

CBCS Scheme

15ME72

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Seventh Semester B.E. Degree Examination, December 2018/January 2019

Fluid Power systems (Model QP)

Time: 3 hrs

Max marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module

<u>Module-1</u>		
1	a.	Explain with a neat sketch the working of a hydraulic jack using Pascal's law. (08 Marks)
	b.	State and explain the advantages and limitations of hydraulic system. (08 Marks)
OR		
2	a.	With the aid of neat sketches explain the following. 1) Suction line filtering 2) pressure line filtering 3) Return line filtering. (09 Marks)
	b.	Explain briefly the desirable properties of hydraulic fluids. (07 Marks)
<u>Module-2</u>		
3	a.	Explain with a neat sketch the working principle of swash plate axial piston pump. (08 Marks)
	b.	A hydraulic pump has a displacement volume of 100cm ³ . Its actual flow rate is 0.0015m ³ /s at 1000rpm and 70 bars. If the actual torque input by the prime mover to the pump is 120N-m, determine the overall efficiency of the pump. Also, find the theoretical torque input to the pump for its operation. (8 Marks)
OR		
4	a.	Explain with a neat sketch the working of linear actuators. (08 Marks)
	b.	An 8 cm diameter hydraulic cylinder has 4cm diameter rod. If the cylinder receives flow at 100lpm and 12MPa, find i) Maximum extension and retraction forces ii) Maximum extension and retraction velocities. (08 Marks)
<u>Module-3</u>		
5	a	Explain with a neat sketch how 3 way & 4 way directional control valves operate. (10 Marks)
	b	Explain briefly with neat sketch the construction and operation of simple pressure relief valve with a neat sketch. (06 Marks)
OR		
6	a	Explain with a neat circuit diagram the working of a regenerative circuit. (08 Marks)
	b	Explain briefly the Meter in and Meter out circuits with neat sketches. (08 Marks)
<u>Module-4</u>		
7	a	Sketch and explain the mechanism of end position cushioning. (06 Marks)
	b	State the advantages and disadvantages of pneumatic systems. (04 Marks)
	c	Explain the different types of seals with a neat sketch. (06 Marks)
OR		

8	a	Explain with a neat sketch the construction and operation of a typical quick exhaust valve to increase the actuation speed of a cylinder in a pneumatic system. (08 Marks)
	b	Explain the working of suspended seat type valve with a neat sketch. (08 Marks)
Module-5		
9	a	Explain direct actuation of cylinder and indirect actuation of pneumatic cylinder with neat sketches. (08 Marks)
	b	Explain a typical pneumatic circuit based on AND logic function using a two-pressure valve. (08 Marks)
OR		
10	a	Explain the cascading control action for a two cylinder sequencing circuit. (08marks)
	b	Explain the working of a solenoid-controlled pilot operated DCV. (08marks)

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