CBCS SCHEME

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17MT53

Fifth Semester B.E. Degree Examination, July/August 2021
Hydraulics and Pneumatics

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions.

1 a. What are advantages and limitations of a hydraulic system? **(06 Marks)**
b. Explain a hydraulic system with suitable diagram. **(08 Marks)**
c. Define Pascal's law. Explain mechanical advantage using Pascal's law. **(06 Marks)**

2 a. List different types of positive displacement pump used in hydraulic systems. Explain any one type. **(10 Marks)**
b. A gear pump has a 75mm outside diameter, a 50mm inside diameter and a 25mm width. If the volumetric efficiency is 90% at rated pressure, what is the corresponding flow rate? The pump speed is 1000rpm. **(10 Marks)**

3 a. With neat figure describe constructional details of a gear motor at a rotory actuator. **(06 Marks)**
b. List and explain hydraulic motor performance parameters. **(06 Marks)**
c. A hydraulic motor has an $82cm^3$ (0.082L) volumetric displacements. If it has a pressure rating of 70 bars and it receives oil from a $0.0006m^3/s$ (0.6L/S) pump, find the motor speed, torque capacity and power capacity. **(08 Marks)**

4 a. Explain various classifications of directional control values. **(10 Marks)**
b. Explain application of 3/2 and 4/2 directional control value to double acting cylinder. **(10 Marks)**

5 a. Explain regenerative cylinder circuit. **(10 Marks)**
b. Describe hydraulic cylinder synchronizing circuits. **(10 Marks)**

6 a. Explain one desirable properties of hydraulic fluid. **(10 Marks)**
b. Write a note on sealing devices used in hydraulic power system. **(10 Marks)**

7 a. Explain basic components of pneumatic system. **(06 Marks)**
b. Write advantages and disadvantages of pneumatic system. **(06 Marks)**
c. List types of pneumatic actuators. Explain any one type. **(08 Marks)**

8 a. Describe:
i) Ball seat poppet directional control value
ii) Hand operated 3/2 spool directional control value. **(14 Marks)**
b. Explain pressure limiting value. **(06 Marks)**

9 a. Explain with suitable figure, use of logic gates AND and OR in pneumatic application. **(12 Marks)**
b. Explain fluidic frequencies control of two pneumatic cylinder. **(08 Marks)**

10 a. Explain solenoid control of directional values. **(10 Marks)**
b. Describe control of single cylinder using electro pneumatics. **(10 Marks)**

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