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06ME82

Eighth Semester B.E. Degree Examination, June/July 2011
Hydraulics and Pneumatics

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer FIVE full questions selecting at least TWO questions from each part.
2. Draw neat sketches wherever necessary.

PART – A

- 1 a. Sketch and explain the working of a balanced vane pump. (08 Marks)
b. List six basic components required in a hydraulic power system and state the essential functions of each. (06 Marks)
c. A vane pump has a volumetric displacement of 90cm^3 . It has rotor dia of 5.0 cm. and cam ring dia of 7.5cm and a vane width of 5.0 cms. What must be the eccentricity? (06 Marks)
- 2 a. With a neat sketch, explain the operation of swash plate put on motor in hydraulic system. (06 Marks)
b. Describe 'end cushion' provided in air cylinder with a neat sketch. (06 Marks)
c. A hydraulic motor has a displacement volume of 130 cm^3 per revolution and operates with a pressure of 105 bar and a speed of 2000 rpm, actual flow rate consumed by rotor is 5.00 LPS and actual flow torque delivered by motor is 200 N-m, find : i) Volumetric efficiency ; ii) Mechanical efficiency ; iii) Overall efficiency. (08 Marks)
- 3 a. Explain with a neat sketch, the principle of working of a pilot operated pressure relief valve. Draw graphic symbol for the valve. (10 Marks)
b. Describe the working principle along with graphic symbol of the following :
i) Sequence valve ; ii) Counter balance valve. (10 Marks)
- 4 a. Explain with a neat circuit diagram, the working of a meter out circuit for controlling the speed of a cylinder. State its advantages and disadvantages. (10 Marks)
b. Describe with a neat diagram, the construction and working of a spring loaded accumulator – state its disadvantages. (10 Marks)

PART – B

- 5 a. How are hydraulic seals classified? What is meant by positive and non positive seal? (06 Marks)
b. What are the effects of solid contaminant? Explain with a simple sketch influence of contaminant on lubricating fluid. (06 Marks)
c. Name three types of fluid generally accepted by fluid power system. Why water is not suitable media in fluid power system? What are the prime functions of fluid? (08 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.

- 6** a. Define pneumatic actuator. How are they classified? (04 Marks)
b. What is meant by double acting cylinder? Explain with a neat diagram, the constructional feature and working principle of double acting cylinder. (08 Marks)
c. What is meant by rotary actuator? Name its basic forms? Explain them with neat diagram. (08 Marks)
- 7** a. Define control diagrams. Name the recommended procedure for drawing control diagram. (04 Marks)
b. What do you mean by quick exhaust valve? Explain its working principle, with a neat sketch. (08 Marks)
c. Explain with a pneumatic circuit, the control of extension of double acting cylinder using OR and AND logic gates. (08 Marks)
- 8** Write short notes on :
a. Accumulator as emergency power source.
b. Electro – pneumatic control.
c. Hydraulic cylinder sequencing circuit diagram.
d. Radial pump. (20 Marks)

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