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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. Define fluid power. List its advantages and disadvantages. (10 Marks)
 - b. Explain the basic components of a hydraulic power system with a neat sketch. (10 Marks)
- 2
 - a. Explain the construction and working of an unbalanced vane pump with a neat diagram. (10 Marks)
 - b. An external gear pump has 125mm outside diameter, 85mm inside diameter and 40mm width for a pump speed of 1500rpm. Determine the theoretical volumetric displacement and theoretical flow rate. If the volumetric efficiency is 90%, what is the actual flow rate? (10 Marks)
- 3
 - a. Explain any two of the mechanics of hydraulic cylinder loading with a neat sketch. (10 Marks)
 - b. In a hydraulic operation, the cylinder is required to extend against a load of 60kN and retract against a load of 6kN. If the cylinder bore diameter and rod diameter are 60mm and 20mm respectively, determine pressure for each stroke. (10 Marks)
- 4
 - a. Explain with neat sketch, the working of any two types of check valves or directional valves. (10 Marks)
 - b. Explain the construction and operation of a simple needle valve. (10 Marks)
- 5
 - a. With neat sketch, explain the operation of cylinder sequencing circuit. (10 Marks)
 - b. Explain with neat sketch the operation of automatic cylinder reciprocating circuit. (10 Marks)
- 6
 - a. Explain what are the different additives used in hydraulic fluids. (10 Marks)
 - b. Explain the constructional features and function of a reservoir system. (10 Marks)
- 7
 - a. Explain with neat sketch Pneumatic power system and also write the advantages of compressed air. (10 Marks)
 - b. With neat sketch, explain Rod-less cylinders and also write its advantages. (10 Marks)
- 8
 - a. With neat sketch explain the operation of pressure regulator. (10 Marks)
 - b. Explain with neat sketch the operation of direct and indirect actuation of cylinder. (10 Marks)
- 9
 - a. With neat sketch, explain the operation of time dependent control circuit. (10 Marks)
 - b. Explain the working of coordinated motion control with control diagrams. (10 Marks)
- 10
 - a. Explain the working of sequential motion control-signal elimination with motion control diagram. (10 Marks)
 - b. Explain any two contactors or switches used in electro-pneumatic control system. (10 Marks)