CBCS SCHEME

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15ME72

Seventh Semester B.E. Degree Examination, June/July 2019
Fluid Power Systems

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Sketch and explain the structure of hydraulic control system. **(10 Marks)**

b. State Pascal's law? Explain the significance of Pascal's law in applying fluid power. **(06 Marks)**

OR

2 a. What is the importance of seals in hydraulic system? list the functions of seals? **(08 Marks)**

b. What are the desirable properties of fluids in hydraulic system? **(08 Marks)**

Module-2

3 a. What are the important considerations taken while selecting a pump for particular applications? Explain procedure. **(06 Marks)**

b. A pump having displacement of $14cm^3$ is driven at 1440rpm and operates against a maximum pressure of 150bar. The volumetric efficiency is 0.9 and the overall efficiency is 0.80. Find :

i) Pump delivery in LPM
ii) The input power required in kW
iii) The Torque at the pump shat **(10 Marks)**

OR

4 a. What is an actuator? How are they classified? Explain each one of them briefly. **(08 Marks)**

b. A double acting cylinder with a single rod (differential cylinder) has to produce a thrust and 100kN at a speed of 0.4 cms/sec during extension. The operating pressure is 120 bar. Calculate the diameter of the cylinder and flow rate. If the cylinder has a piston rod of 20mm diameters. What would be the force and speed during retraction for the same operating pressure and discharge? **(08 Marks)**

Module-3

5 a. Explain briefly he construction, working principle along with graphic symbol of the following: i) Sequencing valve ii) Counter balance valve. **(10 Marks)**

b. Explain with a neat sketch, the principle of working of a pilot operated pressure relief valve. Also draw the graphic symbol for the valve. **(06 Marks)**

OR

6 a. Explain briefly with a neat sketch, the cylinder synchronizing circuit operated together with a pair of cylinders in series in a synchronized manner to lift the load? **(08 Marks)**

b. Describe i) Meter – in circuit ii) Meter out circuit for controlling the speed of cylinder? List their merits and limitations? **(08 Marks)**

Module-4

7 a. List the advantages and limitations of Pneumatic system. **(08 Marks)**
b. Explain with a neat sketch 3/2 way spool type dc valve to control flow of air in pneumatic system. **(08 Marks)**

OR

8 a. Differentiate between hydraulic and pneumatic system. **(06 Marks)**
b. Explain the following with a neat sketches.
i) Magnetic type rodless cylinder
ii) Cable operated rodless cylinder. **(10 Marks)**

Module-5

9 a. Using two-way, two-position DCV, show how the following logic-functions can be achieved in pneumatics? i) AND ii) OR **(08 Marks)**
b. Explain direct and indirect actuation of pneumatic cylinder. **(08 Marks)**

OR

10 a. Explain the principle of cascade control system. **(08 Marks)**
b. What are Sensors? How many types of sensons are used in electro-pneumatic systems? **(08 Marks)**

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