Register Number:……..

KUMARAGURU
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B.E DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Seventh Semester

AUTOMOBILE ENGINEERING

U18AUE0019: Applied Hydraulics and Pneumatics

COURSE OUTCOMES

CO1: Understand the Fluid properties and functions and applications of Fluid Power.
CO2: Describe the concept used to design the systems.
CO3: Illustrate the working of hydraulic components.
CO4: Summarize the working of pneumatic components.
CO5: Design and implement simple fluid power systems common in industrial applications using commercial components.
CO6: Familiarize the actual fluid power circuits used in Automotive and Industrial Applications.

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

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

1.	List any four advantages of using the fluid power.	CO1	[K_1]
2.	Differentiate Open loop and Closed Loop System with an example.	CO2	[K_2]
3.	State Pascal's Law.	CO1	[K_1]
4.	Draw the graphical representations of 4/3 way and 5/2-way valve.	CO3	[K_2]
5.	Explain the significance of adding additives to Hydraulic Fluids.	CO4	[K_2]
6.	Distinguish between pressure control valve and pressure relief valve	CO2	[K_2]
7.	Mention some application of cylinder sequencing.	CO6	[K_2]
8.	Given the significance of regenerative circuit.	CO6	[K_2]
9.	Draw the equivalent electrical and pneumatic symbols for AND gate function.	CO5	[K_2]
10.	List any four advantages that PLC's provide over electromechanical relay control systems.	CO5	[K_1]

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

11.	With a neat sketch explain the components involved and the working principle of a basic hydraulic system.	16	CO1	[K_2]

12.	a)	Two hydraulic cylinders are connected at their piston ends (cap ends rather than rod ends) by a single pipe. Cylinder A has a diameter of 100 mm and cylinder B has a diameter of 750 mm. A retraction force of 1760 N is applied to the piston rod of cylinder A. Determine the following: (a) Pressure at cylinder A. (b) Pressure at cylinder B. and (c) Pressure in the connection pipe.	8	CO2	[K_3]
	b)	In hydraulic jack input cylinder with a diameter of 45 mm is connected to an output cylinder with a diameter of 105 mm. A force of 1600 N is applied to the input cylinder. Calculate, (a) the output force (b) how far the input cylinder needs to move to lift the output cylinder 200 mm? (c) the work done by both the pistons.	8	CO2	[K_3]
13.	a)	Develop an electro hydraulic circuit (Cascade method) for the stamping operation in the following sequence A+B+B-A- where A and B stands for cylinders + indicate extension and – indicate retraction of cylinders.	10	CO6	[K_4]
	b)	Design a hydraulic sequence circuit for a drilling machine with one cylinder for operating the power vice jaw and the other for controlling the cutler travel.	6	CO6	[K_4]
14.	a)	Draw and explain the functions of pneumatic check valve.	10	CO3	[K_2]
	b)	Discuss the functions of FRL Unit.	6	CO3	[K_2]
15.	a)	Design and explain the working of a regenerative circuit.	8	CO4	[K_4]
	b)	Design and explain the working of a sequencing circuit.	8	CO4	[K_4]
16.	a)	Explain the working principle of a PLC with neat block diagram.	10	CO5	[K_2]
	b)	Describe PLC applications in fluid power control.	6	CO5	[K_2]

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