15AU554

Fifth Semester B.E. Degree Examination, Aug./Sept. 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.   In a high pressure hydraulic cylinder, a force of 5000N is applied on to the piston. The diameter of the piston is 150mm. What is the pressure on the fluid in the cylinder?
                                                                                        (04 Marks)
    b.   With a neat sketch, explain pressure compensated vane pump.   **(08 Marks)**
    c.   The rotor and cam ring diameter in a vane pump are 8cm and 12cm respectively. If the vane width is 5cm and the eccentricity is 1.2cm, determine the volumetric efficiency.   **(04 Marks)**

OR

2   a.   Write the advantages of Hydraulic motors.   **(04 Marks)**
    b.   With a neat sketch, explain external gear motor.   **(06 Marks)**
    c.   A hydraulic motor operating at 75 bar pressure has a volumetric displacement of $175 \times 10^3 mm^3$/rev. The motor runs at 2000rpm to deliver a torque of 175 N-m, while using a flow rate of 375 ℓpm. Determine volumetric efficiencies mechanical efficiency and overall efficiency.   **(06 Marks)**

Module-2

3   a.   With a neat sketch, explain pilot – operated check valve.   **(06 Marks)**
    b.   With a neat sketch, explain pressure reducing valve.   **(06 Marks)**
    c.   Briefly, explain needle valve.   **(04 Marks)**

OR

4   a.   Explain with a simple neat sketch the working of a full flow filter.   **(06 Marks)**
    b.   With a neat sketch, explain air cooled Heat exchanger.   **(06 Marks)**
    c.   Write a note on seal material.   **(04 Marks)**

Module-3

5   a.   Explain with a neat circuit diagram the working of a double pump hydraulic system.
                                                                                        (08 Marks)
    b.   With a neat circuit diagram, explain the working of a locking cylinder using pilot operated check valve.   **(08 Marks)**

OR

6   a.   Explain with a neat circuit diagram the working of a meter in for controlling the speed of a cylinder.   **(08 Marks)**
    b.   Explain with a simple sketch the working of a bladder type accumulator.   **(08 Marks)**

Module-4

7 a. With a neat sketch, explain the working of a cushioned cylinder. (08 Marks)
   b. What are the advantages of rodless cylinder? (04 Marks)
   c. Write the advantages of Air motor. (04 Marks)

OR

8 a. Sketch and explain Quick exhaust valve. (08 Marks)
   b. With neat circuit diagram. Explain.
      i)   Supply air Throttling
      ii) Exhaust air throttling. (08 Marks)

Module-5

9 a. Explain the motion – step diagram for a two cylinder circuit. (08 Marks)
   b. With a neat sketch, explain the solenoid operated DCV. (08 Marks)

OR

10 a. Sketch and explain the working of an air lubricator. (08 Marks)
   b. Sketch and explain the working of electrical Relay (08 Marks)

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