

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Fourth Semester

Mechanical Engineering

ME3492-Hydraulics and Pneumatics

Regulations - 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	List any four applications of fluid power system in manufacturing industry.	UN	1	2
2.	Why only rotary pumps are preferred for oil hydraulic systems?	UN	1	2
3.	Give the various types of direction control valves.	RE	2	2
4.	Name the different types of special cylinders.	RE	2	2
5.	Identify the function of pressure intensifier.	RE	3	2
6.	What is a combined flow control valve and check valve?	UN	3	2
7.	List the functions of lubricator in pneumatic system.	RE	4	2
8.	Write down the advantage of electro-hydraulic system over hydraulic system.	UN	4	2
9.	Suggest remedies for the problem of leakage of compressed air in pneumatic system.	UN	5	2
10.	If a hydraulic motor does not provide the proper speed and torque, what could be the possible causes for it?	UN	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

Q.No	Questions	BLT	CO	Marks
11.	a Elaborate on any one applications of Pascal's law with a neat sketch.	UN	1	13
	Or			
	b What is the difference between a pump and motor used in hydraulic system? List the different types of pumps and brief the construction and working principle of any two pumps with a neat sketch.	UN	1	13
12.	a Explain the construction and working of hydraulic cushioning system.	RE	2	13
	Or			
	b With a suitable circuit, explain any two construction and working of hydraulic sequence valve.	UN	2	13
13.	a With the help of circuit diagram, explain any two applications of accumulator and also illustrate its types.	UN	3	13
	Or			

	b	Design the circuits for the following applications: (i) Synchronous actuation of two similar hydraulic actuators (ii) Fail-safe operation	RE	3	13
14.	a	Draw a neat sketch of the pneumatic filter and regulator and explain its construction and working process in detail. Or	UN	4	13
	b	Develop a cascade pneumatic circuit for the application of drilling and clamping cylinders.	AP	4	13
15.	a	List the various operating problems associated with pumps and valves and the corresponding possible causes and suitable remedy for each problem. Or	AP	5	13
	b	Draw and design the Pneumatic circuits for Pick and Place applications.	AP	5	13

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	An accumulator is to supply 7370cm ³ of oil with a maximum pressure of 210 bar and minimum pressure of 126 bar gauge to a hydraulic cylinder. If the nitrogen pre-charge pressure is 84 bar gauge, find the size of the accumulator. The hydraulic cylinder piston diameter is 152 mm. Or	AP	3	15
	b	Draw a pneumatic circuit by cascade method for following sequence of operation: A ⁺ B ⁺ B ⁻ A ⁻ where A and B are the two cylinders and + indicates extension and - indicates retraction of the cylinder.	AP	4	15