KUMARAGURU college of technology
character is life

Register Number:……..…

M.E DEGREE EXAMINATIONS: JUNE 2016

(Regulation 2015)

Second Semester

CAD/CAM

P15CCTE21**:** Design of Hydraulic and Pneumatic Systems

COURSE OUTCOMES

CO1: Demonstrate the working of different types of pumps

CO2: Explain the working of control components of hydraulics

CO3: Draw hydraulic circuits for various applications

CO4: Explain the fundamentals of pneumatics and construct pneumatic circuits

CO5: Construct special circuits

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

Answer all the Questions:-
PART A (10 x 1 = 10 Marks)

1. Assertion (A): Pneumatics does not provide good accurate positioning. CO1 [K_1]

   Reason (R): It uses compressible fluid.

   a) Both A and R are true
   b) A is true but R is not correct
   c) R is true but A is not true
   d) Both A and R are false

2. Hydraulic systems are preferred for CO1 [K_1]

   a) Low load applications
   b) Low pressure applications.
   c) High load applications.
   d) High pressure applications.

3. Pressure control valve is a CO2 [K_1]

   a) Either a normally closed or normally opened valve
   b) Normally closed valve
   c) Normally opened valve
   d) Direction control valve

4. Matching type item with multiple choice code CO2 [K_1]

List I	List II
A. Pressure relief valve	i. Flow control valve
B. Gate valve	ii. Pressure control valve
C. Hydraulics	iii. Stores the potential energy of fluid
D. Accumulator	iv. High load applications

	A	B	C	D
a)	i	ii	iii	iv
b)	ii	i	iv	iii
c)	iii	ii	i	iv
d)	iv	iii	ii	i

5. Assertion (A): Pressure sequencing valve is a pressure control valve. CO2 [K_1]
Reason (R): It operates based on the pressure setting and required sequencing of operations.
a) Both A and R are false b) Both A and R are true
c) R is true but A is not true d) A is true but R is not correct

6. The speed of the cylinder piston at the end of the stroke can be reduced by means of CO3 [K_1]
a) Cylinder cushioning mechanism b) Piston seals
c) End cups d) Spring

7. Pilot operated check valve is a CO2 [K_1]
a) Flow control valve b) Direction control valve
c) Pressure control valve d) Control both flow and direction

8. Assertion (A): Meter-in-circuit is a speed control circuit. CO3 [K_1]
Reason (R): It control incoming flow rate.
a) Both A and R are true b) Both A and R are false
c) A is true but R is not correct d) R is true but A is not true

9. Quick exhaust valve is fitted CO4 [K_1]
a) Nearer to the cylinder port b) Nearer to the relief valve
c) Away from the cylinder port d) Nearer to the direction control valve

10. In pneumatic systems the air flows through the following sequence CO5 [K_1]
a) Regulator, filter, lubricator b) Filter, regulator, lubricator
c) Filter, cylinder, lubricator d) Lubricator, compressor, cylinder

PART B (10 x 2 = 20 Marks)

11. What is meant by positive displacement pump? CO1 [K_2]
12. Mention the types of rotary actuators. CO1 [K_2]
13. Draw the symbol for pressure relief valve. CO2 [K_2]
14. Give the function of unloading valve. CO2 [K_1]
15. List the different types of accumulators. CO3 [K_1]
16. State the function of pressure intensifier. CO3 [K_1]
17. Explain the function of FRL unit. CO4 [K_2]
18. What is the purpose of providing quick exhaust valve in a pneumatic circuit? CO4 [K_2]

19.	Define low cost automation.	CO5	[K_2]
20.	Name the basic elements of a PLC.	CO5	[K_1]

PART C (10 x 5 = 50 Marks)

21.	Draw and explain the construction and working of Internal gear pump.	CO1	[K_2]
22.	Explain the working of cylinder cushioning mechanism with neat sketch.	CO1	[K_2]
23.	Construct and explain the working principle of counter balance valve with neat sketch.	CO2	[K_2]
24.	Briefly explain the working of pressure compensated flow control valve with neat diagram.	CO2	[K2]
25.	Draw the circuit for varying the working speeds of a hydraulic cylinder during in its forward stroke.	CO3	[K_2]
26.	Explain the working of punching press circuit using double pump with neat sketch.	CO3	[K_2]
27.	Discuss the working of lubricator unit in pneumatics with neat sketch.	CO4	[K_2]
28.	Draw and explain the working principle of an reciprocating air compressor.	CO4	[K_3]
29.	Write short notes on ladder logic diagrams.	CO5	[K_3]
30.	Briefly explain the working of twin pressure valve and shuttle valve.	CO5	[K_3]

Answer any TWO Questions
PART D (2 x 10 = 20 Marks)

31.	With a neat sketch explain the principle, construction and working of bend axis piston pump.	CO1	[K_3]
32.	Consider an automatic drilling machine. The complete cycle is as follows: cylinder A extends to clamp the work piece, then cylinder B extends to drill a hole and then retracts. Cylinder A then retracts to unclamp the work piece. Design a control circuit by applying cascade method.	CO4	[K_3]
33.	Explain any two applications of an accumulator with neat circuit.	CO3	[K_3]

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