CBCS SCHEME

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15MR752

Seventh 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. What are the advantages and disadvantages of hydraulic system? Also write the application of hydraulic system. **(06 Marks)**

b. Write the structure of hydraulic control system. **(06 Marks)**

c. In a hydraulic jack arrangement, calculate the output force for the following data. Input diameter 25mm, output diameter 100mm, input force 15kN, calculate how much input Piston must be moved to move the output Piston 100mm. Also calculate velocity of input Piston if the output velocity of Piston is 0.05m/s. **(04 Marks)**

OR

2 a. Write the graphical symbol of pumps. **(04 Marks)**

b. Define the following:
i) Volumetric efficiency
ii) Mechanical efficiency
iii) Overall efficiency. **(04 Marks)**

c. With a neat sketch, explain construction and working of Gear pump. **(08 Marks)**

Module-2

3 a. With a neat sketch, explain the construction and working of Double acting cylinder with Piston rod on both sides. **(08 Marks)**

b. A cylinder with a bore of 150mm and a Piston rod diameter of 105mm, has to extend with a speed of 7m/s, pressure applied is 150bar. Calculate:
i) Flow rate of oil to extend in *l*pm
ii) Flow rate from annulus side on extend in *l*pm
iii) Retract speed in m/min using flow rate
iv) Flow rate from full bore end on retract. **(08 Marks)**

OR

4 a. With a neat sketch, explain the construction and working of Vane motor. **(08 Marks)**

b. Write the graphical symbol for hydraulic motor. **(04 Marks)**

c. A motor must produce a torque of 350Nm in a system with an operating pressure of 25000 kPa. What size motor should we select? Assume 100% efficiency. **(04 Marks)**

Module-3

5 a. Write the basic valve symbols. **(04 Marks)**

b. With the circuit diagram, write how to control of the single acting hydraulic cylinder. **(06 Marks)**

c. Write meter-in and meter-out flow control valve systems. **(06 Marks)**

OR

6 a. Write the desirable properties of hydraulic fluids. (08 Marks)
b. Write a note on Filters and strainers. (08 Marks)

Module-4

7 a. Write the important components of pneumatic system. (04 Marks)
b. Write a note on Seals. (04 Marks)
c. With a neat sketch explain the construction of a typical pneumatic cylinder. (08 Marks)

OR

8 a. With a neat sketch, explain 3/2 poppet valve. (08 Marks)
b. Write the circuit diagram for Quick exhaust valve for flow to the cylinder. (08 Marks)

Module-5

9 a. Write the circuit diagram for signal suppression and signal elimination. (08 Marks)
b. Write the air relay diagram. (08 Marks)

OR

10 a. Write the method of preparation of compressed air. (08 Marks)
b. Write a note on:
i) Air dryers
ii) Filters. (08 Marks)

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