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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Industrial and Production Engineering

Semester End Examination; June - 2017

Hydraulics and Pneumatics Systems

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a. Explain with a block diagram, the various components of a hydraulic system. 10

b. With the help of a neat sketch, explain pressure compensated vane pump. 10

2 a. Show that the cylinder force required to overcome the load force is least in second class lever system when compared to first and third lever system. 6

b. Explain with a neat sketch, the operation of cylinder cushion. 10

c. Explain with a hydraulic circuit, closed circuit hydraulic transmission. 4

UNIT - II

3 a. It is required to reciprocate a single acting cylinder. Design a suitable valve to reciprocate it and explain it with a neat sketch. 8

b. Explain with a neat sketch, a pilot operated check valve. 8

c. Mention the differences between closed centre and tandem centre 4/3 DCV's. 4

4 a. Explain with the help of a neat sketch, a pressure relief valve. 10

b. With the help of a neat sketch, explain reducing type of pressure compensated flow control valve. 10

UNIT - III

5 a. A hydraulic cylinder has the following motion in the cycle. Fast approach followed by flow control mention and Fast return. Design a hydraulic circuit to achieve the above motion for the cylinder and justify the components selected in the system. 10

b. A vertical load needs to be lowered slowly and it is lifted up with a flow controlled motion. Design a hydraulic circuit to balance the load during its motion in vertical direction and explain the components used in the system. 10

6 a. Design a hydraulic system to reciprocate 2 cylinders to move in the following sequence, A+B+B-A-. Use pressure sequence method to design the system. 10

b. Mention the differences between Meter-in and Meter-out type of speed control with hydro circuit. 6

c. Design a hydraulic system using an Accumulator to be used as an emergency power source. 4

Contd…2

UNIT - IV

7 a.	Explain the four types of fluids used in fluid power system.	6
b.	Explain with circuit diagram, the various locations of filters used in hydraulic circuits.	6
c.	Explain : i) O-rings ii) Compression packing used in hydraulic system with sketches.	8
8 a.	What are the main reasons for hydraulic system break down? Explain how solid particle contaminations wear the moving parts?	6
b.	Explain the problem caused by gases in hydraulic fluids.	6
c.	Explain how temperature is controlled in a hydraulic system?	8

UNIT - V

9 a.	Explain with the help of a block diagram, the structure of pneumatic system.	10
b.	Explain the procedure of preparation of compressed air to be used for the penumatic system.	10
10 a.	With the help of a neat sketch, explain two stage compressors.	10
b.	Explain air dryness with neat sketch.	10

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