ADDITIONAL CONTROLLER OF EXAMINATIONS
AU
CHENNAI
600 025

Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, Nov / Dec 2024

Manufacturing

VII Semester

ME5451 – Hydraulics and Pneumatics

(Regulation 2019)

Time: 3 hrs

Max. Marks: 100

CO 1	Applying the working principles of fluid power systems and hydraulic pumps
CO 2	Applying the working principles of hydraulic actuators and control components
CO 3	Designing and develop hydraulic circuits and systems
CO 4	Applying the working principles of pneumatic power system and its components
CO 5	Solving problems and troubles in fluid power systems

BL – Bloom's Taxonomy Levels

(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analyzing, L5 - Evaluating, L6 - Creating)

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

Q. No.	Questions	Marks	CO	BL
1	List two advantages of using variable displacement pumps.	2	CO 1	L2
2	What is meant by friction loss in a hydraulic system?	2	CO 1	L2
3	State two applications of rotary actuators.	2	CO 2	L2
4	Define the function of a pressure switch.	2	CO 2	L1
5	State the function of a pump unloading circuit.	2	CO 3	L2
6	Define hydrostatic transmission.	2	CO 3	L1
7	What is a muffler, and where is it used in pneumatic systems?	2	CO 4	L2
8	What is a pneumatic logic circuit?	2	CO 4	L1
9	What is the purpose of a hydraulic power pack?	2	CO 5	L1
10	Give two probable causes of pump delivering insufficient or no oil in the hydraulic system.	2	CO 5	L2

PART- B (5 x 13 = 65 Marks)

Q. No.	Questions	Marks	CO	BL
11 (a)	Discuss in detail the properties of hydraulic fluids. How do these properties influence the selection of fluids for a specific application?	13	CO1	L2
	OR			
11 (b)	Describe the construction and working principle of radial piston pump with neat sketch.	13	CO1	L2

12 (a)	Demonstrate the working principle of unloading valve and sequence valve with neat sketches.	13	CO2	L3
	OR			
12 (b)	Explain the role of hydraulic system accessories such as filters and their types. Discuss the selection criteria for filters.	13	CO2	L3
13 (a)	Design and explain the hydraulic power circuit for sequencing of clamping and drilling operations on a workpiece in a drilling operation, and after drilling, the respective cylinders come to their original positions.	13	CO3	L3
	OR			
13 (b)	Design and discuss the working principles of fail-safe circuit for over load protection with suitable circuit diagram.	13	CO3	L3
14 (a)	Design a pneumatic circuit for the following sequence using the cascade method A-B-B+A+ where the + cylinder extension and - cylinder retraction.	13	CO4	L4
	OR			
14 (b)	With the help of pneumatic moving logic (MPL), construct the NAND and Exclusive OR logic circuits with a truth table and explain their applications.	13	CO4	L3
15 (a)	Design and explain a circuit using hydraulic components for the worktable movement in the milling machine.	13	CO5	L4
	OR			
15 (b)	Describe the most probable causes of faults and how to troubleshoot them for filters, regulators, and lubricators in the pneumatic system.	13	CO5	L4

PART- C (1 x 15 = 15 Marks)
(Q.No.16 is compulsory)

Q. No.	Questions	Marks	CO	BL
16.	Explain how the wall-attached bistable fluidic amplifier functions to switch between two stable states. Describe its construction, including the inlet, output, vent ports, and the fluidic control inputs, and how it is used to construct the AND and OR logic gates for digital applications with suitable sketches.	15	CO4	L5

CONTROLLER OF EXAMINATIONS ★ ADDITIONAL
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