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

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

B. TECH SECOND SERIES EXAMINATION, OCTOBER 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. Draw a rough magnitude plot for $G(s) = \frac{1}{1+5s}$ and indicate corner frequency and slope. (CO4)

2. Determine whether s = -4 is a part of root locus for $G(s) = \frac{k}{s(s+1)(s+3)}$. (CO3)

3. Construct the Routh table and comment on system stability for the characteristic equation $s^4 + s^3 + s^2 + s + 1 = 0$ (CO3)

4. Define gain margin and phase margin of a system and discuss its significance on system stability. (CO4)

PART B

Answer all questions. Each question carries 14 marks.

5. a. Construct Routh array and find the system stability if characteristic equation is $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5 = 0$. Also comment on the location of closed loop poles. (CO3)

   b. Sketch the root locus for the open loop transfer function given by $G(s)H(s) = \frac{k}{(S+1)(S+2)(S+3)}$. Comment on the range of k for stability. (CO3)

6. Sketch the bode plot for $G(s) = \frac{5s^2}{(s+1)(s+10)}$ and determine the phase margin. (CO4)

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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.