

3.22.2 Aviation Technology Paper 2 (450/2)

STATION 1

INSTRUCTIONS

Figure 1 shows parts of a fan engine.

- (a) In the space provided, sketch in good proportion the assembled engine. (7 marks)
- (b) Label six parts. (3 marks)

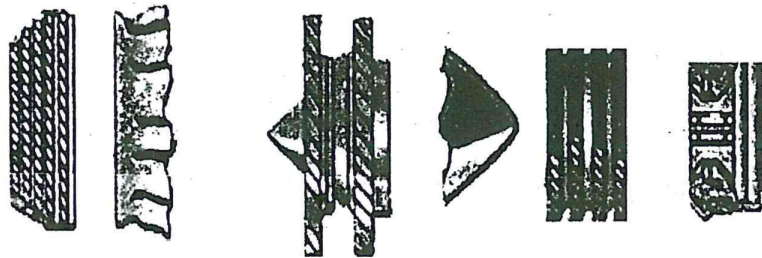


Figure 1

STATION 2

INSTRUCTIONS

Using the tools, equipment and materials provided, make the drive key as shown in figure 2.

(10 marks)

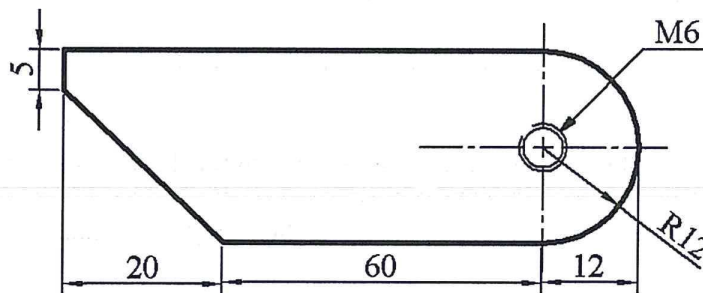


Figure 2

STATION 3

INSTRUCTIONS

Using the tools and components provided, carry out the following tasks:

- (a) (i) Check and record the block top surface for warpage gap and condition.
Gap size
Condition
- (ii) Name the tools used.
Tools
- (iii) State **one** safety precaution to observe in (a)(i). (3 marks)
- (b) (i) Check and record the condition of the cylinder wall.
Condition
- (ii) Give the recommendation based on the results in (b)(i) above.
Recommendations (2 marks)
- (c) (i) Measure and record the internal diameter of the bore at points X, Y and Z.
X Y Z (3 marks)
- (ii) From the size of diameters in (c)(i) above, determine the size of the bore and cylindricity.
Bore Cylindricity (1 mark)
- (iii) Basing on the results in (c)(i) and (c)(ii) above, give recommendations. (1 mark)

STATION 4

INSTRUCTIONS

- (a) Identify and state the application of each of the parts of aircraft hydraulic system labelled 1–4. Complete the table provided.

Part	Identification	Application
1		
2		
3		
4		

(4 marks)

- (b) Measure and record the size of pipes labelled 5 and 6.

(i) Size of pipe 5 (ii) Size of pipe 6
 (2 marks)

- (c) Identify **two** defects on each of the pipes in (b) above.

(i) Defects on pipe 5
 (ii) Defects on pipe 6
 (2 marks)

- (d) State **two** serviceability checks that must be carried out on item 6 before fitting on an aircraft.

(1 mark)

- (e) Identify the system where each of the pipes in (b) are used.

Pipe 5

Pipe 6

(1 mark)

STATION 5

INSTRUCTIONS

Using the materials and equipment provided, carry out the following tasks:

(a) Switch on the air compressor and allow pressure to build up to about 10 bars. Open the air flow valve marked **R** slowly and hold the hose labelled **T** vertically so that the stream of gases are directed straight up. Let the examiner check the set up. (1 mark)

(b) (i) Release the ping-pong ball marked **S** into the stream of air 30 centimetres from the nozzle. Record your observations.
Observations

(ii) Slowly tip the nose so that air shoots out an angle. Record the observations.
Observations

(iii) Repeat (b)(ii) with increased air pressure. Record the observation.
Observations

(iv) State **three** reasons behind your observation in (b)(i) to (b)(iii).
Reasons (6 marks)

(c) State:

(i) Where the principle is applicable in flight.
Application

(ii) **Two** weather factors that can affect the observations in (b).
Factors:
(I)
(II) (3 marks)

STATION 6

INSTRUCTIONS

An aircraft is to be flown from point **E** to **P** eastwards. The wind speed at the altitude of the intended flight is 45 knots from the northeast, while the true airspeed of the aeroplane is 120 knots.

Using the drawing instruments and the plain paper provided, carry out the following tasks.

- (a) Construct in **four** steps a wind triangle for navigation purposes. (8 marks)
- (b) Measure and record the true heading by direct measurement and wind correction angle.
 - (i) Direct measurement
 - (ii) Wind correction angle (2 marks)

STATION 7

INSTRUCTIONS

- (a) Drop the ball marked **Z** in the jar labelled 10.
 - (i) Record your observation
Observation
 - (ii) State the reasons behind your observation
Reasons
 - (iii) Explain the principle behind your observation
Principle
 - (iv) State **two** areas where applicable in an aircraft.
Applications (4 marks)
- (b) Using the materials provided, make each of the following aircraft wing plan forms:
 - (i) Elliptical
 - (ii) Delta
 - (iii) Sweepback
 - (iv) Rectangular (4 marks)

(c) State **one** application for each wing plan form in (b).

Elliptical

Delta

Sweepback

Rectangular

(2 marks)

STATION 8

INSTRUCTIONS

(a) Study the instrument labelled 1 and identify the following:

(i) Principle of operation

(ii) Aircraft system used.....

(1 mark)

(b) Using the pump and instrument assemblies labelled 2 and 3 carry out the following tasks.

(i) Connect the pump to the instrument assembly labelled 1 and slowly, pressurise. Record the observation.

Observation

(ii) State the reason behind the observation.

Reason

(iii) State the principle behind the observation.

Principle

(iv) State **one** application in an aircraft.

Application.....

(4 marks)

(c) (i) Repeat (a)(i) using the assembly labelled 2. Record the observation.

Observation

(ii) State the reason behind the observation.

Reason

(iii) State the principle behind the observation.

Principle

(iv) State **one** application in an aircraft.

Application.....
(4 marks)

(d) Compare the pressure requirements from observations A and B. (1 mark)

Comparison

STATION 9

INSTRUCTIONS

Using tools and materials provided, carry out the tests listed on the materials labelled **T** and **V** and complete the table below.

Test	Material T	Material V
Colour		
Breaking		
Cutting		
Burning		
Bending		

(10 marks)

STATION 10

INSTRUCTIONS

Using tools, equipment and materials provided construct a circuit that has two cells and two bulbs in series on the bread board provided. (10 marks)