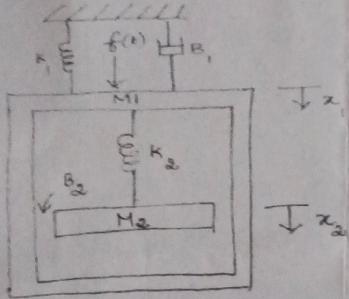
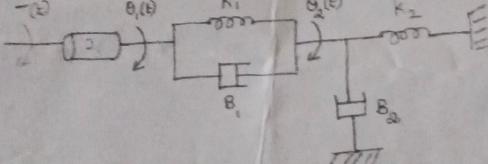
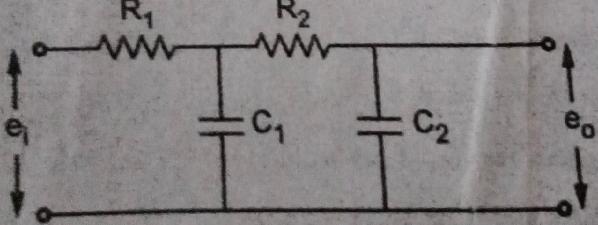
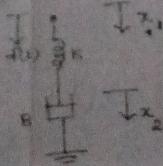


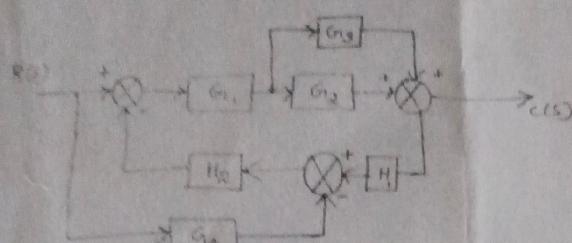
## CONTINUOUS INTERNAL EVALUATION- 1

|                  |                     |                      |                |
|------------------|---------------------|----------------------|----------------|
| Dept: EC         | Sem / Div: IV       | Sub: Control Systems | S Code: 18EC43 |
| Date: 05-07-2022 | Time: 9:30-11:00 am | Max Marks: 50        | Elective: N    |

Note: Answer any 2 full questions, choosing one full question from each part.

| QN            | Questions   | Marks | RBT | COs |
|---------------|---|-------|-----|-----|
| <b>PART A</b> |   |       |     |     |
| 1 a           | Draw the general block diagram of automatic control system and explain with example.  | 7     | L2  | CO1 |
| b             | For the mechanical system shown in fig . Draw the mechanical network ,write the differential equation and Draw the electrical network based on Force voltage analogy. | 9     | L3  | CO1 |
|               |   |       |     |     |
| c             | Write the torque equation of the rotational system shown in fig . Find the transfer function $\theta_2(s)/T(s)$   | 9     | L3  | CO1 |
|               |    |       |     |     |
| <b>OR</b>     |   |       |     |     |
| 2 a           | Find $E_o(s)/E_i(s)$ for the system given in Fig. 2.b   | 9     | L3  | CO1 |
|               |    |       |     |     |
| b             | Define Analogous system. Show that the two systems are analogous by comparing their transfer functions.   | 9     | L3  | CO1 |
|               |    |       |     |     |
| c             | For the block diagram shown in figure, determine the transfer function $C(s)/R(s)$ using block diagram reduction technique.   | 7     | L3  | CO2 |

### CONTINUOUS INTERNAL EVALUATION- 1

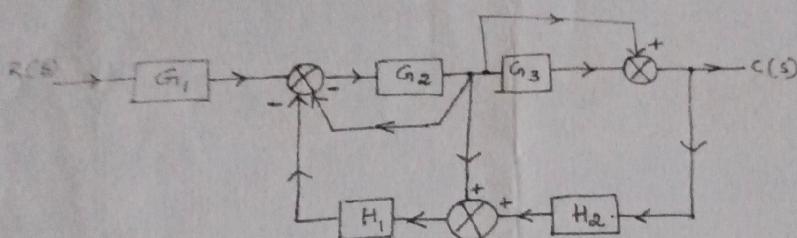


#### PART B

- 3 a For the block diagram shown in figure, determine the transfer function  $C(s)/R(s)$  using block diagram reduction technique.

9

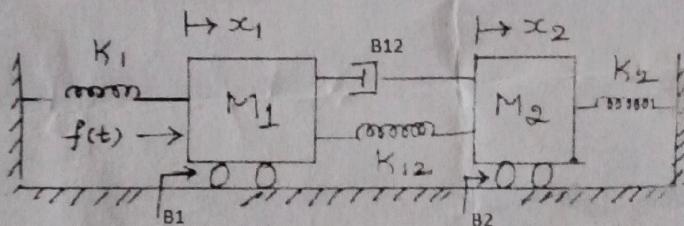
L3 CO2



- b Draw the mechanical network and write the differential equation for the system in Fig 3.a. Draw the electrical network based on Force voltage and Force current analogy.

10

L3 CO1



- c What is block diagram representation. Derive the transfer function of a closed loop system.

6

L2 CO1

#### OR

- 4 a Define signal flow graph and list the properties of the signal flow graph.

7

L2 CO2

- b The performance equations of a controlled system are given by the following set of linear algebraic equations. Draw the block diagram and determine  $C(s)/R(s)$ .  
 $E1(s)=R(s)-H3(s)C(s)$ ,  $E2(s)=E1(s)-H1(s)E4(s)$ ,  $E3(s)=G1(s)E2(s)-H2(s)C(s)$ ,  
 $E4(s)=G2(s)E3(s)$ ,  $C(s)=G3(s)E4(s)$ .

10

L3 CO2

- c For the rotational system shown in figure, Draw the electrical network based on T-I analogy.

8

L3 CO1

