TECHNICAL UNIVERSITY OF KENYA
BACHELOR OF ENGINEERING IN ELECTRICAL & ELECTRONICS ENGINEERING
CAT TWO: EEEQ461 CONTROL SYSTEMS ENGINEERING A

DATE: JULY 2018   **DATE DUE:26TH JULY 2018**

INSTRUCTIONS

1. Attempt all questions.
2. All workings must be clearly shown.

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a) Assume the system below, G(s), is in unity negative feedback. Determine the value of K such that the steady state error to a step response is 1/11. Also determine the percent overshoot and settling time of the feedback system at this K. **[6 marks].**

$$G(s) = \frac{K}{(s+5)(s+5)}$$

b) Determine whether the unity feedback system shown below is stable if **[7 Marks].**

$$G(s) = \frac{240}{S^4 + 10s^3 + 35s^2 + 50s + 264}$$

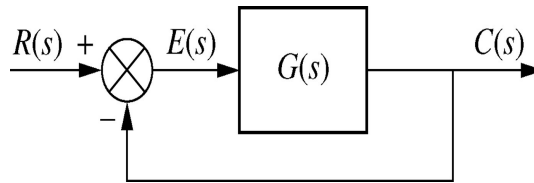c) For the unity feedback system shown in figure Q1 (c) below, where **[7 Marks].**

Figure Q1(c)

$$G(s) = \frac{5000}{s(s+75)}$$

    i.   What is the expected percent overshoot for a unit step input?
    ii.   What is the settling time for a unit step input?
    iii.   What is the steady-state error for an input of 5u (t)?

** END OF CAT TWO **