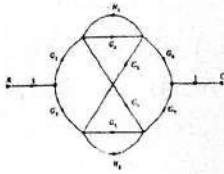


UNIT - I

2. (a) Develop the transfer function from the given signal flow graph applying Mason's gain formula. 7.5

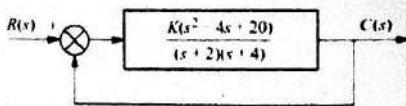


- (b) Differentiate between DC servomotor and AC servomotor. 7.5

3. Summarize the block diagram reduction rules with example. 15

UNIT - II

4. Sketch the root locus of the system. 15



5. (a) Determine the stability of the following system using Routh's criterion. 7.5

$$s^5 + 2s^4 + 24s^3 + 48s^2 - 50 = 0$$

- (b) State the guidelines for sketching root locus. 7.5

UNIT - III

6. Draw the Bode Diagram for the transfer function. 15

$$H(s) = -100 \frac{s}{s^3 + 12s^2 + 21s + 10}$$

7. (a) Derive the transfer function of a lag compensator network. 7.5

- (b) Summarize the correlation between time and frequency response. 7.5

UNIT - IV

8. (a) Obtain the solution of non-homogeneous state equation. 7.5

- (b) State and explain the properties of State transition matrix. 7.5

9. Find X(t), given : 15

$$x'(t) = \begin{bmatrix} 0 & 1 \\ -3 & -4 \end{bmatrix} x(t) \text{ for } x(0) = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$

Roll No.

3323

**B. Tech. 6th Semester (ECE)
Examination – May, 2023**

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 : Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

1. (a) Name two types of electrical analogous for mechanical system. 2.5 × 6
- (b) Define the transfer function.
- (c) State the uses of lag compensators.
- (d) Mention the standard test input signals.
- (e) State and explain the Mason's gain formula.
- (f) What is servomotor ?

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P. T. O.