

PRN No.

PAPER CODE

U325-2114A (ECE)

(AY:2024-25) May 2025 (ENDSEM) EXAM

TY (SEMESTER - II)

COURSE NAME: Hydraulic and Pneumatics Branch: Mechanical COURSE CODE: MEUA32204R1A
(T.Y 2020R1)

Time: [1Hr 30 Min]

[Max. Marks: 40]

(*) Instructions to candidates:

- 1) Figures to the right indicate full marks. Use of scientific calculator is allowed
- 2) Use suitable data wherever required
- 3) All questions are compulsory. Solve any two-sub question each from Questions 1 and 2
- 4) Solve any one sub question (2 marks) from Questions 3, 4, 5 and 6 and sub question of 4 marks is compulsory from questions 3, 4, 5, and 6

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Describe the following Iso Symbols of 1. Bi-directional hydraulic pump 2. Sequencing valve 3. 3/4 DCV pilot operated.	[4]	1	2
	b) Explain the difference between Pneumatic and Hydraulic System	[4]	1	2
	c) Illustrate the circuit for automatic reciprocating double acting circuit (Only circuit diagram)	[4]	1	2
Q2	a) The load during the forward stroke is 15 kN and that during the return stroke is approx. 9.5 kN. The forward and return speeds are about 3.5 m/min and 5.5 m/min. respectively. Estimate pressure during forward and return stroke (Use Design Book) .	[4]	2	3
	b) A hydraulic cylinder has a piston diameter of 70 mm and rod diameter of 50 mm connected in a circuit where pump flow rate is 25 lpm and working pressure 100 bar. Calculate speed and during extension and retraction. Also evaluate force acted during extension stroke.	[4]	2	3
	c) The piston diameter is 75 mm and rod diameter 65 mm. The $Q_{\text{extension}} = 5 \text{ LPM}$ and $Q_{\text{retraction}} = 3 \text{ LPM}$. Calculate the speed of extension stroke. The Regenerative circuit is used to increase the speed of extension. Interpret the speed of extension stroke with regenerative circuit.	[4]	2	3

Q3.	a) Compare pressure reducing and pressure relief valve OR	[2]	3	2
	b) Compare any two methods of actuation a DCV	[2]	3	2
	c) Discuss the self-explanatory circuit with unloading valve (only diagram)	[4]	3	2
Q4	a) Interpret applications of meter in Meter out circuits (No sketch) OR	[2]	4	3
	b) Demonstrate parallel and series type of synchronization.	[2]	4	3
	c) How regenerative circuit use to increase speed of extension stroke? Justify with circuit diagram.	[4]	4	3
Q.5	a) With the help of suitable DCV and actuator sketch the circuit of single acting cylinder OR	[2]	5	2
	b) Explain Function of FRL Unit	[2]	5	2
	c) Draw a circuit with shuttle valve and explain the OR logic.	[4]	5	2
Q.6	a) Maximum Pressure in circuit is 60 bar and maximum discharge is 5 LPM. Suggest the actuator and reservoir used for the circuit. OR	[2]	6	3
	b) The area is $2 \times 10^{-3} \text{ m}^2$, velocity is 0.03 m/sec. Estimate type of tank required.	[2]	6	3
	c) During the operation in a hydraulic circuit the force during extension stroke is 15 KN with a velocity of 1 m/min. During retraction the load is 5 KN and velocity is 2.5 m/min. Evaluate Pressure and discharge during both strokes (Use design book).	[4]	6	3

Note : [BT level 1: Remember 2:Understand 3: Apply 4: Analyse 5: Evaluate 6: Create]