Hall Ticket No | | | | | | | | | | | Question Paper Code: BCC004

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

M.Tech II Semester End Examinations (Regular) - July, 2017

Regulation: IARE–R16

DESIGN OF HYDRAULIC AND PNEUMATIC SYSTEMS (CAD/CAM)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Explain any SEVEN advantages of fluid power systems. **[7M]**
   (b) What is the basic law that is important in applying fluid power and what is its significance? **[7M]**

(OR)

2. (a) What are the basic systems of Hydraulic, Explain them in detail? **[7M]**
   (b) Explain different types of fluid used in hydraulic system. **[7M]**

UNIT – II

3. (a) Explain in brief about the working of external gear pump with the neat sketch? **[7M]**
   (b) The bent axis piston pump has following data: **[7M]**
   Speed, N = 1000rpm; Number of piston, n = 9; Piston diameter, d_p = 15mm; Diameter of piston circle, D = 125 mm; Offset angle, $\theta = 10°$; Volumetric efficiency, $\eta_v = 94\%$.
   Determine the actual flow rate.

(OR)

4. (a) With a neat explain the different parts of a double acting cylinder. **[7M]**
   (b) With a neat sketch, explain different mounting arrangement in cylinder. **[7M]**

UNIT – III

5. (a) Discuss the factors to be considered during the selection of a hydraulic pump. **[7M]**
   (b) Design a pilot operated pressure relief valve and discuss the advantages of this valve over a direct pressure relief valve. **[7M]**

(OR)

6. (a) Discuss about the different types of elements of the power pack, Explain any two elements in detail. **[7M]**
   (b) Describe about the safety systems adopted in hydraulics. **[7M]**

UNIT – IV

7. (a) What are accumulators? Explain the working of a spring loaded accumulator. **[7M]**

   (b) Draw a circuit using step counter method for the following sequence A+B+B-A-, where A and B stands for cylinders, (+) indicates extension and (–) indicates retraction of cylinders. **[7M]**

(OR)

8. (a) Design a hydraulic circuit with a 3/4 way direction control valve, regenerative centered DCV, solenoid actuated valve with neat sketches. **[7M]**

   (b) Design a hydraulic circuit with a needle valve integrated with a check valve. **[7M]**

UNIT – V

9. (a) Describe with a block diagram of a pneumatic system using Program logic Control. **[7M]**

   (b) Discuss in detail about the advantages of the Program logic Control over the other systems. **[7M]**

(OR)

10. (a) Discuss the importance of oil and filter changes in hydraulic system. **[7M]**

    (b) Enlist important problems and remedial measures in a pneumatic system. **[7M]**

– ○ ○ ◯ ○ ○ –