

B.TECH. SEM -IV E & TC 2014 COURSE (CBCS) : SUMMER - 2018

SUBJECT: CONTROL SYSTEM ENGINEERING

Day : **Thursday**
Date : **07/06/2018**

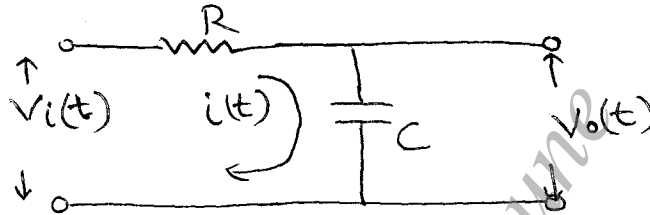
S-2018-2317

Time: **10.00 AM TO 01.00 PM**
Max. Marks: 60

N.B.:

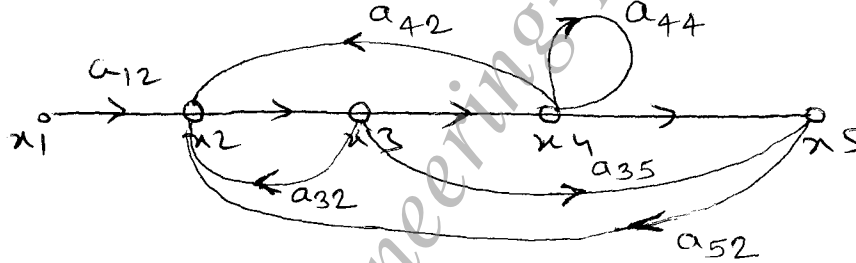
- 1) All questions are **COMPULSORY**.
- 2) Figures to the write indicate **FULL** marks.
- 3) Use suitable data if necessary.

- Q.1 a)** What is the different between feedback control system and feed forward control system? (04)
- b)** Find out T.F. of following electrical system (06)



OR

- a)** Find out T.F. of following signal flow graph. (07)



- b)** What is feed forward control system? Give its example. (03)
- Q.2 a)** How capacitive Transducer does works and enlist its applications. (07)
- b)** What are the application of flow meter? (03)

OR

- a)** What is Transducer? Classify Transducers in detail. (06)
- b)** What is Thermistor? How does it works? (04)
- Q.3 a)** Define K_p , K_v , K_a . Derive formula for each. (06)
- b)** What are the rules of Root locus technique? (04)

OR

Sketch the root locus for unity feedback system with open loop transfer (10)

function for following points. $G(s) = \frac{k}{s(s^2 + 4s + 8)}$

- i) No. of Loci
- ii) No. of Asymptotes
- iii) Angle of asymptotes of their real axis intercept
- iv) Angle of departure
- v) Imaginary Axis intercept.

- Q.4 a)** What is stability? What is the effect of poles and zeros on stability of the system? (06)

- b)** Find out Routh Array (04)

a) $s^5 + 6s^4 + 15s^3 + 30s^2 + 44s + 24 = 0$

b) $s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$

OR

Find (10)

- i) Range of k for stability
- ii) Determine value of k so that system is marginally stable.
- iii) Find the frequency of oscillations.

For

i) $F(s) = s^4 + 22s^3 + 10s^2 + s + k = 0$

ii) $F(s) = s^3 + 3ks^2 + (k+2)s + 4 = 0$

Q.5 a) What are the frequency domain specifications? Explain. **(05)**

b) What is Nyquist stability criteria? **(05)**

OR

Sketch the bode plot, showing magnitude in decibels and phase angle in **(10)**

degrees as a function of log frequency For T.F. $G(s) = \frac{10}{s(1+0.5s)(1+0.01s)}$

Q.6 a) What is PI, PD and PID controller? **(06)**

b) What is lead lag compensator? **(04)**

OR

a) What is on / off controller, explain with ladder diagram example? **(06)**

b) What is importance of control system in industrial applications? **(04)**

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