CBCS SCHEME

USN | | | | | | | | | |

18ME55

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Fluid Power Engineering

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. State Pascal's law. Explain with a sketch its application to simple hydraulic jack. **(10 Marks)**

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

OR

2 a. With the aid of neat sketches explain the following :
i) Suction line filtering
ii) Pressure line filtering
iii) Returns line filtering. **(10 Marks)**

b. Explain briefly the desirable properties of hydraulic fluid. **(10 Marks)**

Module-2

3 a. Sketch and explain the construction and working of 'External Gear Pump' giving expressions for volumetric displacement and theoretical flow rate. **(10 Marks)**

b. A vane pump has volumetric displacement of 82cm^3. The diameter of rotor is 50mm and that of cam ring is 75mm. If the width of the vane rotor is 40mm. Find eccentricity, maximum eccentricity and maximum volumetric displacement possible. **(10 Marks)**

OR

4 a. Explain with a neat sketch of working of linear actuator with cushioning. **(10 Marks)**

b. An 8cm diameter hydraulic cylinder has 4cm diameter rod. If the cylinder receives flow at 100 ℓpm and 12 MPa. Find :
i) Maximum extension and retraction forces
ii) Maximum extension and retraction velocities. **(10 Marks)**

Module-3

5 a. Explain the internal construction and working of 4/2 spool valve. Draw its symbolic representation. **(10 Marks)**

b. With a neat sketch, explain pilot operated check valve. **(10 Marks)**

OR

6 a. Explain the meter-in method of speed control of hydraulic cylinder with neat circuit diagram. **(10 Marks)**

b. With a neat circuit diagram explain regenerative circuit used in drilling machine application. **(10 Marks)**

Module-4

7 a. Sketch and explain the structure of pneumatic control system. **(10 Marks)**

b. List the advantages and limitations of pneumatic power systems. **(10 Marks)**

OR

8 a. What is FRL unit in pneumatic system? Explain its function with symbolic representation. **(10 Marks)**

b. Explain with a pneumatic circuit how quick exhaust valve can be used to increase the actuation speed of a cylinder. **(10 Marks)**

Module-5

9 a. Explain direct control of double acting cylinder using 5 ports/2 position DC valve. **(10 Marks)**

b. Explain 'supply air throttling' and 'exhaust air throttling' used in speed control of cylinders. **(10 Marks)**

OR

10 a. Explain a typical pneumatic circuit based on 'AND' logic function using two pressure valve. **(10 Marks)**

b. Explain the working of a solenoid controlled pilot operated DCV. **(10 Marks)**

* * * * *