B.Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Third Year)

ELECTRONICS & COMMUNICATIONS

Paper - I : Linear Control Systems

Time : 3 Hours   **Maximum Marks : 75**

Answer question No.1 compulsory   ***(15)***

Answer ONE question from each unit   ***(4 × 15 = 60)***

1)　a)　Define time variant systems.

　　b)　How root loci are modified when a zero is added to open loop transfer function?

　　c)　What is open loop transfer function?

　　d)　What are the advantages in design using root locus?

　　e)　Define conditional stability?

　　f)　Draw the bode plot of lag compensator.

　　g)　What is the significance of band width?

　　h)　What is lead compensation?

　　i)　What is an asymptote in a Bode plot?

　　j)　What is a polar plot?

　　k)　What happens to setting time if a pole at origin is added to a system?

　　l)　Define phase trajectory.

　　m)　What is feedback compensation?

n)   Define observability.

o)   What is Nichols chart?

UNIT - I

2) a)   Give the guidelines to form the state model of mechanical rotational systems.

b)   Explain the effect of feedback on overall gain.

OR

3) a)   Explain the functioning of a synchro.

b)   Derive the total transfer function of a simple closed loop with negative feedback.

UNIT - II

4) a)   Find the stability if
$P(s) = s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5 = 0$.

b)   Draw the time response law of a typical second order system and explain salient features.

OR

5) a)   Explain Routh - Hurwitz criterior. Find $F(s) = s(s + 2)^2 (s + 3)$

b)   Explain the effect of adding poles and zeros an overshoot.

UNIT - III

6)   For a unity feedback system $G(s) = (800(s + 2))/(s^2(s + 10)(s + 40))$. Sketch bode plots and comment upon its stability.

OR

7)   Give the salient features of Nyquist stability criterion.

UNIT - IV

8) a)   Explain the terms controllability and observability.

b)   Explain the significance of Eigen values and Eigen vectors.

OR

9)   Sketch the root locus for a system with unity feedback and open loop transfer given by $G(s) = ((s + 4) (s + 40)) / (s^3(s + 200)(s + 900))$.

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