16

CBCS SCHEME

USN | | | | | | | | | | 15MA72

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020
Hydraulic Circuits and Program Logic Controllers

Time: 3 hrs. Max. Marks: 80

Note: 1. ***Answer any FIVE full questions, choosing ONE full question from each module.***
2. ***Draw neat sketch wherever required.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Enumerate the advantages and applications of fluid power Systems. **(08 Marks)**
b. State and explain the Pascal's law. Explain any one applications of Pascal's law. **(08 Marks)**

OR

2 a. Enumerate the different types and properties of fluids for hydraulic system. **(06 Marks)**
b. Explain the following :
i) Seals
ii) Pipes and hoses
iii) Sources of contamination and its control. **(10 Marks)**

Module-2

3 a. With a neat sketch, explain the constructional features of a balanced vane pump. **(08 Marks)**
b. Enumerate different types of Accumulators. Explain with a circuit diagram, how an accumulator is used as emergency power source. **(08 Marks)**

OR

4 a. With a neat sketch, explain the Bent axis type Piston motor. **(08 Marks)**
b. A hydraulic motor operating at 75 bar pressure has a volumetric displacement of 175cm^3/rev. The motor runs at 2000 rpm to deliver a torque of 175 N-m, while using a flow rate of 375ℓpm. Determine the volumetric, mechanical and overall efficiencies. Also determine the actual power delivered by motor. **(08 Marks)**

Module-3

5 a. With a neat schematic diagram, explain 4/2 spool valve. **(06 Marks)**
b. Explain the simple pressure relief valve with a neat sketch. **(06 Marks)**
c. Write the symbols of the following valves.
i) 3-Poistion – 4 ways spring centered solenoid operated Direction control valve
ii) Pressure compensated Flow control valve. **(04 Marks)**

OR

6 a. With a neat circuit, explain how a regenerative circuit increase the cylinder extending speed. **(08 Marks)**
b. Explain how the two cylinders series are synchronized with a neat circuit diagram. **(08 Marks)**

Module-4

7 a. With a schematic diagram, explain the structure of a pneumatic power system. **(08 Marks)**
b. Explain the following FRL units
i) Air filters
ii) Lubricators **(08 Marks)**

OR

8 a. Explain how end position cushioning is achieved in air cylinder with a schematic diagram. **(06 Marks)**

b. Explain the following pneumatic control vales
   i) Poppet valve
   ii) Quick exhaust valve **(10 Marks)**

Module-5

9 a. Four hazard inputs to the alarm system that go on as some operational malfunction occurs. Write the four inputs, draw the PLC logic ladder diagram. Assign input and output. Also write the PLC connection. **(12 Marks)**

b. Write a note on PLC input and output modules. **(04 Marks)**

OR

10 a. With a schematic diagram, explain the architecture of PLC. **(10 Marks)**

b. Enumerate the features of PLC. **(06 Marks)**

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