

Date: 04.11.2007

Max. Marks: 20

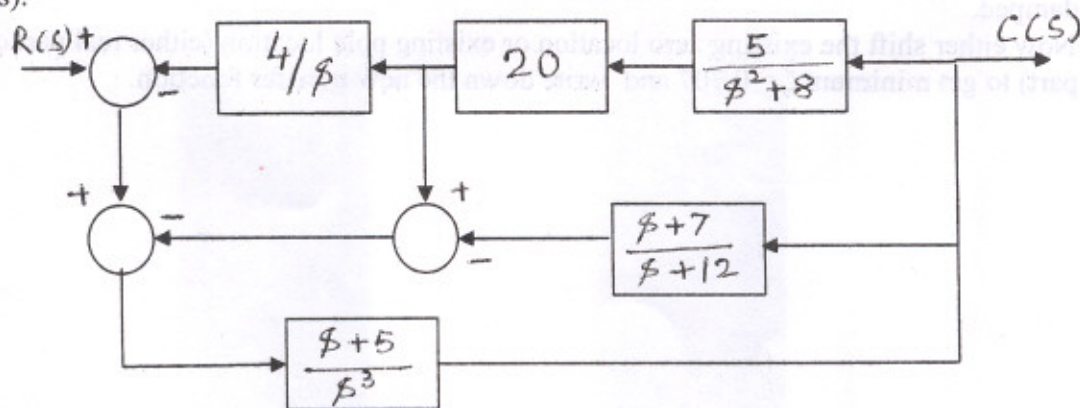
Name:

ID No.:

Tut Sec. No.:

- 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.

Q.1 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.
- (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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Duration: 50 Min

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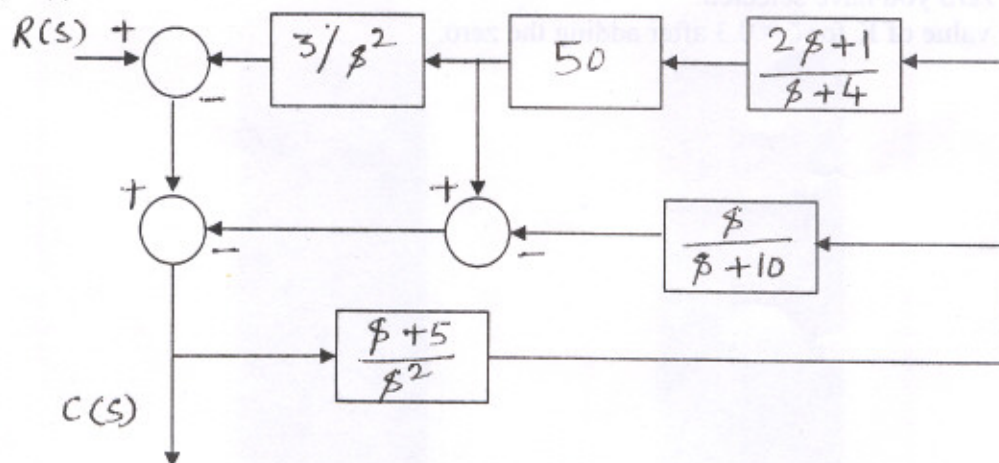
Name:

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Q.1 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 $\frac{K}{S(S^2 + 2S + 2)}$

- (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.