TECHNICAL UNIVERSITY OF KENYA
BACHELOR OF ENGINEERING IN ELECTRICAL & ELECTRONICS ENGINEERING
ASSIGNMENT: 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.

a) For the system shown below (Figure(a), do the following:
    i.   Find the transfer function $G(s) = X(s) = F(s)$. **[2 Marks].**
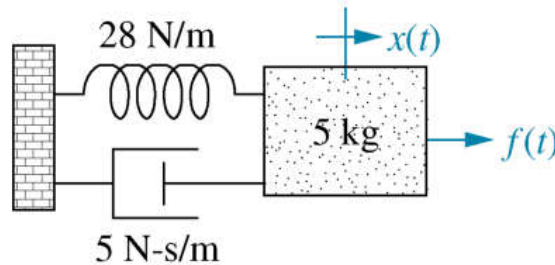   ii.   Find ζ, Wn, % OS, Ts, Tp and Tr. **[5 marks].**

Figure (a)

b) For the unit step response shown below, find the transfer function of the system of Figure (b) **[7 Marks].**
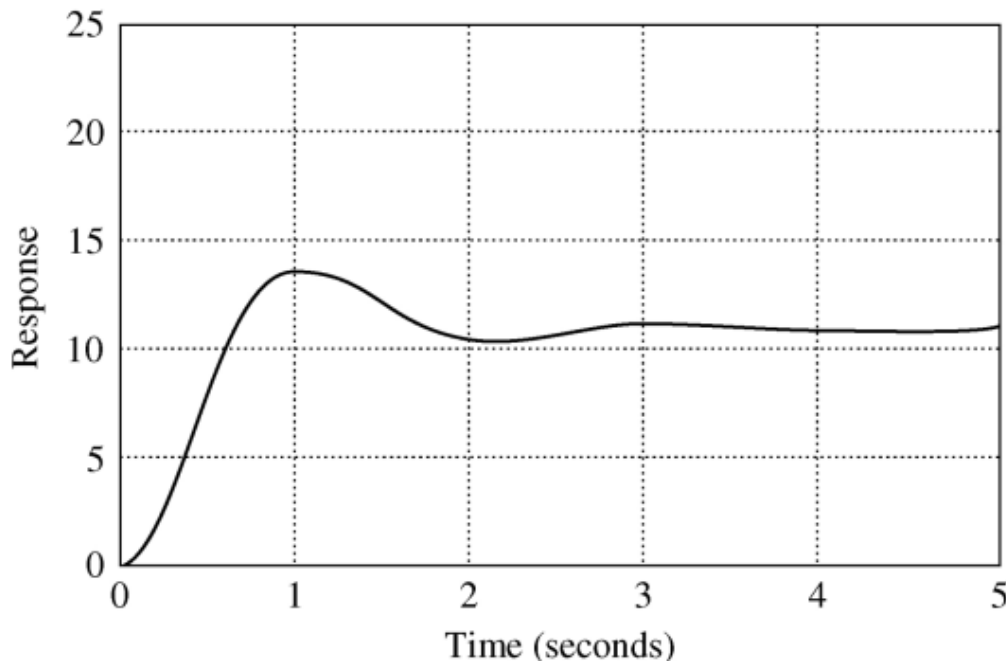

Figure (b)

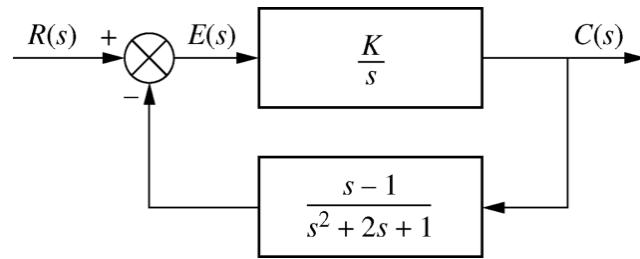c) Find the range of K to keep the system shown below(Figure (c)) stable**[6 Marks]**;

$$R(s) \xrightarrow{+} \bigotimes \xrightarrow{E(s)} \boxed{\dfrac{K}{s}} \xrightarrow{C(s)}$$

Forward block: $\dfrac{K}{s}$

Feedback block: $\dfrac{s-1}{s^2 + 2s + 1}$

Figure (c)