

1.(a) Calculate the following :-

- (i) The piston area required to produce a force of 1000 pounds if a pressure of 6500 psi is used.
- (ii) The pressure needed to produce a force of 3,000 pounds if the piston has an area of 5 sq inches..
- (iii) Volume of fluid needed to move a piston having an area of 8 sq inches at a distance of 15 inches

**.(12 marks)**

(b) Outline any EIGHT applications of hydraulic system in an aircraft.

**(8marks)**

2. (a) With aid of a labelled sketch, explain the operation of an aircraft full pneumatic system.

**(10 marks)**

(b) Outline the following :-

(i) FIVE safety precautions observed during pneumatic system maintenance.

(ii) FIVE advantages of using pneumatic system.

**(10marks)**

3. (a) Describe the construction of an aircraft landing gear

**(10marks)**

(b) Discuss the operation of an aircraft landing gear oleo-pneumatic shock strut.

**(10 marks)**

4. (a) Highlight the function of an aircraft brake system.

**(5marks)**

(b) Discuss the operation of an aircraft brake system.

**(7marks)**

(c) Describe the following aircraft brake system components.

(i) Master cylinder

(ii) Stator plates

(iii) Rotor plates

(iv) Brake pads

(8marks)

5. (a) Outline FOUR types of aircraft steering systems.

(4marks)

(b) State FOUR advantages of using nose wheel steering.

(4marks)

(c) Explain the operation of an aircraft nose wheel steering.

(12marks)

6. (a) Outline FIVE functions of air-conditioning system.

**(10marks)**

(b) State the following in air-conditioning :

(i) FIVE sources of air supply

(ii) FIVE sections of a typical air-conditioning system.

**(10marks)**

7. With aid of labelled sketches explain the operation of the following air-conditioning systems :

(i) Air-cycle

(ii) Vapour cycle

**(12marks)**

8 Explain the maintenance procedures carried out on the following air-conditioning components :

(i) Heat exchangers

(ii) Cold air unit

**(20marks)**