

Section-D

15 each

8. Write note on controllability and observability.
9. Explain how do we convert transfer function to state mode ?

Roll No. :

Total No. of Questions : 9]

[Total No. of Pages : 4

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B.Tech. (ECE) 6th Semester (Supplementary)

Examination, July-2021

(C Scheme)

CONTROL SYSTEMS

Paper-PCC-ECE-302-G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note :- Question No. 1 is compulsory. Attempt one question from each Section.

- I. Define the following :
 - (i) Closed loop control system
 - (ii) Asymptote
 - (iii) Test signals

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P.T.O.

(iv) Force-voltage analogy

(v) Transfer function

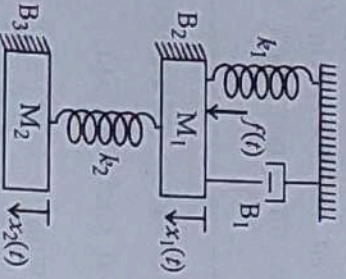
(vi) Damping ratio

$2\frac{1}{2} \times 6 = 15$

Section-A

15 each

2. Refer the mechanical system shown in figure. Obtain all the relevant cause effect equations and then draw electrical analog based force current analogy.



3. Explain all important rules for block diagram reduction.

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Section-B

15 each

4. Elaborate time domain specification of second order control system.
5. What do you understand by Routh Hurwitz criteria ? Explain with examples.

Section-C

15 each

6. Using Nyquist stability criterion, investigate the closed loop stability of a negative feedback control system where transfer function is given by :

$$GH(s) = \frac{K(sT_d + 1)}{s^3}; K, T_d > 0$$

7. Sketch the root locus plot for a negative feedback control system having an open loop transfer function :

$$G(s)H(s) = \frac{k}{s(s^2 + 2s + 2)}$$

for all values of k ranging from 0 to ∞ .

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