BACHELOR OF TECHNOLOGY (C.B.C.S.) (2014 COURSE)
B.Tech.Sem - VII MECHANICAL : : SUMMER - 2022
SUBJECT : AUTOMATIC CONTROL SYSTEM

Day : Tuesday
Date : 31-05-2022

S-13458-2022

Time : 02:30 PM-05:30 PM
Max. Marks : 60

N.B.:

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labeled diagram **WHERVER** necessary.
4) Assume suitable data if necessary.

Q.1 Consider the polynomial $S^5+3S^4+2S^3+6S^2+6S+9$ comment on stability. **(10)**

OR

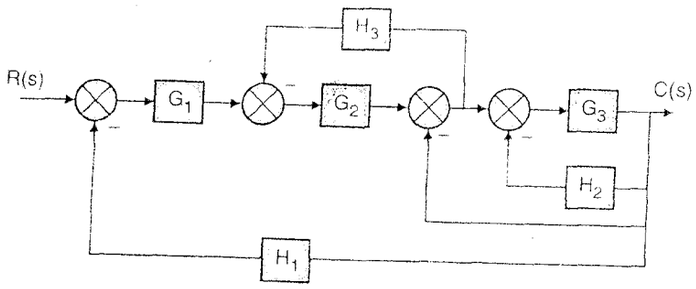
Q.1 Find the range of 'K' for stability and also find K_{max} and W_{max}. **(10)**

$$G(5)=\frac{K}{S(1+0.4S)(1+0.25S)}$$

Q.2 What is block diagram? Explain any four rules used in block diagram reduction in control system application. **(10)**

OR

Q.2 Find transfer function using block diagram reduction rules. **(10)**



Q.3 Explain the concept of state, state variable, state vector, state space and state model. **(10)**

OR

Q.3 What is system response? Derive the expression representing the O/P response of a first order system with signal as given below: **(10)**
i) Step input ii) Ramp input.

Q.4 Explain different types of A to D conversion techniques. Compare their characteristics namely accuracy, conversion time/ speed. Discuss any one technique in detail. **(10)**

OR

Q.4 What is operational amplifier? Explain any one application in detail. **(10)**

Q.5 Explain with a diagram of working principle of PID control used in machine tools. **(10)**

OR

Q.5 What is open and closed loop control system? Explain concept of mechatronics and its applications. **(10)**

Q.6 Explain PLC program with a ladder diagram for fluid power circuits. **(10)**

OR

Q.6 What is PLC? How PLC are programmed? Give suitable example. **(10)**

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