Total No. of Questions : 8]

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SEAT No. :

[Total No. of Pages : 2

S.E. (Electronics & Telecommunication) CONTROL SYSTEM (2019 Pattern) (Semester - IV)

Time : 2¹/₂ Hours]

Instructions to the candidates:

[Max. Marks : 70

- 1) Solve question Q.1 or Q.2, Q.3 or Q.4, Q.5or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Assume the suitable data, if necessary.

Q1) a) The characteristics equation of closed loop system is given as $1 + G(s) H(s) = s^6 + 2s^5 + 8s^4 + 12s^3 + 20s^2 + 16s + 16$. Check the stability of system and determine number of closed loop pole lies in RHP of s plane. [8]

b) A unity feedback system with open loop transfer function $G(s) = \frac{k}{(s+1)^4}$.

Plot root locus.

- Q2) a) The Characteristics equation of closed loop system is given as 1 + G(s)H(s) = s³ + 7s² + 25s + 39 = 0. Determine the number of roots which are lying on left half side of $\sigma = -1$. [8]
 - b) Plot a root locus for the system

G(s) H(s) =
$$\frac{k}{s(s+4)(s^2+4s+13)}$$
 0 < k < ∞ .

) [10]

[10]

(Q3) a) Construct Nyquist plot and find Phase crossover frequency and gain margin if : $G(s)H(s) = \frac{1}{s(s+1)(s+2)}$. Also comment on Stability. [9]

b) State the Limitations of frequency domain approach. [8]

