

29.13 AVIATION TECHNOLOGY (450)

29.13.1 Aviation Technology Paper 1 (450/1)



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SECTION A (40 marks)

Answer ALL the questions in this section.

- 1 (a) State two safety precautions to be observed when cleaning clear perspex panels. (1 mark)
(b) State four functions of the basic aircraft flight instruments. (2 marks)
- 2 (a) State two sources of information concerning aircraft hardware. (1 mark)
(b) State four functions of washers used in aircraft installation. (2 marks)
- 3 Sketch and label the three types of oxy-acetylene welding flames. (3 marks)
- 4 Give three reasons why titanium is best suited for aircraft construction. (3 marks)
- 5 Outline three characteristics of the troposphere atmospheric layer. (3 marks)
- 6 With the aid of a labelled sketch, describe the empennage parts. (6 marks)
- 7 (a) Use a labelled sketch of an aircraft in level flight to show the relationship between centre of gravity and centre of pressure. (2½ marks)
(b) In a level flight, explain how:
(i) the centre of gravity and centre of pressure vary;
(ii) the variation is corrected. (3½ marks)
- 8 (a) State six functions of oil in an aeropiston engine. (3 marks)
(b) Explain the function of each of the following sub-systems in aeropiston oil lubricating system:
(i) scavenge;
(ii) breather. (2 marks)
- 9 (a) Explain the purpose of inlet duct in an aero gas turbine engine. (1 mark)
(b) Outline three differences between single and double entrance inlet ducts. (3 marks)
- 10 Use conventional symbols to illustrate each of the following as used in technical drawing:

- (a) first angle projection;
- (b) solid cylinder;
- (c) machined surface;
- (d) internal screw thread.

(4 marks)

SECTION B (60 marks)

*Answer question 11 and any other three questions from this section.
Candidates are advised to spend not more than 25 minutes on question 11.*

- 11 Figure 1 shows three views of an aircraft door mounting bracket drawn in first angle projection. Draw the isometric view of the bracket taking X as the lowest point.

(15 marks)

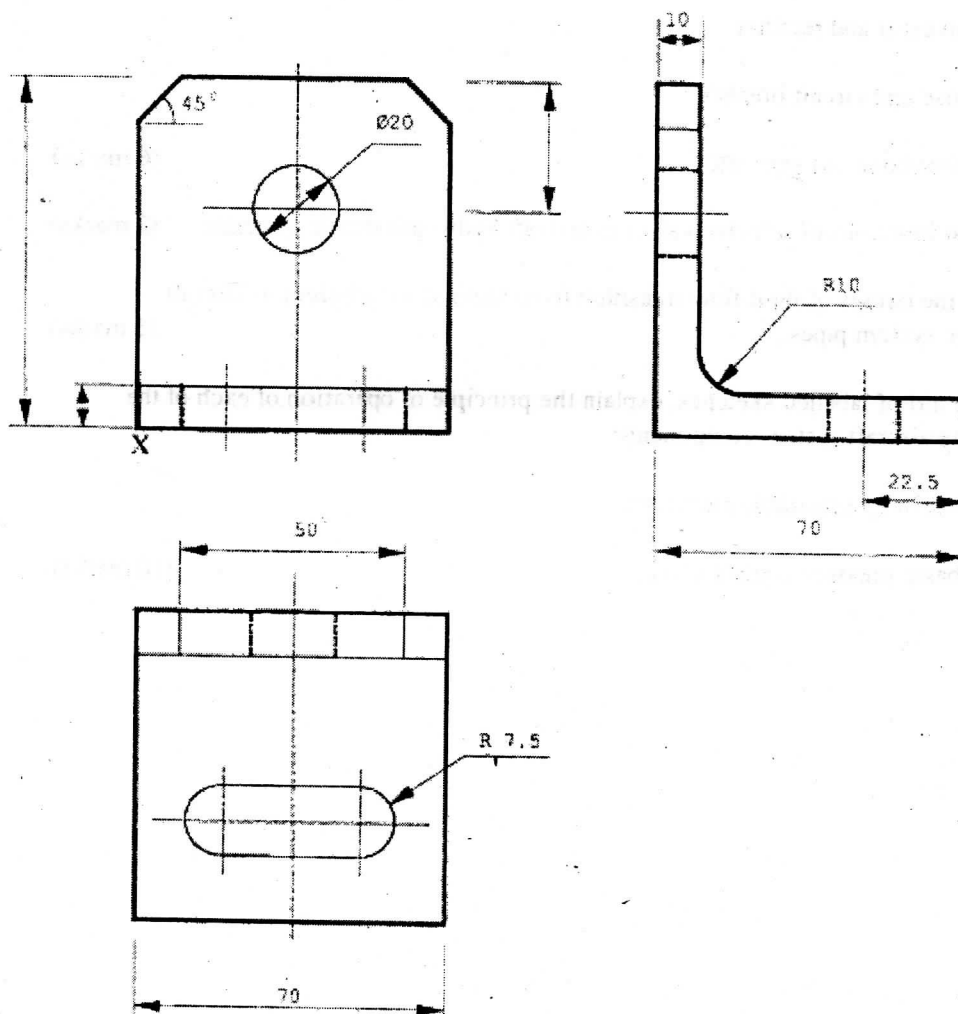


Figure 1

- 12 With the aid of a labelled sketch, explain the operation of an aero bypass gas turbine engine. (15 marks)
- 13 (a) Explain how the rate of aircraft climb can be initiated in flight. (2 marks)
- (b) Explain four factors that can cause an aircraft to stall in flight. (8 marks)
- (c) Outline five design features of an aerofoil. (5 marks)
- 14 (a) Outline four maintenance tasks to be carried out on lead acid batteries. (4 marks)
- (b) Give five reasons why alternating current is preferred to direct current in aircraft electrical systems. (5 marks)
- (c) Differentiate between the following aircraft electrical devices:
- (i) investor and rectifier;
- (ii) fuse and circuit breaker;
- (iii) alternator and generator. (6 marks)
- 15 (a) State two functions of selector valves in aircraft hydro-pneumatic systems. (2 marks)
- (b) Explain the causes of fluid flow transition from laminar to turbulent in aircraft hydraulic system pipes. (3 marks)
- (c) With the aid of labelled sketches, explain the principle of operation of each of the following aircraft system components:
- (i) one-way adjustable restrictor;
- (ii) basic pressure control valve. (10 marks)