B.E. Sixth Semester (Instrumental Engineering) (CGS)

10799 : Control System Components : 6 IE 01

P. Pages : 2 | AU - 2790

Time : Three Hours | Max. Marks : 80

* 0 8 6 0 *

Notes : 1. Assume suitable data wherever necessary.
2. Illustrate your answer necessary with the help of neat sketches.
3. Use of non programmable calculator is permitted.
4. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) Compare proportional, integral, Derivative and PID controllers with respect to stabilization time offset and peak error. 7

b) A controller has the following functions in cascade $(T_1s+1),(T_2s+1)$ and $\frac{1}{T_3s}$. 7

What parameters determine derivate time, proportional sensitivity and reset time?

OR

2. a) What do you understand by reset wind-up? Suggest measures for preventing reset wind-up. 7

b) Explain the process Reaction curve method of controller tuning. 7

3. a) Write the procedure for selection of control valves. 6

b) The area of opening of a valve versus lift is given by $A = a + bx^2$. Derive the flow versus lift characteristic of this parabolic valve. (Note : a & b are constants). 7

OR

4. a) What are the various sources of noise in the control valve? Suggest remedy to minimize it. 6

b) An equal percentage valve has a maximum flow of $50cm^3/s$ and a minimum of 2 Cm^3/s. If the full travel is 3cm, find the flow at 1cm opening. 5

c) Define Rangeability. 2

5. a) What is hydraulic filter? Why is it required? 6

b) Explain with suitable diagram the pumped controlled hydraulic system. 7

OR

6. a) Draw and explain the hydraulic circuit for meter in. 6

b) Explain the construction & working of following hydraulic valves: 7
i) Slide valve. ii) Flapper valve

7.		What is the role of compressor in a pneumatic system? Enlist different types of compressors and explain the construction and working of any three compressors.	13

OR

8.	a)	Draw and explain pneumatic, circuit for sequencing.	6
	b)	Explain air motor type pneumatic actuator using suitable diagram.	7
9.		Explain construction and working of i) DIP switch, ii) Selector switch & iii) Thumbwheel switch	13

OR

10.	a)	Give symbolic representation of various types of switches.	5
	b)	Explain construction and working of i) Selector switch & ii) Micro switch.	8
11.	a)	Discuss the construction and operation of a solid state relay.	6
	b)	What are the different types of reed-relay. Explain each in brief.	5
	c)	Discuss the design features of reed relays.	3

OR

12.	a)	Enlist limitations of electromechanical relays.	4
	b)	Describe the characteristics of electro-mechanical relays.	5
	c)	Compare electromechanical relays with Solid-State relays.	5

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