

HALL TICKET NUMBER

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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE
(AUTONOMOUS)

IV B.TECH I SEMESTER END REGULAR EXAMINATIONS, NOV-2022
DESIGN OF HYDRAULICS AND PNEUMATICS
(ME Branch)

Time: 3 hours

Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-AAnswer **all** the questions in Part-A (5X2=10M)

Q.No.	Questions	Marks	CO	KL
1.	a) What are the advantages of a hydraulic system?	[2M]	1	1
	b) Write a note on flow control valves	[2M]	2	2
	c) List the drawbacks of simple relief valve	[2M]	3	1
	d) How are the accumulators used in Hydraulics circuits?	[2M]	4	1
	e) What is the principle of solenoid?	[2M]	5	2

PART-BAnswer **One** Question from each UNIT (5X10=50M)

Q.No.	Questions	Marks	CO	KL
UNIT-I				
2.	a) Mention the different types of fluid power systems and list at least two practical applications of each of these systems.	[5M]	1	3
	b) Define Pascal's law. Explain the working of hydraulic jack using this law.	[5M]	1	2
OR				
3.	a) Explain with a neat sketch the working of a single acting cylinder	[5M]	1	1
	b) A hydraulic motor has a 82 cm ³ (0.082L) volumetric displacement. It has a pressure rating of 70 bars and receives oil from a 0.0006m ³ /sec (0.60LPs) theoretical flow rate pump. Find the motor speed and theoretical torque.	[5M]	1	5
UNIT-II				
4.	a) Explain any two types of accumulator circuits with sketch.	[5M]	2	2
	b) Draw a basic block of a circuit showing the reservoir, accessories, pressure relief valve, pump and tank lines.	[5M]	2	2
OR				
5.	a) Explain the actuation of single and double acting cylinder using appropriate direction control valves (DCV).	[5M]	2	3
	b) Explain the working of a direct acting pressure relief valve	[5M]	2	2
UNIT-III				
6.	a) Discuss a regenerative circuit and explain how it helps to get equal extension and retraction forces	[5M]	3	2
	b) Explain with suitable circuits, how the cylinder speed can be controlled by using flow control valves	[5M]	3	3
OR				

7.	a)	Develop an industrial application circuit of a counter balance valve application	[5M]	3	3
	b)	Explain the working of solenoid operated 4/3 spring centered direction control valve for automatic cylinder reciprocating system	[5M]	3	2
UNIT-IV					
8.	a)	What is the function of a time delay valve? Explain the constructional features of a typical time delay valve with a neat sketch.	[5M]	4	2
	b)	With a neat sketch explain how following functions are generated in a pneumatic system i) AND function ii) OR function.	[5M]	4	3
OR					
9.	a)	List and briefly explain the important characteristics of compressed air	[5M]	4	1
	b)	Explain with a schematic diagram the production of compressed air for pneumatic systems	[5M]	4	2
UNIT-V					
10.	a)	Draw a block diagram of Programmable Logic Controller (PLC) showing in very general terms the main units of it.	[5M]	5	3
	b)	Describe the signal flow in control system?	[5M]	5	2
OR					
11.	a)	Evaluated electrically actuated DCV's?	[5M]	5	5
	b)	Draw a block diagram of any one of electrical circuit diagram?	[5M]	5	3
