Dr. Salman Raju

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-1 EXAMINATION – February 2020

B.Tech VI Semester (E.C.E)

COURSE CODE: 18B1WEC531

COURSE NAME: Control Systems MAX. MARKS: 15

COURSE CREDITS: 3 MAX. TIME: 1HRS

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

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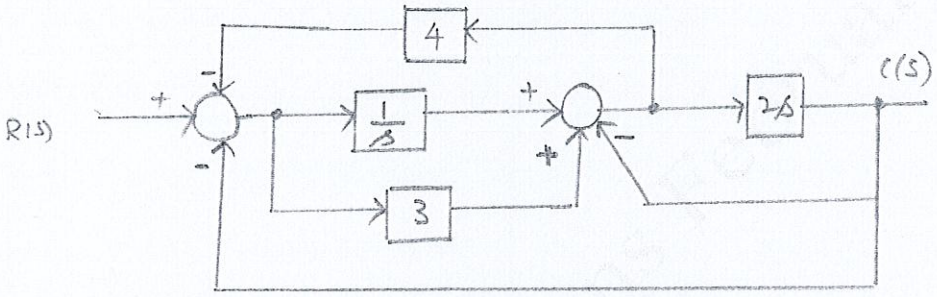
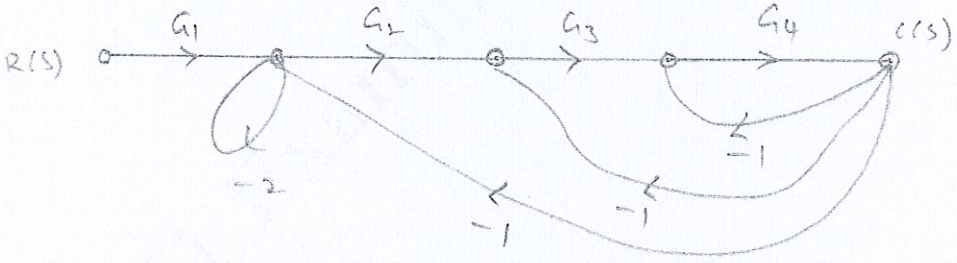
1. Find the poles of the closed-loop transfer function $\frac{C(s)}{R(s)}$ by using block diagram reduction rules. (3)



2. Using Mason's rule, find the transfer function $\frac{C(s)}{R(s)}$ for the system represented below. (4)



3. Find the rise time, time constant and 5% percent settling time for the unit step response of the system , if system transfer function is $G(s) = \frac{s+1}{s+2}$. (4)

4. For each pair of second order system specifications that follow, find the location of the second order pair of poles.

(4)

   a. Percent over shoot is 12% and Settling time(2% criterion) is 0.2 seconds
   b. Settling time (2% criterion) is 7 seconds and first peak time is 2 seconds.