Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025

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.	State the reason for hydraulic power especially in heavy work.	L1	1	2
2.	Summarize undesirable results when an oil viscosity is too high.	L2	1	2
3.	Draw the graphical symbol for: Solenoid operated, three-way, two position, spring return DCV.	L1	2	2
4.	Discuss the influence of offset angle of swash plate type inline piston pump in the flow rate variations.	L1	2	2
5.	Extend the significance of intensifier in hydraulic system.	L2	3	2
6.	Mention the pressure relief valve requirements in the hydraulic circuit.	L2	3	2
7.	Relate the purpose of the regenerative circuit.	L1	4	2
8.	Outline the importance of the ladder diagram.	L1	4	2
9.	Illustrate the tree-branching chart.	L2	5	2
10.	Define Low-Cost Automation.	L2	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a	i	Explain in details about the application of Pascal's law in the Bramah's Hydraulic Press with neat sketch.	L2	1	10
		ii	Discuss laminar flow and turbulent flow with example.	L2	1	6
			Or			
	b	i	An input cylinder with a diameter of 20 mm is connected to an output cylinder with a diameter of 75 mm. 2000 N force is applied to the input cylinder. Determine the output force? How, far would we need to move the input cylinder to move the output cylinder 80 mm?	L2	1	8
		ii	With respect to pressure, discharge and the provision of variable displacement compare the positive and non-positive displacement pumps.	L2	1	8

12.	a		Demonstrate the importance of the following with neat sketch: i. Solenoid in DCV ii. Cushioning in the cylinder	L2	2	16
			Or			
	b		Draw a simple sketch and graphic symbol of reservoir and discuss the use of various parts of the reservoir. Also outline the role of reservoir in hydraulic circuits.	L2	2	16
13.	a	i	Build an appropriate circuit design that shows how an accumulator can be used as an emergency power source.	L3	3	8
		ii	Develop a circuit example that illustrates how an accumulator may absorb pressure spikes in a hydraulic system to apply the principle of an accumulator as a hydraulic shock absorber.	L3	3	8
			Or			
	b		In an industry, a vertical type double-acting cylinder is used to raise/lower the load. Draw and explain a suitable hydraulic circuit to do the above job without any cylinder creep problem.	L3	3	16
14.	a	i	Utilize the FRL unit by including its purpose along with an example from the manufacturing sector, such as how it keeps clean, lubricated air for pneumatic tools in a factory.	L3	4	8
		ii	Choose a quick exhaust valve and explain how it works in a particular situation, by enabling faster activation of pneumatic cylinders in an automated manufacturing line.	L3	4	8
			Or			
	b		Model and explain a pneumatic circuit for milling operation using the cascade method for the following sequence: A+B+B-A- where A and B Stand for double-acting cylinders. + indicates extension stroke and - indicates retraction stroke of cylinders.	L3	4	16
15.	a		Develop the Meter-in circuit diagram for planning machine operation and explain its working process.	L4	5	16
			Or			
	b		Analyze the necessity and advantages of implementing low-cost automation in a car barrier system with neat sketch.	L4	5	16