BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)
B.Tech.Sem - IV R&A :SUMMER- 2022
SUBJECT : AUTOMATIC CONTROL SYSTEMS

Day : Friday
Date : 24-06-2022

S-24790-2022

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B. :

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of **CALCULATOR** is allowed.

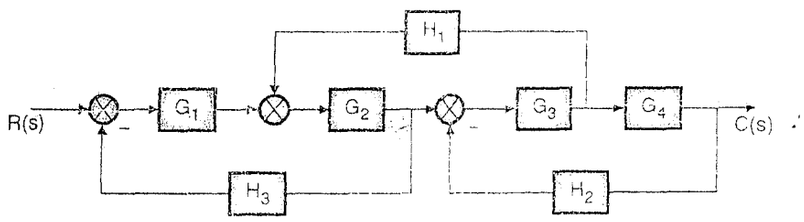
Q.1 Suggest a control system for the following applications and prepare a block diagram **(10)**

a) Automatic Washing Machine
b) Automatic Electric Irons

OR

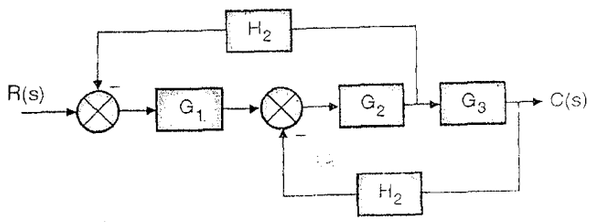
Q.1 Draw a block diagram of mechatronics system and explain each component involved in it. Also state examples of mechatronics system. **(10)**

Q.2 Determine $\frac{C(s)}{R(s)}$ using block diagram reduction techniques. **(10)**



OR

Q.2 Using block diagram reduction method, obtain the transfer function of the given system. **(10)**



Q.3 State and explain the standard test signals used to evaluate the performance of control system. **(10)**

OR

Q.3 For a second order system a resonance peak of amplitude 2 units at a resonance frequency of 3 rad/sec. Determine peak over shoot, peak time, settling time and rise time. **(10)**

Q.4 Discuss stability of the following system using Routh-Hurwitz criteria **(10)**

$$G(s) = \frac{100}{s^4 + 6s^3 + 30s^2 + 60s + 100}$$

OR

P.T.O

Q.4 Investigate F(s) for stability using Routh criteria **(10)**

a) $F(s) = s^4 + s^3 + 3s^2 + 6s + 6$

b) $F(s) = s^5 + s^4 + 2s^3 + 6s + 6$

Q.5 Explain PID controller in detail and state its industrial applications. **(10)**

OR

Q.5 Compare proportional, integral and derivative controller with response plots. **(10)**

Q.6 Classify switches and draw the symbol for **(10)**

a) SPST **b)** SPDT **c)** DPDT **d)** limit switch **e)** pressure switch

OR

Q.6 Write a brief note on : **(10)**

a) SAR type ADC

b) Relays and its applications with relay logic diagram

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