaged head thus must be rejected.	(1 x ½ = ½ mark)
	(iii)	



Sketch – (1 x 2 = 2 marks)

Labelling – Any (6 x ½ = 3 marks)

STATION 10

(a)	(i) Sample data (ii) Sample data	(2 x 1 = 2 marks)
(b)	(i) Sample data (ii) Sample data	(2 x ½ = 3 marks)
(c)	(i) Though parts S and T are of the same size, the weight on the weighing scale was different. - Thus T is denser than S. (ii) T displaced more volume of water than S	(2 x 1 = 2 marks)
(d)	(i) Archimedes principle. (ii) The buoyant force exerted on a body immersed in a fluid is equal to the weight of the fluid the body displaces. (iii) - Only balloons - Sea planes (iv) Sea planes	(2 x 1 = 2 marks) 2 x ½ = (1 mark)

10 x 1 = 10 marks