Mohit Garg

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- Oct 2017

B. Tech Vth Semester

COURSE CODE: 10B1WEC515 MAX. MARKS: 25

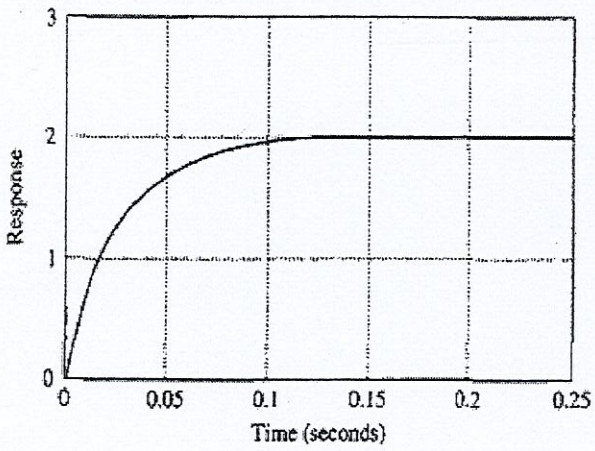
COURSE NAME: **Theory and Application of Control Systems**

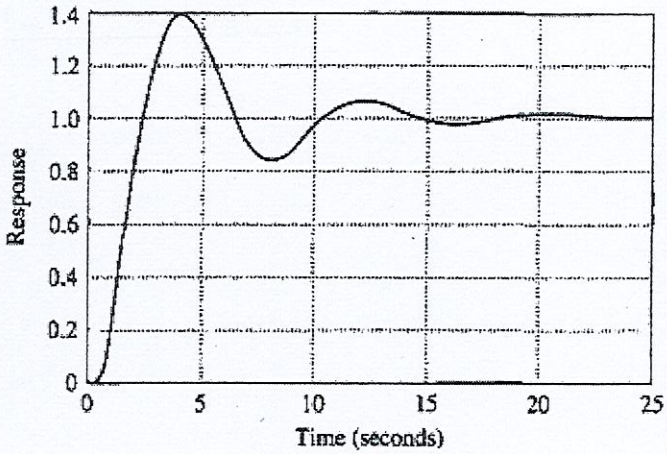
COURSE CREDITS: 4 MAX. TIME: 1hr 30 min

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

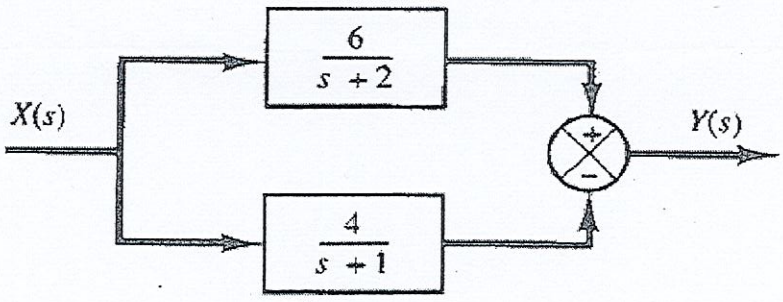
---

1. **[5 marks] For each of the unit step responses shown in below figures, find the transfer function of the system.**





2. **[5 marks] Consider the system shown below. Show that the transfer function Y(s)/X(s) has a zero in the right-half of s-plane. Then obtain y(t) when x(t) is a unit step. Plot y(t) versus t.**



3. **[1 mark each] Write Short Notes on:**

a) Transfer function b) Type and Order of the system c) Dominant poles
d) Conditional stability e) BIBO stability

4. [6 marks] Draw the root locus of the given transfer function and determine the range of K for the system to be stable.

$$G(s)=\frac{K(s+1)}{s(s+2)(s+3)^2},\quad H(s)=1$$

5. [4 marks] Find the positive values of "K" and "a" so that the unity negative feedback system shown in figure below oscillates at a frequency of 2 rad/sec.