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Question Paper Code: 32522

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Fourth Semester

Electronics and Communication Engineering

01UEI422 – LINEAR CONTROL ENGINEERING

(Regulation 2013)

Duration: 1:45 hour

Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

(Answer any ten of the following questions)

1. What is feedback? What are the components of feedback control system?
2. Write Mason's Gain formula.
3. Why derivative controller is not used in control systems?
4. List the time domain specifications.
5. List out the different frequency domain specifications.
6. Define Phase cross over and Gain cross over frequency.
7. State Nyquist stability criterion.
8. Define Relative stability. What is the necessary condition for stability?
9. What are the advantages of State Space analysis?
10. Write the state model.
11. What do you mean by an open loop control system?
12. Write Mason's gain formula and its purpose.
13. Why are test signals needed?

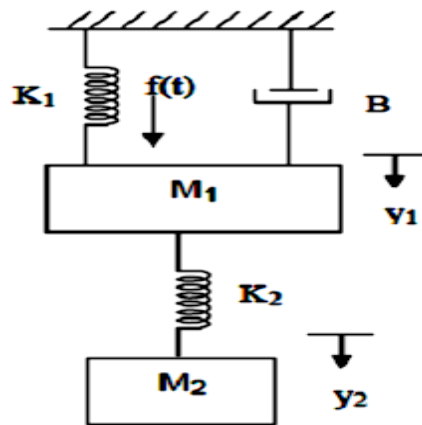
14. What is steady state error?

15. List out the different frequency domain specifications.

PART – B (3 x 10= 30 Marks)

(Answer any three of the following questions)

16. Write the differential equations governing the mechanical system shown in figure and determine the transfer function. (10)



17. Derive the expression for the response of first order system for unit step input. (10)

18. A unity feedback control system has $G(s) = \frac{K}{s(s+4)(s+10)}$. Draw the Bode plot. Find K when phase margin 30° . (10)

19. Determine the range of values of K for the system to be stable.
 $s^3 + 3Ks^2 + (K + 2)s + 4 = 0$. (10)

20. Obtain the state model of the mechanical system shown in Fig. 4 by choosing a minimum of three state variables. (10)

