

TC05 - Pre-Instructional Survey

Name: _____ Date: _____

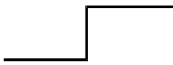
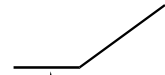
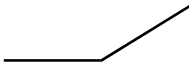

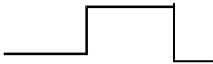

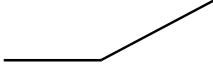
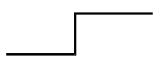
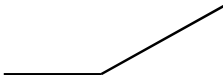
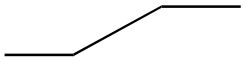
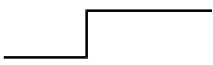
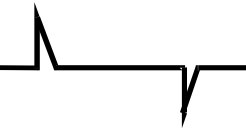
1. A closed loop feedback control system must have the minimum number of components or elements:
 - a. 3
 - b. 2
 - c. 4
 - d. No minimum number
 - e. Any number

2. Feedback control is based on the measurement of which variable?
 - a. Disturbance
 - b. Controlled
 - c. Manipulated
 - d. Uncertain
 - e. None

3. Select the one sensor characteristic that is most likely to affect the total system gain:
 - a. Offset
 - b. Response time
 - c. Accuracy
 - d. Range
 - e. All of the above

4. Which of the following will normally be selected to provide "fail safe" conditions on a process?
 - a. Controller action
 - b. Transmitter range
 - c. Valve operation
 - d. Controller type
 - e. Any of the above

Match the following output response for the given input response.

<u>Control mode</u>	<u>Input</u>	<u>Answer</u>	<u>Output</u>
5. proportional		_____	a. 
6. proportional		_____	b. 
7. integral		_____	c. 
8. integral		_____	d. 
9. derivative		_____	e. 
10. derivative		_____	f. 

11. Proportional control operates on:

- a. Amount of error
- b. Time of error
- c. Rate of change of error
- d. Presence of error
- e. Disturbance

12. Integral control operates on

- a. Amount of error
- b. Time of error
- c. Rate of change of error
- d. Presence of error
- e. Disturbance

13. Derivative control operates on:

- a. Amount of error
- b. Time of error
- c. Rate of change of error
- d. Presence of error
- e. Disturbance

14. On-off control operates on:
- Amount of error
 - Time of error
 - Rate of change of error
 - Presence of error
 - Disturbance
15. The following should not respond to a setpoint change:
- Proportional
 - On-off
 - Reset
 - Cascade
 - Derivative
16. Control system tuning:
- Can help analyze problems in a control system.
 - Can best be accomplished in a steady state condition.
 - Is a means to match the dynamic characteristics of components in a control system.
 - Requires analysis of a transfer function.
 - Is usually done by a computer function of the controller.
17. Cascade control has an advantage over single element control systems when:
- Precise control is required
 - Control variable time constants are about equal
 - Control variable dead times are about equal
 - There is no dead time
 - There is considerable difference in control system time constants
18. Feedforward control:
- Anticipates the effect of a process change as well as disturbances
 - Responds to disturbance variables
 - Requires measurement of control variables
 - Does not have offset
 - Requires digital controllers and calculations

19. Feedback controller tuning:
- a. requires self tuning controllers
 - b. Is similar to feedback tuning features
 - c. May be empirical or analytical
 - d. Is normally not necessary with feedback trim control
 - e. May cause process cycling
20. Ratio Control requires
- a. One controller
 - b. Two controllers
 - c. No controllers
 - d. A or B
 - e. None of the above


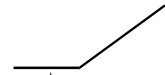
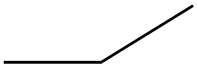

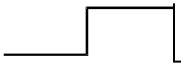

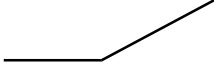
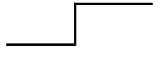
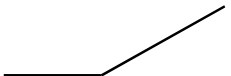
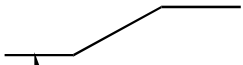
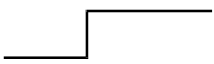
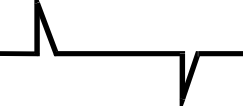
TC05 - Pre-Instructional Survey Answers

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1. c. 4
2. b. Controlled
3. d. Range
4. c. Valve operation

Match the following output response for the given input response.

<u>Control mode</u>	<u>Input</u>	<u>Answer</u>		<u>Output</u>
5. proportional		<u>d</u>	a.	
6. proportional		<u>a</u>	b.	
7. integral		<u>e</u>	c.	
8. integral		<u>c</u>	d.	
9. derivative		<u>d</u>	e.	
10. derivative		<u>b</u>	f.	

11. a. Amount of error
12. b. Time of error
13. c. Rate of change of error
14. d. Presence of error
15. e. Derivative
16. c. Is a means to match the dynamic characteristics of components in a control system.
17. e. There is considerable difference in control system time responses
18. b. Responds to disturbance variables
19. c. May be empirical or analytical
20. d. A or B