

3.23 AVIATION TECHNOLOGY (450)

3.23.1 Aviation Technology Paper 1 (450/1)

SECTION A (44 marks)

Answer all questions in this section in the spaces provided.

- 1 Outline the following:
- (a) **Four** safety precautions when using electrical equipment. (2 marks)
 - (b) **Two** safety precautions when working on aircraft electrical system. (1 mark)
- 2 (a) State the use of each of the following types of rivets used in aircraft construction:
- (i) Countersunk head rivet,
 - (ii) Mushroom head rivet. (2 marks)
- (b) Explain why aluminium alloy is preferred for use in aircraft construction. (1 mark)
- 3 (a) Highlight **two** functions for each of the following aircraft structural members:
- (i) Frame,
 - (ii) Stringer,
 - (iii) Skin. (3 marks)
- (b) Differentiate between eddy current and ultra-sonic methods of non destructive testing. (2 marks)
- 4 Distinguish between the following as applied in airport operations:
- (a) Flight plan and forecast, (2 marks)
 - (b) Flight and ground visibility. (2 marks)
- 5 (a) Using sketches, explain the operation of each of the following pneumatic system valves:
- (i) Non-return, (2½ marks)
 - (ii) Orifice. (2½ marks)



- 6 (a) Name **four** joining methods used in aircraft construction. (2 marks)
- (b) State **two** advantages for each method in 6(a). (4 marks)
- 7 With the aid of a sketch, describe the three aircraft axes. (5 marks)
- 8 Explain the operation of each of the following jet engine components:
- (a) Compressor, (2 marks)
- (b) Turbine, (2 marks)
- (c) Exhaust. (2 marks)
- 9 Highlight the information given to the aircrew by the air traffic controller. (3 marks)
- 10 Sketch the symbols for each of the following:
- (a) Internal thread, (1 mark)
- (b) Bearing, (1 mark)
- (c) Spring, (1 mark)
- (d) Long hollow tube or shaft. (1 mark)

SECTION B (56 marks)

Answer any four questions from this section. in the spaces provided

- 11 **Figure 1** shows an aircraft locking bracket drawn in isometric projection.
- (a) Draw **Full Size** the following views in third angle projection:
- (i) Front elevation in the direction of arrow F.
- (ii) End elevation,
- (iii) Plan. (10 marks)



(b) Show the major dimensions.

(4 marks)

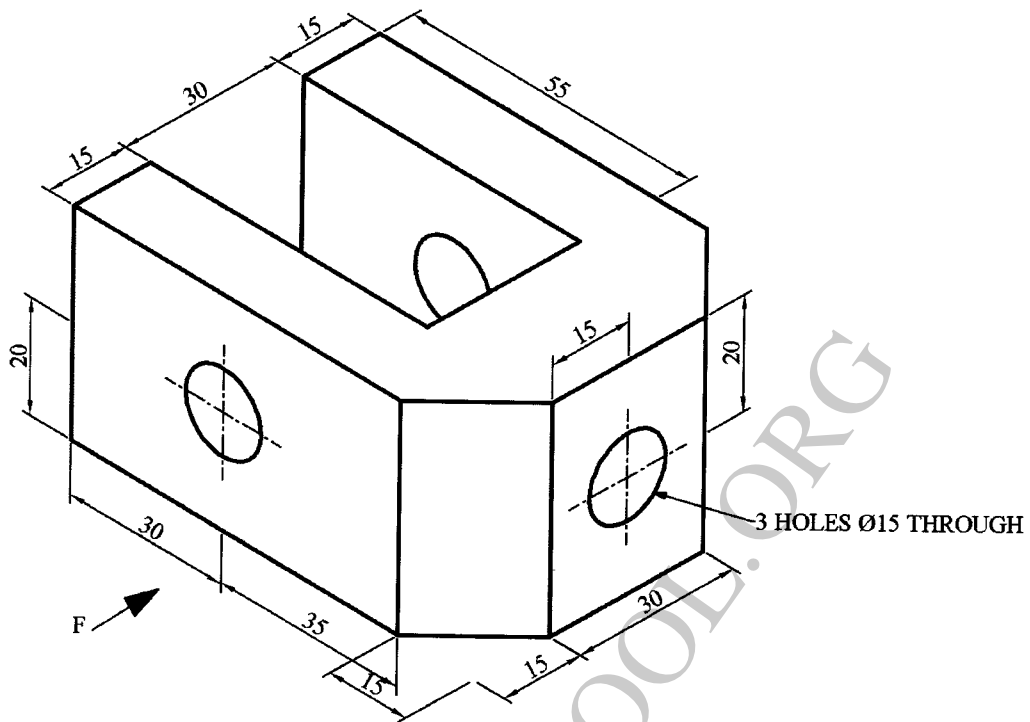


Figure 1

- 12 (a) With aid of a labelled sketch describe the **three** aircraft propeller blade angles during flight. (10 marks)
- (b) Describe the **four** forces which act on a propeller during flight. (4 marks)
- 13 (a) With aid of a labelled schematic diagram, explain the functions of each component of a basic hydraulic system. (12 marks)
- (b) State **four** functions of a hydraulic system accumulator. (2 marks)
- 14 (a) Explain the importance and location of each of the following aircraft crash and rescue equipment:
- (i) Escape slide,
 - (ii) Dinghy,
 - (iii) Life jacket,
 - (iv) Life raft.
- (8 marks)
- (b) With the aid of sketches, show the difference between static and dynamic stability. (6 marks)
- 15 (a) Define each of the following terms as applied in aircraft instrument system:
- (i) Dynamic pressure,
 - (ii) Static pressure.
- (2 marks)
- (b) With the aid of a labelled diagram describe a typical magneto primary circuit used on aeropiston engine.