Name:.....
Roll No:.....

MAR ATHANASIUS COLLEGE OF ENGINEERING
KOTHAMANGALAM – 686666
(Govt. Aided Autonomous Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B. TECH FIRST SERIES EXAMINATION, AUGUST 2026

(S5 ECE A &B) B24EC3T02 CONTROL SYSTEMS

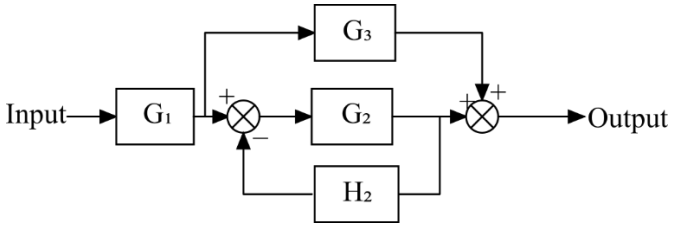
Max. Marks: 40 Duration: 1.5 Hours

PART A

Answer all questions. Each question carries 3 marks.

1. Write the force-voltage analogous electrical components for mass, dashpot and spring. (CO1)

2. Determine the transfer function using block diagram reduction techniques (CO1)



3. For a second order system, $\frac{C(s)}{R(s)} = \frac{100}{s^2+10s+100}$. Compute rise time, peak time and peak overshoot. (CO2)

4. Define steady state error and derive its expression for a unity feedback system. (CO2)

PART B

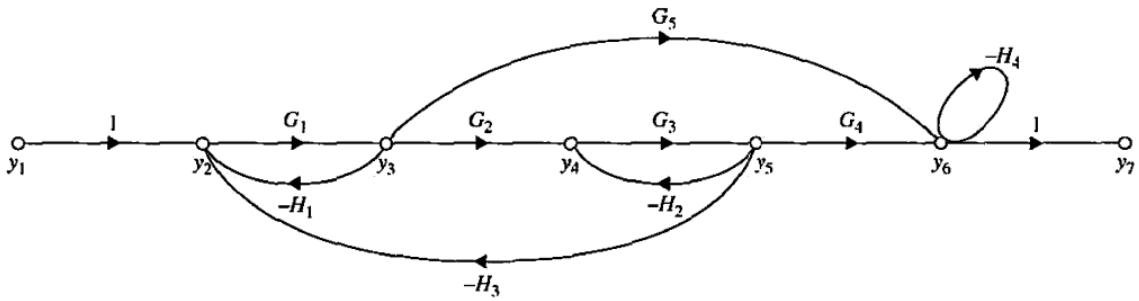
Answer all questions. Each question carries 14 marks.

5. a. For the given signal flow graph, find y_7/y_1. (CO1)

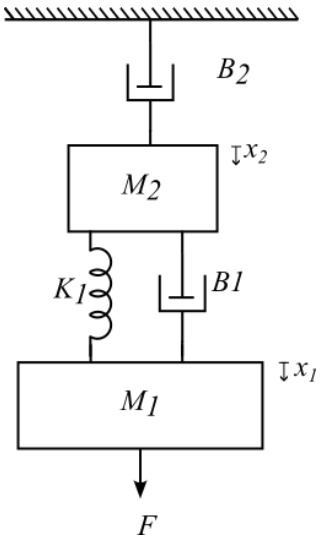
VISION
Embedding Creativity and fostering quality Education
MISSION
Advance the field of Electronics and Communication by developing and disseminating innovative practices and technologies.

Nurture technically competent professionals in Electronics and Communication Engineering equipped with the skills to address global challenges.

Foster socially responsible technocrats and entrepreneurs who contribute positively to society through their expertise and leadership.



b. Find the transfer function $X_1(s)/F(s)$ (CO1)



6. a. Derive the unit step response of an underdamped second order system. Sketch the response and mark the time domain specifications. (CO2)

b. For a unity feedback system, find the static error constants and steady state error when the input to the system is $r(t) = 1 - 3t + 4t^2$ (CO2)

$$G(s) = \frac{10(s+1)}{5s^2(s+10)(s+3)}$$

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