

5.8.2 Aviation Technology Paper 2 (450/2)

STATION 1

Sketch Neatness Assembly Main parts	- 1 x 1 = 1 mark - 1 x 1 = 1 mark - 6 x 1 = 6 marks - 4 x ½ = 2 marks

STATION 3

3 (b)	(i)	Voltage	236 – 250v		
	(ii)	Voltage	236 – 250v		<b>(1 mark)</b>
				(2 x ½ = 1 mark)	
	(c)	(i)	Voltage 236 – 250v		
				(1 x ½ = ½ mark)	<b>(½ mark)</b>
		(ii)	The motor speed increases and bell ringing intensity increases		
				(1 x 1 = 1 mark)	<b>(1 mark)</b>
		(iii)	The motor speed reduces and the bell ringing intensity decreases.		
				(1 x 1 = 1 mark)	<b>(1 mark)</b>
		(iv)	Voltage – 110 – 120 volts		
				(1 x ½ = ½ mark)	<b>(½ mark)</b>

d	(i) The power increases from 110 – 240 volts and thus the variation of motor.  <p style="text-align: right;">(1 x ½ = ½ mark)</p>	<b>(½ mark)</b>
	(ii) Emergency audio warning. – Power step down for various components  <p style="text-align: right;">(2 x 1 = 2 marks)</p>	<b>(2 marks)</b>
e	A – Switch B – AC step down transformer C – AC motor with level mechanism D – bell or gang  <p style="text-align: right;">(4 x ½ = 2 marks)</p>	<b>(2 marks)</b>

#### STATION 4

a)

- (i) Bearing
- (ii) Tapered roller bearing
- (iii) To take both axial and radial loads
- (iv) Determine how much axial and radial load the bearing can sustain

**(4 x ½ = 2 marks)**

b)

- (i) Sample Data
- (ii) Sample Data
- (iii) Sample Data
- (iv) Sample Data
- (v) Sample Data
- (vi) Sample Data

**(6 x 1 = 6 marks)**

c)

- (i) Excessive play or wear
- (ii) Corrosion
- (iii) Overheating
- (iv) Scratches or cracks

**(4 x ½ = 2 marks)**

**STATION 5**

(a)	(i) Torque wrench (ii) Tightening the nuts and bolts to the torque to avoid over torquing or under torquing (iii) Calibration (iv) Ratchet  <b>(4 x ½ = 2 marks)</b>	<b>(2 marks)</b>
(b)	(i) Engine oil pump (ii) Spur gear type (iii) Lubrication system, Hydraulic system  <b>(3 x ½ = 1½marks)</b>	<b>(1½marks)</b>
(c)	(i) G – Pump Casing H – Impeller gear J – Driver gear K – Idler shaft L – Drive shaft  <b>(5 x ½ = 2½marks)</b>	<b>(2½marks)</b>
	(ii) White – Filling Port Blue – Locking  <b>(2 x ½ = 1 mark)</b>	<b>(1 mark)</b>
	(iii) G – Cracks and wear J – Play on spur gear, wear, cracks etc. K – Play on driven impeller, gear wear L – Parallelism of the shaft and play.  <b>(4 x ½ mark)</b>	<b>(2 marks)</b>
(d)	(i) Engine overheating (ii) High temperature indication  <b>(2 x ½ mark)</b>	<b>(1 mark)</b>

**STATION 6**

(a)	M – The instrument is marked A51 and readings are in knots and two ports  N – The instrument reading are in PS1 with range markings and one port.  <b>(2 x ½ = 1 mark)</b>	<b>(1 mark)</b>
(b)	(i) M – Pressure differential N – Area differential  <b>(2 x ½ = 1 mark)</b>	<b>(1 mark)</b>
	(ii) M – Capsule N – Bourden tube  <b>(2 x ½ = 1 mark)</b>	<b>(1 mark)</b>

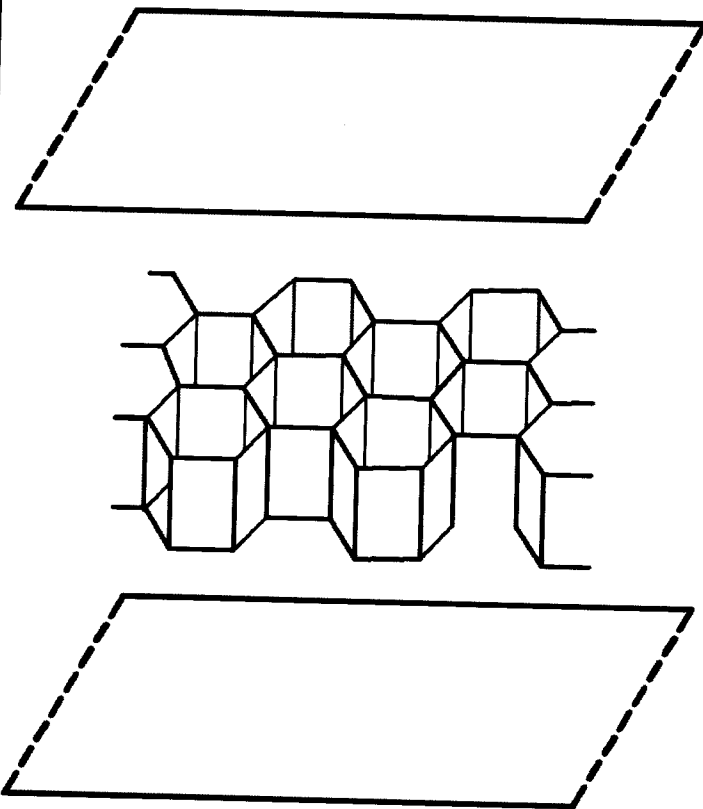
	(iii) M – More sensitive to any changes N – Requires more forces to input changes (2 x ½ = 1 mark)	(1 mark)
	(iv) <b>Part</b> a) Pointer b) Segmented gear c) Drive pinion d) Compensator e) Graduated scale <b>Function</b> to indicate reading drive the points To transmit motion from segmented gear to pointed To allow for contraction and expansion To show the information in connection with the (Any 4 x 1= 4 marks)	(4 marks)
	(v) M – Navigation N – Engine (2 x ½ = 1 mark)	(1 mark)
	(i) Firmness of instrument (ii) Legibility of dial markings (iii) Presence of moisture inside the glass; which indicates a case leak. (2 x ½ = 1 mark)	(1 mark)

### STATION 7

(a)	(i) Brake unit (ii) Single disc brake (iii) Landing gear brake system (iv) Ultra-light aircraft (4 x ½ = 2 marks)	(2 marks)
(b)	(ii) White – Cylinder head Blue – Piston Red – Linings Green - Gasket (4 x ½ = 2 marks)	(2 marks)
	(iii) 1. Missing Piston Spring 2. Linings worn out 3. Seal cut 4. Piston cylinder more scratched (4 x ½ = 2 marks)	(2 marks)

	(i) Ensure the disc is not cracked or overheated (ii) Ensure no leakage is evident (iii) Ensure unit properly fitted and secured (iv) Ensure no brake binding or malfunction	
(4 x ½ = 2 marks)		(2 marks)

**STATION 8**

(a)	<p>(i) Composite material (ii) Used where weight to strength ratio is necessary</p> <p align="right">(2 x ½ = 1 mark)</p> <div style="text-align: center;">  </div> <p>A - Face Sheet B - Honey Comb Core</p> <p>A – Face sheet B – Honey comb core</p> <p>Sketch – 1 x 2 = 2 marks Labelling – 2 x ½ = 1 mark</p>	<p align="center">(1 mark)</p> <p align="center">(3 marks)</p>
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(b)	(i) Bolt	(2 marks)
	(ii) The bolt head corners have slipped ends thus unserviceable for use on an aircraft	
	<b>(2 x ½ = 1 mark)</b>	
	Correct sketch of a screw threads = 2 marks	
	Correct labelling of the thread = 2 marks	
	<b>Total = 4 marks</b>	<b>(2 marks)</b>

**STATION 9**

- (a)
- (i) Landing and taxing lights
  - (ii) Follow me car
  - (iii) Signs and
  - (iv) Heading indicators
- (4 x ½ = 2 marks)**

**STATION 10**

- (a)
- (i) Sample data
  - (ii) Sample data
- (2 x 1 = 2 marks)**
- (b)
- (i) Sample data
  - (ii) Sample data
- (2 x 1 = 2 marks)**
- (c)
- (i) Though past U and V are of the same size, the weight on the weighing scale is different.
  - (ii) V displace more water than U
  - (iii) Archimedes Principle, a body in fluid displaces fluid equal to its weight
  - (iv) Balloons
  - (v) Sea planes
- (5 x ½ = 2 ½ marks)**

(d)

Data Given	Expected Response
Span	Sample Data
Chord	Sample data
Density	1.225kgm <sup>3</sup>
Velocity (v)	69.4 m/sec
Formula	½ PV <sup>2</sup> Sc l
Wing Area	Sample data
Lift	Sample data

**(7 x ½ = 3½ marks)**