

Code No.: EC405PC

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CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II-B.TECH-II-Semester End Examinations (Regular) - June- 2022
CONTROL SYSTEMS
(ECE)

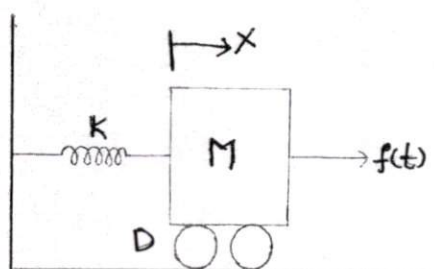
[Time: 3 Hours]

[Max. Marks: 70]

- Note:** 1. Answer any FIVE questions. Each question carries 14 marks.
2. All questions carry equal marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

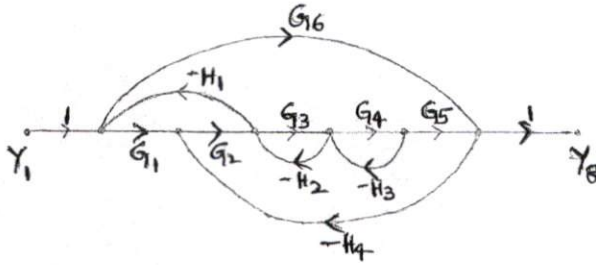
5X14=70

1. a) Determine the transfer function $F(S)/X(S)$ for the Mechanical Translation System shown in figure 6. [7M]

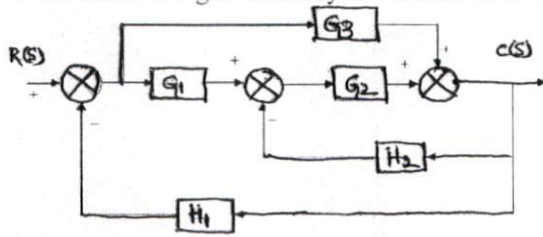


- b) Distinguish between Open Loop system and Closed Loop system? [7M]
2. a) The Open Loop transfer function of unity feedback control system is given by $G(S) = \frac{9}{S(S+3)}$ find the Natural Frequency of response? [7M]
b) Define Root Locus? Explain the Procedure of Root Locus with an example? [7M]
3. a) Draw the Bode Plot for the system having the transfer function $G(s) H(s) = 100 / s(s+1)(s+2)$. [7M]
b) Sketch the Polar Plot for the system with $G(s) H(s) = 10 / s(s+1)(s+2)$. Calculate its Gain Margin in dB. Hence comment on its stability. [7M]
4. a) Explain the Lead Compensator with neat sketch and locate their poles and zeros? [7M]
b) Obtain the transfer function of Lag networks. Locate their poles and zeros? [7M]
5. a) Explain various methods of Evaluation of State transition matrix? [7M]
b) Obtain the transfer function for linear time invariant system and also draw the state model? [7M]

6. a) Find the transfer function Y_8/Y_1 of the following signal flow graph? [7M]



b) Find the overall gain of the system shown below? [7M]



7. a) Explain error constants K_p , K_v and K_a for type I system? [7M]
 b) Using RH criterion, determine the stability represented by characteristic equation $s^4 + 2s^3 + 8s^2 + 4s + 3 = 0$. [7M]

8. a) Write short notes on various Frequency Domain specifications? [7M]

b) Explain the steps for the construction of Bode Plot? [7M]
