Class Test No. 08 Monday 09th Sep 2019 Duration: 10 Minutes Closed notes

Name: _____ Roll No. _____

Choose only one option which is the most appropriate for questions 1 - 5.

1. A type '2' system will exactly track

(a) parabolic input only
(b) ramp input only
(c) both ramp and step inputs
(d) all three i.e. step, ramp and parabolic

2. In the case of 'I' control, control input will go to zero when

(a) error rate is zero
(b) instantaneous error is zero
(c) cumulative error is zero
(d) the system is of 1st order

3. 'P' control influences

(a) all performance attributes
(b) only stability and tracking
(c) only tracking and disturbance rejection
(d) only stability and disturbance rejection

4. For a 1st order system, the parameters used for specifying disturbance rejection are

(a) peak time and settling time
(b) time constant and settling time
(c) rise time and settling time
(d) dead time and settling time

5. For a type '0' system, tracking error to an unit impulse input is

(a) 1
(b) 0
(c) ∞
(d) not defined

Give short (1 - 2 lines) answer to the questions 6-10

6. Give the statement of final value theorem relating e(t) and E(s) as $t \to \infty$

$$\lim_{t\to\infty} e(t) = \lim_{s\to 0} sE(s)$$

.... 2 (PTO)

7. Give the expression for control input 'U(s)' in the context of 'D' control in terms of 'E(s)' and derivative gain, K_D.

$$U(s) = K_D s E(s)$$

8. What is the main purpose for employing the PI control?

The main purpose of employing PI control is to achieve the desired tracking performance.

9. What are the primary requirements of disturbance rejection?

The primary requirements of disturbance rejection are minimum departures and minimum time to settle back to original state.

10. Give the expression of the steady-state error, 'e_{ss}', to a step input for a type '0' system in terms of the position error constant, K_p.

$$e_{ss} = \frac{1}{1 + K_p}$$