BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI

I Semester 2007-08

AAOC C321 Control System

Online Test (Closed Book) Duration: 50 Min

Max. Marks: 20

B

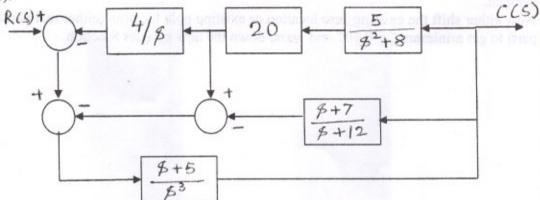
Date: 04.11.2007

ID No .:

Tut Sec. No .:

Name:

- Note: 1. Write all the necessary MATLAB instructions, you are using to obtain the answer.
 - 2. Weightage for MATLAB instructions is 60% and for correct answers is 40%
 - 3. No credit is assigned to any plots/sketches.
- Reduce the given block diagram using MATLAB instructions and obtain the transfer function C(s)/R(s).



Q.2 For the system whose open loop transfer function is $\frac{K(S+2)}{(S^2+2S+4)}$

(A) Draw the root locus. Determine the minimum value of ζ and value of K when system is critically damped.

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(B) Now either shift the existing zero location or existing pole location (either real part or imaginary part) to get minimum $\zeta = 0.707$ and write down the new transfer function.

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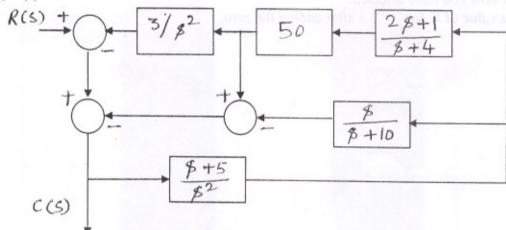
Name:

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Tut Sec. No.:

A

- Note: 1. Write all the necessary MATLAB instructions, you are using to obtain the answer.
 - 2. Weightage for MATLAB instructions is 60% and for correct answers is 40%
 - 3. No credit is assigned to any plots/sketches.
- Reduce the given block diagram using MATLAB instructions and obtain the transfer function Q.1 C(s)/R(s).



Q.2 For the system whose open loop transfer function is $\frac{K}{S(S^2 + 2S + 2)}$

(A) From the root locus determine the range of K for stability.

(B) Add a zero (between -1.5 to -3.5) so that range of K is increased five times than in (A). Write the location of zero you have selected.

(C) What is the value of K for $\zeta = 0.3$ after adding the zero.