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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; Aug. / Sep. - 2020 Hydraulic and Pneumatic Systems

Max. Marks: 100 Time: 3 hrs

Note: i) Answer TWO full questions, selecting ONE full question from UNIT - I and UNIT - II. ii) Answer any THREE full questions, choosing from UNIT - III, UNIT - IV and UNIT - V.

UNIT - I

1 a.	State Pascal's law.	Explain	with block	diagram,	the six	basic	components to	build a	1
	hydraulic system.								

b. How are the hydraulic pumps classified? Describe the working of piston pump.

With a neat sketch, explain the mechanics of hydraulic cylinder loadings.

b. A hydraulic transmission operating at 100 bar pressure has the following characteristics:

	Pumps	Motor
Volumetric discharge	100 cm ³	
Volumetric efficiency	90%	92%
Mechanical efficiency	85%	87%
Speed	1500 rpm	700 rpm

Determine; i) Displacement of motor

ii) Output torque of the motor

Write ISO symbols for; i) Single acting cylinder and ii) Double acting cylinder.

UNIT - II

- Write ISO hydraulic symbol, for 4/3 directional control valve used in hydraulic circuit.
 - With a sketch, explain construction and operation of 2/2 and 3/2 DCV.

- With a neat sketch, explain the significance of pressure reducing valve.
 - b. Explain the working of a pressure compensated flow control valve.

UNIT - III

- 5. Design and explain the hydraulic circuit for the following:
 - i) Unloading the pump

- ii) Counter balance valve application
- 6 a. Differentiate meter-in and meter-out type of speed control with hydraulic circuit controlling the speed of forward motion of cylinder.

b. With the help of hydraulic circuit, explain the application of accumulator in an emergency power source.

UNIT - IV

7 a.	Explain with examples, desirable properties of hydraulic fluids.	10				
b.	Explain various problems caused by gases in hydraulic fluids.	10				
8 a.	Explain the three types of most widely used seal configuration.	10				
b.	Write a short notes on:					
	i) Temperature control	10				
	ii) Trouble shooting					
UNIT - V						
9 a.	Explain with a block diagram, the structure of a pneumatic system.	10				
b.	Explain clearly the production of compressed air.	10				
10 a.	Explain with a neat sketch, the working of vane motor in pnenumatic system.	10				
b .	Write a short notes on Screw-Type compressor.	10				

Mindella M. A. 2020
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