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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. State Pascal law and explain structure of a hydraulic control system with sketch. (10 Marks)
 - b. Explain the construction and working principle of balanced vane pump with neat sketch. (10 Marks)

- 2
 - a. Explain the construction and working of swash plate piston motor. (08 Marks)
 - b. With a neat sketch, derive an expression for second-class lever system with hydraulic cylinder to drive a load. (07 Marks)
 - c. A gear pump has a 75mm outer diameter 50mm internal diameter and 25mm width. If the volumetric efficiency is 90% at rated pressure, find the corresponding actual flow rate in litres/min, given pump speed is 1000rpm. (05 Marks)

- 3
 - a. Explain with a neat sketch construction and working of 4/3 spool type direction control valve. (10 Marks)
 - b. Explain construction and working of simple pressure relief valve. (07 Marks)
 - c. Write graphical symbol for double solenoid actuated spring centered 4/3 valve. (03 Marks)

- 4
 - a. With neat sketches explain Full flow filter and proportional flow filter in fluid flow system. (10 Marks)
 - b. Mention the types of hydraulic fluids. Explain any two hydraulic fluids. (06 Marks)
 - c. Explain static seals and dynamic seals with examples. (04 Marks)

- 5
 - a. Explain with a neat circuit diagram the working of double pump hydraulic system used in punch press applications. (10 Marks)
 - b. Explain spring loaded accumulator with a neat sketch. (04 Marks)
 - c. Explain construction and working of double acting cylinder. (06 Marks)

- 6
 - a. What is regenerative circuit? Sketch schematically regenerative circuit to increase the extension speed of a double acting cylinder. (10 Marks)
 - b. Explain with a neat circuit diagram of counter balance valve circuit. (10 Marks)

- 7
 - a. Explain end position cushioning in air cylinder with a neat sketch. (10 Marks)
 - b. Sketch and explain structure of pneumatic control system. (10 Marks)

- 8
 - a. Explain the working of poppet valve with a neat sketch. (10 Marks)
 - b. Explain direct and indirect control of pneumatic cylinders. (10 Marks)

- 9
 - a. Explain cascade method of pneumatic circuit design. (12 Marks)
 - b. Explain coordinated motion control with circuit diagram. (08 Marks)

- 10
 - a. With a circuit diagram, explain pilot assisted solenoid control of DC valve. (08 Marks)
 - b. Explain the limit switches and Relay with neat sketches. (12 Marks)

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.