

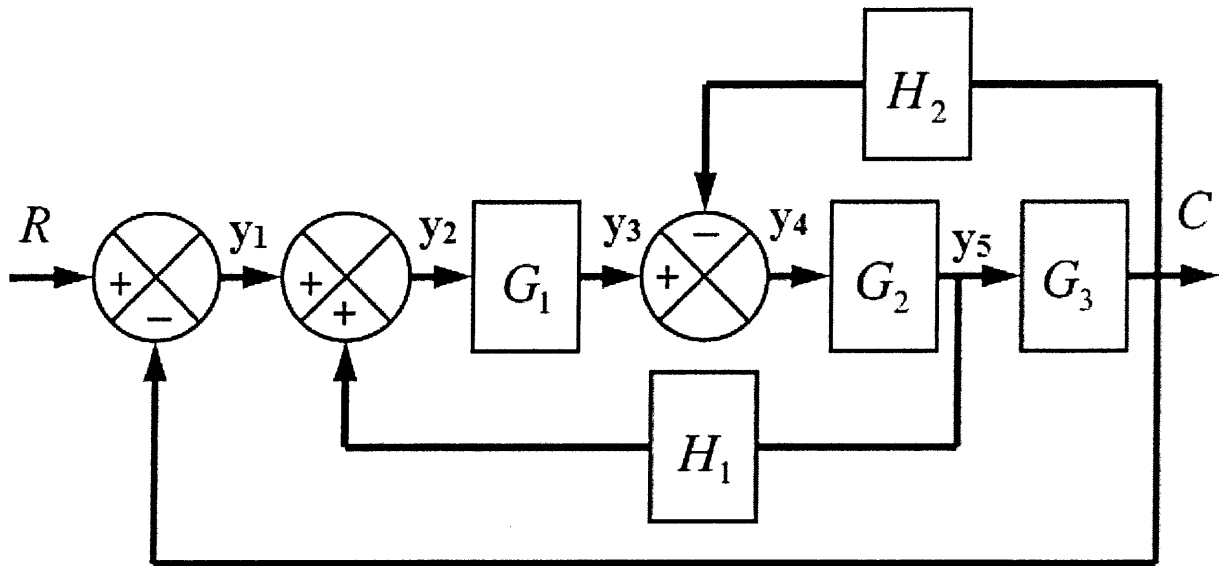
Typical:-

|                                 |                         |                               |
|---------------------------------|-------------------------|-------------------------------|
| Faculty of Engineering          | Philadelphia University | Mechanical Eng. Dep.          |
| Course name: Automatic control  | First Quiz              | Course number:620443 class(1) |
| Instructor: Eng. Laith Batarseh | Sunday 4/11/2018        | Allowed time: 10 minutes      |

Student Name:

Student ID number:

Problem: derive the governing equations for  $y_1, y_2, y_3, y_4, y_5$  and  $C$  from the following diagram



$$Y_1 = R - C$$

$$Y_2 = Y_1 + H_1 Y_5$$

$$Y_3 = G_1 Y_2$$

$$Y_4 = Y_3 - H_2 C$$

$$Y_5 = G_2 Y_4$$

$$C = G_3 Y_5$$

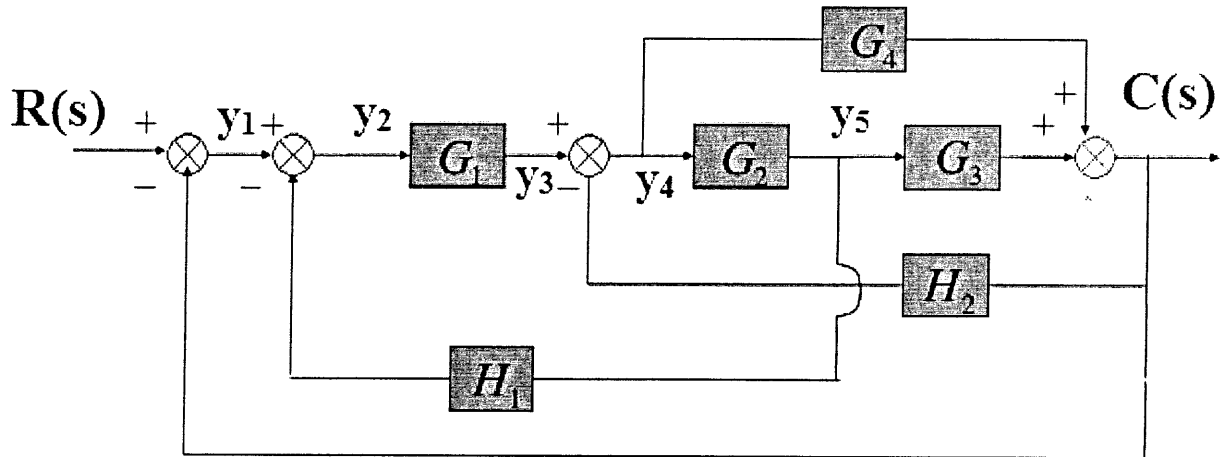
Typical

|                                 |                         |                                |
|---------------------------------|-------------------------|--------------------------------|
| Faculty of Engineering          | Philadelphia University | Mechanical Eng. Dep.           |
| Course name: Automatic control  | First Quiz              | Course number: 620443 class(1) |
| Instructor: Eng. Laith Batarseh | Sunday 4/11/2018        | Allowed time: 10 minutes       |

Student Name:

Student ID number:

Problem: derive the governing equations for  $y_1, y_2, y_3, y_4, y_5$  and  $C$  from the following diagram



$$Y_1 = R - C$$

$$Y_2 = Y_1 - H_1 Y_5$$

$$Y_3 = G_1 Y_2$$

$$Y_4 = Y_3 - H_2 C$$

$$Y_5 = G_2 Y_4$$

$$C = G_3 Y_5 + G_4 Y_4$$