Register Number:……..

KUMARAGURU
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B.E. DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Fourth Semester

MECHATRONICS ENGINEERING

U18MCI4201: Hydraulics and Pneumatics

COURSE OUTCOMES

CO1: Describe the concept of fluid power and different types of fluid power systems.
CO2: Explain the working principles of different types of hydraulic pumps.
CO3: Discuss the working principles of different types of hydraulic actuators.
CO4: Summarize the working principles of compressors and pneumatic components.
CO5: Design hydraulic and pneumatic circuits for simple applications.
CO6: Explain the concept of fluid logic control systems, maintenance of fluid power systems.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Give any two advantages of Hydraulics over Pneumatics	CO1	[K2]
2.	Sketch the symbol for FRL and variable displacement pump	CO1	[K_2]
3.	How do you classify pumps?	CO2	[K_2]
4.	Infer the function of a hydraulic motor and give one applications of it.	CO3	[K_2]
5.	What is the significance of shuttle valve?	CO3	[K_2]
6.	State the functions of accumulator in hydraulic circuit.	CO4	[K_2]
7.	Write down the various properties of air.	CO4	[K_2]
8.	Recall the use of quick exhaust valve in pneumatics	CO5	[K2]
9.	What is a significance servo valve?	CO6	[K_2]
10.	Mention the possible causes for '*Hydraulic oil leakage.*'	CO6	[K_2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Briefly explain the various properties of oils used in fluid power applications.	10	CO1	[K_2]
	b)	Sketch a block diagram for a hydraulic system.	06	CO1	[K_2]
12.	a)	Summarize the applications of fluid power system.	06	CO1	[K_3]
	b)	Classify the fluid power system. Explain about different control elements used in the system.	10	CO2	[K_2]
13.	a)	Explain the working of a piston pump with a neat sketch.	08	CO2	[K_2]
	b)	With suitable sketch describe the construction and operation of a telescopic cylinder, state its applications.	08	CO3	[K_2]
14.	a)	With a neat sketch, explain the working principle of pressure sequencing valve with its application circuit.	10	CO3	[K_3]
	b)	With a neat sketch explain the construction and working of Air Filter	06	CO4	[K_2]
15.		Design a Pneumatic system in which cylinder 'A' is used to clamp the work piece, cylinder 'B' is used for punching and cylinder 'C' removes the work piece from the station, as per the following sequence of operation. A+ B+B-A-C+C-.	16	CO5	[K_3]
16.		Double acting cylinder is used to perform machining operation. Pneumatic cylinder is advanced by pressing two push buttons simultaneously. If any one of the push button is released, cylinder comes back to start position. Draw the pneumatic circuit, PLC wiring diagram and ladder diagram to implement this task.	16	CO6	[K_3]

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