

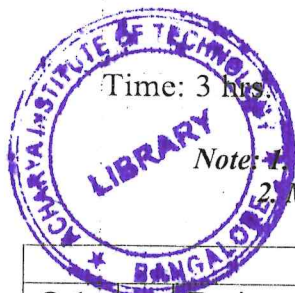
CBCS SCHEME

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BMT403

Fourth Semester B.E./B.Tech. Degree Examination, June/July 2026 Hydraulics and Pneumatics



Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks, L: Bloom's level, C: Course outcomes.

Module – 1				M	L	C
Q.1	a.	Derive a Hydraulic System. Explain the basic structure of a hydraulic control system with a neat diagram.	10	L1	CO1	
	b.	Discuss the advantages, limitations and applications of Pneumatic systems.	10	L2	CO1	
OR						
Q.2	a.	What are the factors to be considered for selecting a hydraulic pump? Explain in brief.	8	L2	CO2	
	b.	Explain the construction and working of a external gear pump.	7	L2	CO2	
	c.	A vane pump is to have volumetric displacement of 82 cm^3 . It has a rotor diameter of 5 cm, a cam ring diameter of 7.5 cm and a vane width of 4.0 cm. What must be the eccentricity?	5	L6	CO2	
Module – 2						
Q.3	a.	Explain with a neat sketch, working of linear actuator single acting cylinder.	5	L2	CO2	
	b.	With a neat sketch, explain second class lever system used with hydraulic cylinders to drive load.	7	L2	CO2	
	c.	A hydraulic motor has a displacement of $165 \text{ cm}^3 / \text{rev}$ and operates with a pressure of 70 bar and a speed of 2000 rpm. If the actual flow rate consumed by the rotor is 6 Lps and the actual torque delivered by the motor is 170 N – m, Find : i) Volumetric Efficiency ii) Mechanical Efficiency iii) Overall Efficiency.	8	L6	CO2	
OR						
Q.4	a.	Explain with a neat sketch, how three way and four way direction control valves operate. Give graphical symbol.	10	L2	CO3	
	b.	Explain Pressure Relief Valve with graphical symbol.	10	L2	CO3	

Module – 3

Q.5	a.	Explain with suitable circuits how single acting and double acting cylinders are controlled.	10	L2	CO3
	b.	Explain briefly the principle involved in a regenerative circuit and obtain an expression for the speed of actuator.	10	L2	CO3

OR

Q.6	a.	What are desirable properties of hydraulic fluids? Explain briefly any five of them.	10	L2	CO3
	b.	Explain briefly Filters and Strainers in hydraulic system.	10	L2	CO3

Module – 4

Q.7	a.	Explain briefly with a neat sketch, 3/2 way spool type direction control valve to control flow of air in pneumatic system.	10	L2	CO4
	b.	Explain with sketch and cushion arrangements in double acting cylinder.	10	L2	CO4

OR

Q.8	a.	Explain with a neat diagram, the construction and working of a Poppet valve.	10	L2	CO4
	b.	What do you mean by Quick Exhaust Valve? Explain its working principle with a sketch.	10	L2	CO4

Module – 5

Q.9	a.	With neat sketch, explain how the following functions are generated in pneumatic systems : i) AND function ii) OR function.	10	L2	CO5
	b.	Explain Cascade Circuit Design.	10	L2	CO5

OR

Q.10	a.	Explain Solenoid Operated DC valve.	10	L2	CO6
	b.	Explain Air – Pilot control of double acting cylinder.	10	L2	CO6

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