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SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar - 388120

B. Sc. (5th Semester) Examination - 2020 US05CINV22 (Control System Components and Technique - I)

Day and Date:54 43day, 26/12/2020 Time: 0200 pm to 04.00 pm

Maximum Marks: 70

Que 1	Multiple Choice Type Questions.			[10]		
1	is a temporary variation of one of	the	load parameters.			
1	a) Transient	b)	Process load	165.2		
	c) Self-regulation	d)	Dead time	1121		
2	Process variable under control is know	-		1 TE		
-	a) Controlling variable		Controlled variable	Mai LIE		
	c) Process lag		Variable range	1 *		
3	The range of error to cover 0-100 % controller output is known as					
0	a) Proportional gain	b)	Offset			
	c) Proportional band		Integral time			
4	Difference between set value and process value is known as					
	a) Process lag	b)	Direct action			
	c) Control parameter range	d)	Error			
5	1 11 11					
	a) Humid	b)	Dry			
	c) Oil-free		Clean			
6	Which of the following is not the crite	erion	for designing of instrument			
	air system?					
	a) Sizing criteria		Valve selection			
	c) Pressure level	d)	Compressor selection			
7	Water in the control lines do not cause					
	a) Corrosion	-	Scaling			
	c) Polishing	d)	Blockage			
8	is a magnetic switch.					
	a) Photodarlington pair	b)	Zener diode			
	c) Solid-state relay		Electromechanical relay			
9	consists of a coil and both station	nary	and moving contacts.			
			Stepper motor			
	c) Solid-state relay		Varactor diode			
10	is nothing but a DC motor that moves in steps and each step can be					
	controlled with precision.					
	a) Servo motor		Stepper motor			
	c) Actuator	d) Rotary pump			
Que 2	Fill in the blanks and True – False.			[80]		
1	Control system itself takes some time called	in re	eaching set value of process is			
2	The unit of proportional gain is					

use semiconductor devices such as bipolar transistors, MOSFETs, 3 SCRs, or triacs. The zero of electrical control signal is ____. 4 Derivative control mode can not be used alone in the process control 5 industry (TRUE/FALSE). Many solid-state relays used to control AC loads have a feature known 6 as zero switching (TRUE/FALSE). 7 The rangeability of a control valve is defined as the ratio of maximum controllable flow to minimum controllable flow (TRUE/FALSE). Actuators are mechanical or electro-mechanical devices that provide 8 controlled and sometimes limited movements or positioning which are operated electrically, manually, or by various fluids such as air, hydraulic, etc (TRUE/FALSE). Short Answer Questions (Attempt any 10 out of 12). [20] Que 3 Define: Process lag and Self-regulation. 1 The temperature has a range of 300 to 440 K and a set point of 384 K. 2 Find the percent of span error when the temperature is 379 K. Write on variable range and control parameter range. 3 Give an account of screw compressor. 4 Explain briefly liquid piston compressor. 5 Explain centrifugal compressor briefly. 6 What is relay? Enlist types of relays. 7 LIBRAR What is timing relay? 8 9 What is control valve? Enlist types of stepper motors. 10 How stepper motor works? 11 What is an actuator? 12 Long Answer Questions (Attempt any 04 out of 08). [32] Que 4 What do you mean by discontinuous control system? Write a note on 1 ON-OFF control system. What do you mean by continuous control system? Explain proportional 2 control system in detail. Explain dryer in detail. 3 Write a detailed note on compressor cooling. Also explain instrument 4

- air distribution system. Write a note on electromechanical control relay with necessary 5
- Give an account of solid-state relay with necessary diagram.
- Write a note on permanent magnet stepper motor and variable 7 reluctance stepper motor with necessary diagrams.
- Give advantages of stepper motor. Enlist its applications. Explain hybrid 8 stepper motor in detail with necessary diagram.

