POORNIMA COLLEGE OF ENGINEERING

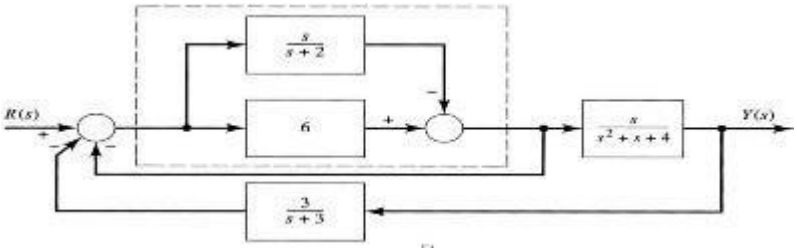
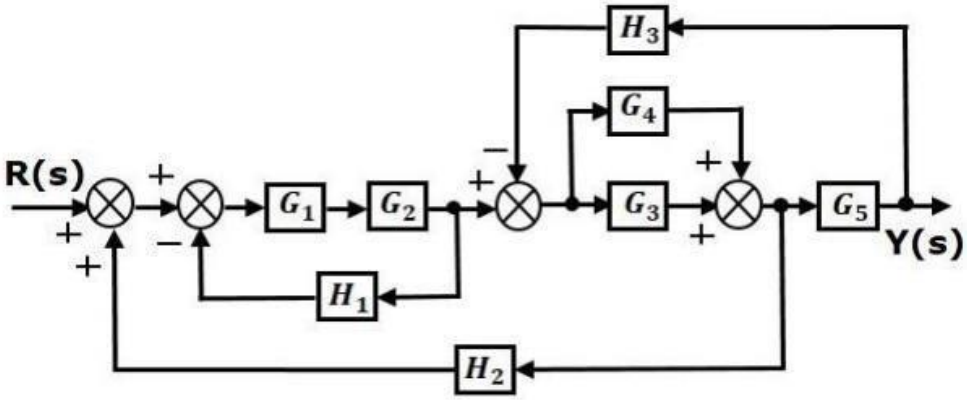
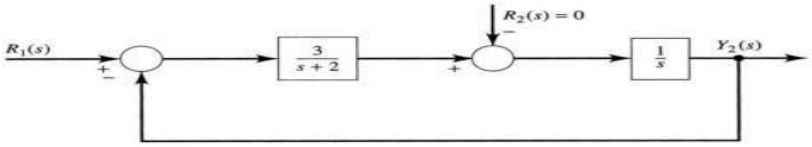
Department of Electronics & Communication Engineering

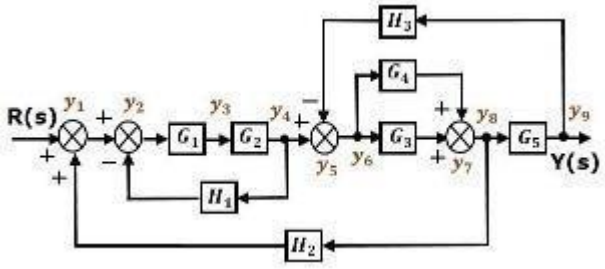
Assignment

Campus: PCE **Course: B. Tech.** **Class/Section: V Sem.** **Date: 21/11/23**

Name of Faculty: Dr. Meetu Nag **Name of Subject: Control System** **Code: 5EC4-03**

M.M. 10

1.	CO1	PO1,2,3	Q.1 Determine the transfer function.  (2)
2.	CO1	PO1,2	Q2.Consider the block diagram shown in the following figure. Let us simplify (reduce)this block diagram using the block diagram reduction rules.  (3)
3.	CO1	PO1,2	Q 3.Determine the transfer function Y2(s)/R1(s).  (3)
4.	CO1	PO1,2	Q4.Convert block diagram to signal flow graph

			 H_3 G_4 R(s) y_1 y_2 y_3 y_4 y_5 y_6 y_7 y_8 y_9 G_1 G_2 G_3 G_5 Y(s) H_4 H_2 (2)

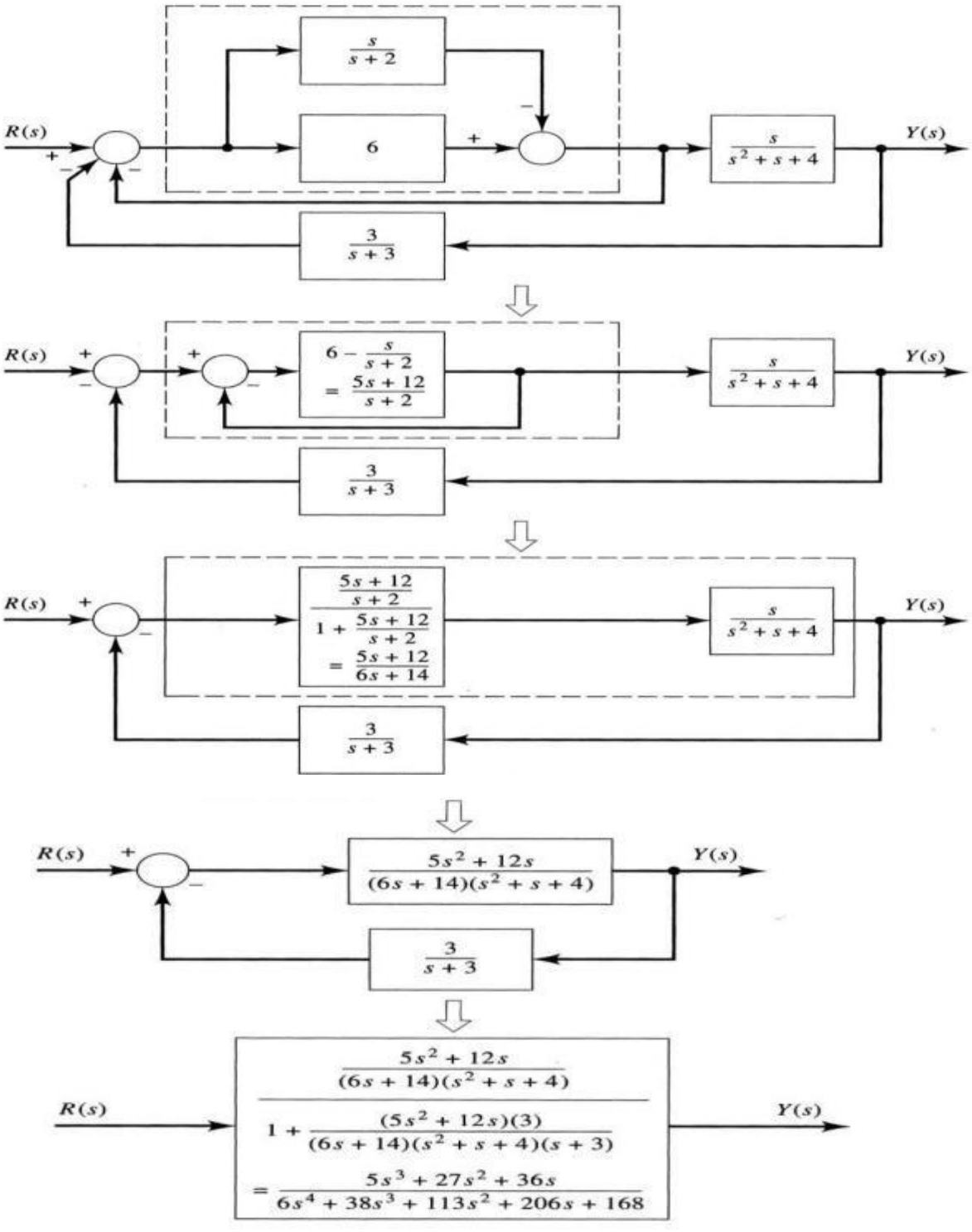
POORNIMA
COLLEGE OF ENGINEERING

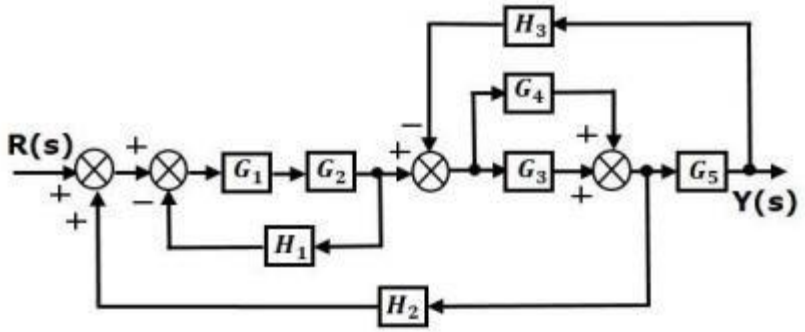
Solutions

Campus: PCE **Course: B.Tech.** **Class/Section: V Sem.** **Date: 21/11/23**

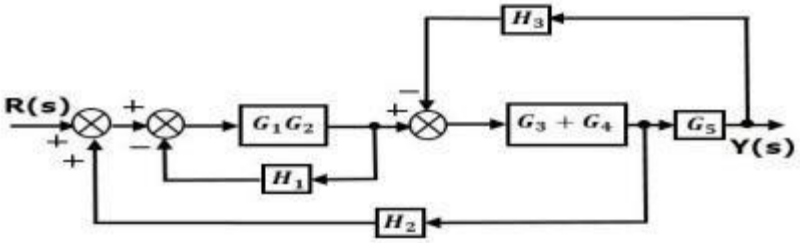
Name of Faculty: Dr. Meetu Nag **Name of Subject: Control System** **Code: 5EC4-03**

Ans 1

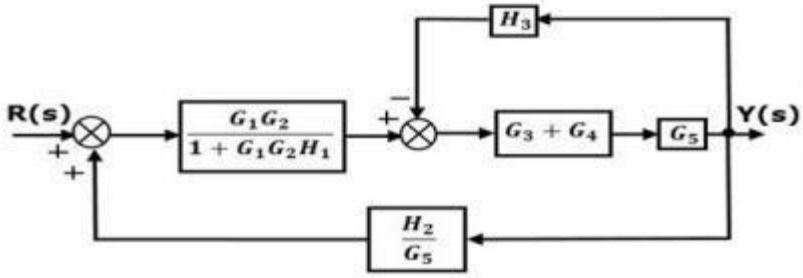




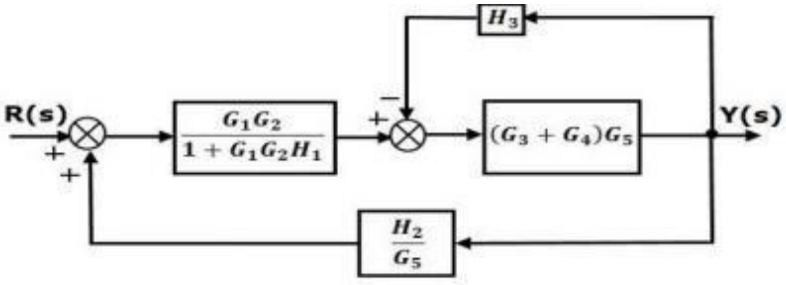
Step 1 – Use Rule 1 for blocks G_1 and G_2. Use Rule 2 for blocks G_3 and G_4. The modified block diagram is shown in the following figure.



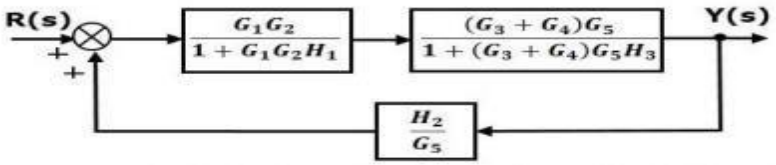
Step 2 – Use Rule 3 for blocks G_1G_2 and H_1. Use Rule 4 for shifting take-off point after the block G_5. The modified block diagram is shown in the following figure.



Step 3 – Use Rule 1 for blocks $(G_3 + G_4)$ and G_5. The modified block diagram is shown in the following figure.

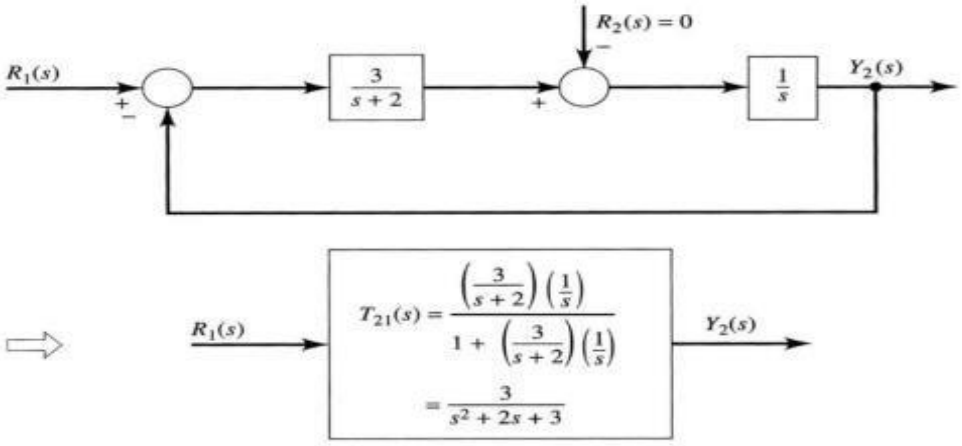


Step 4 – Use Rule 3 for blocks $(G_3 + G_4)G_5$ and H_3. The modified block diagram is shown in the following figure.

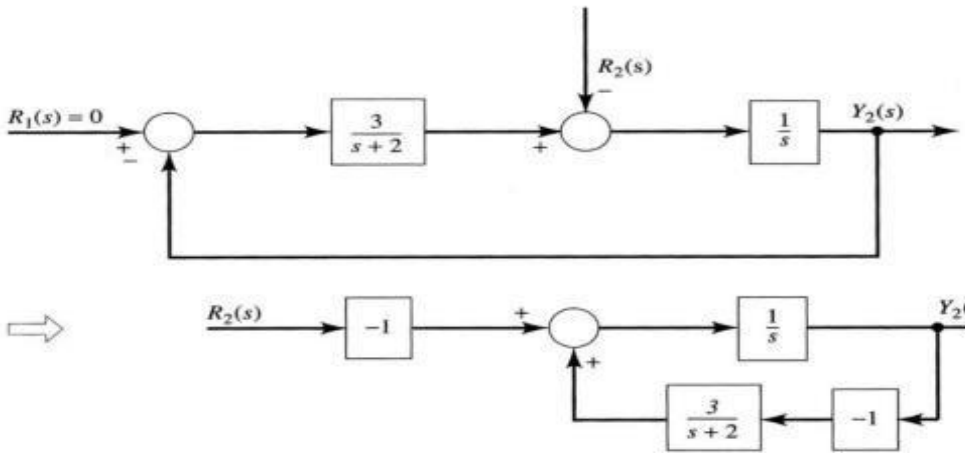


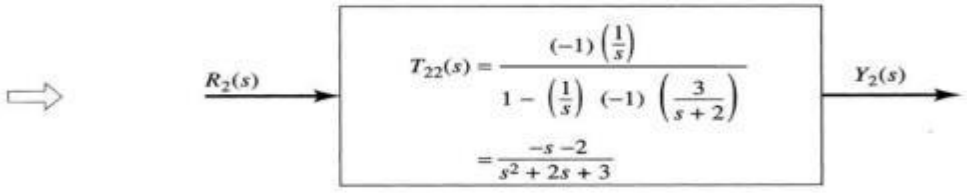
Step 5 – Use Rule 1 for blocks connected in series. The modified block diagram is shown in the following figure.

Q 1



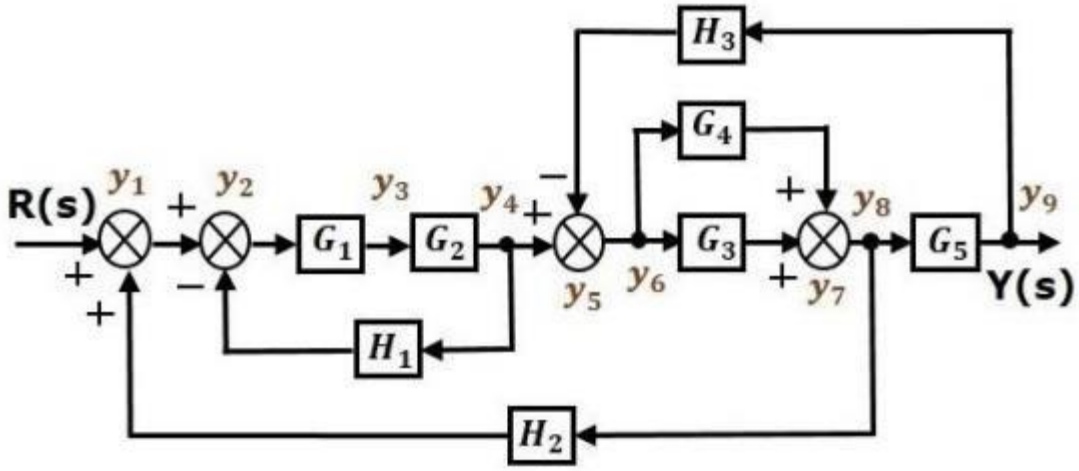
(*a*)

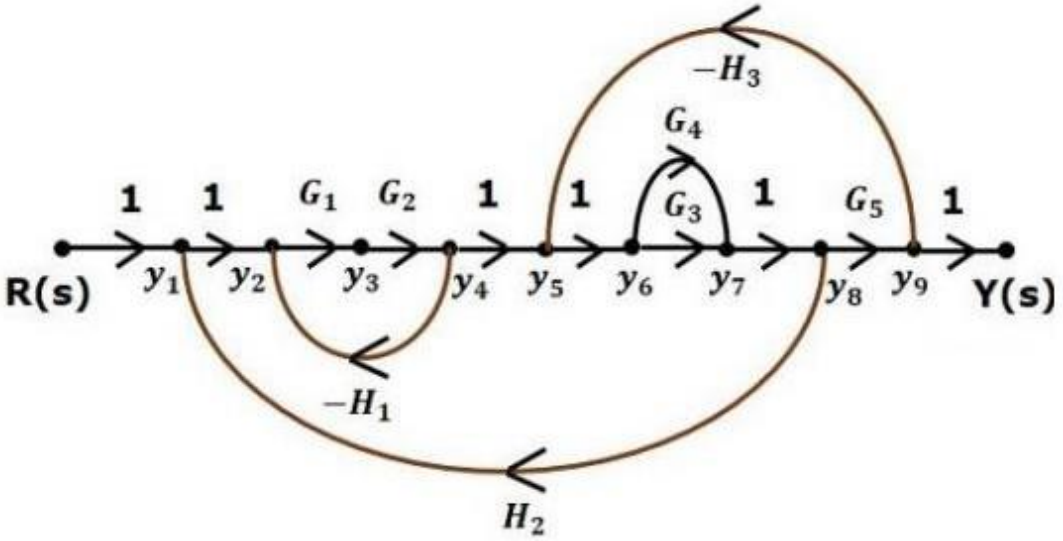




(*b*)

Q2.


H_3
G_4
R(s)
y_1
y_2
y_3
y_4
y_8
y_9
G_1
G_2
G_3
G_5
Y(s)
y_5
y_6
y_7
H_1
H_2


$-H_3$
G_4
1
1
G_1
G_2
1
1
G_3
1
G_5
1
R(s)
y_1
y_2
y_3
y_4
y_5
y_6
y_7
y_8
y_9
Y(s)
$-H_1$
H_2