Code No: 154AK

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, November/December - 2020
CONTROL SYSTEMS
(Electrical and Electronics Engineering)

Time: 2 hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks
- - -

1. Derive the transfer function between $Y_1(s)$ and $Y_2(s)$ for the following physical system using block diagram algebra shown in figure 1. [15]

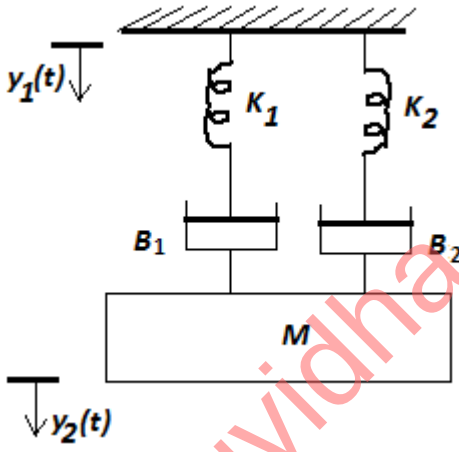

Figure: 1

2. Using block diagram algebra, find C_1/C_2 for the following shown in figure 2. [15]

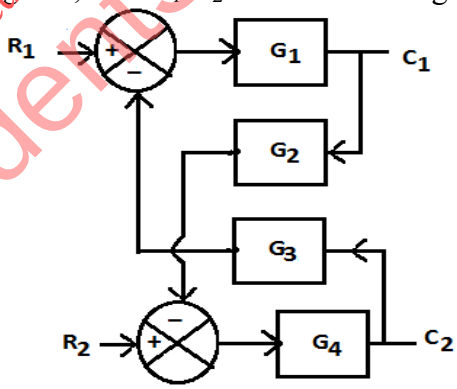

Figure: 2

3. The forward path transfer function for a unity feedback system is given by

$$G(S) = \frac{K(s+1)}{s(s+2)(s^2+s+3)}$$

Draw the root locus for $K \geq 0$. [15]

4. Using Routh stability criterion, determine the stability of the unity feedback control system with the following open loop transfer function [15]

$$\frac{C(s)}{R(s)} = \frac{3}{s(s+1)(s+5)}$$

5. Draw the polar plot for the forward path transfer function of a unity feedback control system which is given below $G(s) = \frac{1}{s(s+2)}$. [15]

6. The forward path transfer function of a unity feedback control system is

$$G(s) = \frac{6}{s^2(s+3)}$$

Sketch the Nyquist Plot. [15]

7. Explain in detail about lead compensation in design. [15]

8. With an example, explain the concept of observability and controllability. [15]

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