CBCS SCHEME

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15AU554

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Hydraulics and Pneumatics

Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. State Pascal's law. Explain with neat sketch, the basic hydraulic power system. **(04 Marks)**

b. Explain the construction and working of balanced vane pump. **(06 Marks)**

c. A hydraulic pump has a displacement volume of 120 cm^3. Its actual flow rate is 0.0015 m^3/s at 900 rpm and 75 bars. If the actual torque input by the prime mover to the pump is 150 N-m, determine the overall efficiency of the pump. Also, find the theoretical torque input to the pump for its operation. **(06 Marks)**

OR

2 a. Explain with a neat sketch, construction and operation of a double-acting hydraulic cylinder. **(08 Marks)**

b. Explain with neat sketch:
i) Swash-plate piston motor
ii) First-class lever system **(08 Marks)**

Module-2

3 a. Explain briefly with neat sketch working of pressure compensated flow control valve. **(07 Marks)**

b. Explain the working principle of pilot-operated check valve with neat sketch. Illustrate the graphical symbol of the valve. **(09 Marks)**

OR

4 a. Explain briefly filters and strainers in hydraulic system. **(08 Marks)**

b. Explain the following:
(i) Types of hydraulic fluids
(ii) Wear of moving parts due to solid particle contamination **(08 Marks)**

Module-3

5 a. Explain with a neat circuit diagram the working of a regenerative circuit. **(07 Marks)**

b. With a neat sketch, explain hydraulic circuit for sequencing of two cylinders. **(09 Marks)**

OR

6 a. Explain the following with neat sketch:
(i) Cylinder synchronization in parallel
(ii) Emergency power source accumulator circuit **(10 Marks)**

b. Distinguish between meter-in and meter-out flow control. **(06 Marks)**

Module-4

7 a. Sketch and explain end-Position cushioning in air cylinder. **(08 Marks)**

b. Explain with neat sketch, the different types of seals used in air cylinder. **(08 Marks)**

OR

8 a. Classify pneumatic valves and explain with a neat sketch suspended seat type slide valve. **(09 Marks)**

b. Explain with a neat sketch, construction and operation of a typical quick exhaust valve to increase the actuation speed of a cylinder in a pneumatic system. **(07 Marks)**

Module-5

9 a. Explain with a neat diagram coordinated motion control of two cylinders. **(10 Marks)**

b. Explain the steps involved in cascade circuit design. **(06 Marks)**

OR

10 a. Explain with neat sketch solenoid controlled pilot-operated directional control valve. **(06 Marks)**

b. Explain the following with neat sketch:
(i) Refrigerated dryer
(ii) Lubricators **(10 Marks)**

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