4.10.2 Aviation Technology Paper 2 (450/2)

STATION 1

The bracket provided represents an aircraft part.

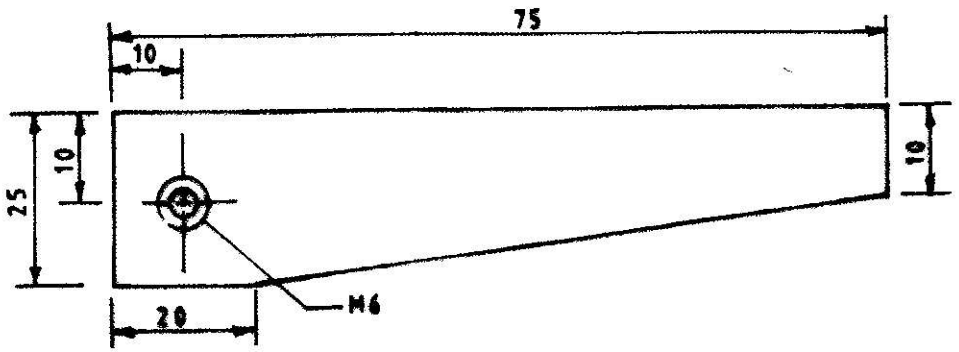
(a) On the drawing paper provided, draw the isometric view of the bracket taking X as the lowest point.

(b) Measure and record the following dimensions:

(i) overall length;
(ii) width;
(iii) height. (10 marks)

STATION 2

Using the tools, materials and equipment provided make the locking dowel as shown in the figure below. (10 marks)



STATION 3

(a) The parts labelled J, K and L are defective due to corrosion. Complete the table below by:

(i) naming each part;
(ii) stating the cause and remedy for each defect;
(iii) indicating where the defect is likely to occur in an aircraft. (4 ½ marks)

PART	CAUSE	REMEDY	AREA LIKELY TO OCCUR
J			
K			
L			

(b) Study the cross-section of the aircraft tyre provided and:
(i) name the parts labelled M, N, P, Q and R;
(ii) state the function of each part;
(iii) state one rejection criteria on the part marked M. (5 ½ marks)

SECTION 4

(a) (i) Identify the instrument labelled X.

X .....

(ii) Take and record the readings on the instrument.

.....

..... (2 ½ marks)

(b) Remove the cover of the instrument and complete the table below:

PART PAINTED	NAME	FUNCTION
BLUE		
WHITE		
YELLOW		
BLACK		

(4 marks)

(c) State:

(i) its principle of operation; .....

(ii) its limitations; .....

(iii) reason for its limitations. .....

(1 ½ marks)

(d) (i) Identify **two** defects on the instrument

(ii) Give **two** requirements for its maintenance

.....

..... (2 marks)

(e) Replace the cover.

STATION 5

(a) Using the apparatus, materials and equipment provided, carry out the following tasks.

(i) Heat the metallic strip on one face and record your observations.

.....

(ii) Quench the strip in the water and record what happens.

.....

(iii) Heat the metallic strip on the other face and record your observations.

.....

(iv) Quench the strip in the water and record what happens.

.....

(v) State the reasons for:

(i) and (iii) above; .....

.....

(ii) and (iv) above. .....

.....

(vi) Relate your observations to **two** system in an aircraft.

.....

.....

(6 marks)

(b) (i) Name the aircraft components labelled X, Y and Z and state the function of each.

X .....

.....

Y .....

.....

Z .....

.....

(ii) State the common maintenance requirement for X and Y.

.....

(4 marks)

STATION 6

Using the tools and component B provided, perform the following tasks:

(a) (i) identify component B;

.....

(ii) state the engine system where it is used;

.....

(iii) state the number of cylinders for the component.

..... (1 ½ marks)

(b) Measure and record:

(i) the depth of the hole painted white;

.....

(ii) the distance between lobe C and D;

.....

(iii) the diameter of the journal labelled E;

.....

(iv) the height of the cam lobe labelled F. (4 marks)

(c) (i) Count the number of teeth on the part labelled G.

.....

(ii) Name the type of gears on the part labelled G

.....

(iii) Indicate the method of locking of part G to the shaft. (3 marks)

.....

(d) Give **three** causes of the defect on the part labelled E.

.....

.....

.....

(1 ½ marks)

STATION 7

The set-up provided is an aircraft harness with terminals labelled A to H on one end and terminals labelled 1-8 on the other end.

(a) Using the tester provided, check the continuity between the terminals and match them accordingly and complete the following table. (8 marks)

TERMINAL	MATCHING TERMINAL
A	
B	
C	
D	
E	
F	
G	
H	

(b) Comment on the condition of each of the following terminals: (2 marks)

B .....

D .....

G .....

H .....

STATION 8

(a) Identify and record two design features of the aircraft models labelled A and B. (2 marks)

.....

.....

(b) Using the models labelled A, B and C, demonstrate to the examiner the following ground operations:

(i) towing model A;

(ii) towing model B;

(iii) debogging model A;

(iv) debogging model B;

(v) turning left for A;

(vi) turning left for B;

(vii) turning right for A;

(viii) turning right for B;

(ix) take off for A;

(x) take off for B. (5 marks)

(c) (i) using the tools provided, measure and record the following in model A.

Span .....

Chord .....

(ii) Determine the following:

wing area;

aspect ratio. (3 marks)

STATION 9

On the propeller blade provided, perform the following tasks.

(a) Measure and record the station of the lines marked 1 and 2. (2 marks)

1 .....

2 .....

(b) Identity:

(i) the side marked 3; .....

(ii) the side marked 4; .....

(iii) the part painted red; .....

(iv) the part painted blue. .....

(2 marks)

(c) Study the defects marked 5 and 6 and complete the table below.

MARK	DEFECT	REPAIR	SKETCH	PRECAUTION
5				
6				

(5 marks)

(d) Give **two** preventive maintenance required on the blade.

.....

..... (1 mark)

STATION 10

(a) Using the chain and the set-up provided, perform the following tasks.

(i) Identify the type of chain

.....

(ii) Mount the chain on the set-up with the pinion at the following positions and in each case record your observations.

A Observations .....

.....

B Observations .....

.....

C Observations .....

.....

(iii) From the observations in (a) (ii) above, determine the appropriate position for the set-up and state **two** reasons for your choice.

Position: .....

Reasons .....

.....

(iv) Remove the chain from the set-up and count and record the number of teeth on:

pinion gear; .....

sprocket gear. .....

(v) Determine the velocity ratio of the set-up.

.....

.....

(9 marks)

(b) Relate the experiment to two aircraft systems.

.....

.....

(1 mark)