O.P.Code: 20EE0214	R20	H.T.No.									

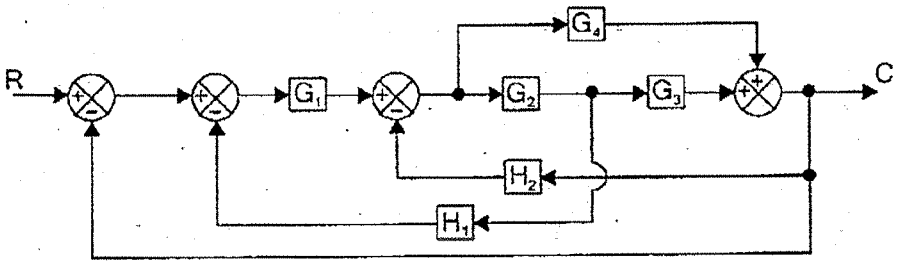
SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Regular & Supplementary Examinations June-2024
CONTROL SYSTEMS
(Electronics and Communication Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		Using Block diagram reduction technique find the Transfer Function of the system.	**CO2**	**L4**	**12M**



OR

2	**a**	Give the block diagram reduction rules to find the transfer function of the System.	**CO1**	**L2**	**6M**
	b	List the properties of signal flow graph.	**CO1**	**L2**	**6M**

UNIT-II

3		Define steady state error. Derive the static error components for Type 0, Type 1 &Type 2 systems.	**CO3**	**L2**	**12M**

OR

4		A positional control system with velocity feedback shown in fig. What is the response c(t) of the system for unit step input?	**CO3**	**L4**	**12M**

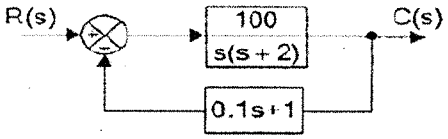


Fig 1 : Positional control system.

UNIT-III

5		Explain the procedure for constructing root locus.	**CO5**	**L2**	**12M**

OR

6		Develop the root locus of the system whose open loop transfer function is	**CO5**	**L4**	**12M**

$$G(s) = \frac{K}{S\,(S^2+4S+13)}$$

UNIT-IV

7	a	Determine the transfer function of Lag Compensator and draw pole-zero plot.	CO4	L3	6M
	b	Determine the transfer function of Lead Compensator and draw pole-zero plot.	CO4	L3	6M

OR

8		Develop the Bode plot for the system having the following transfer function and determine phase margin and gain margin. $$G(s) = \frac{75(1+0.2S)}{S(S^2+16S+100)}$$	CO4	L3	12M

UNIT-V

9	a	Define state, state variable, state equation.	CO2	L1	6M
	b	Derive the expression for the transfer function from the state model. $\dot{X} = Ax + Bu$ and $y = Cx + Du$	CO2	L2	6M

OR

10		Determine the Solution for Homogeneous and Non homogeneous State equations.	CO6	L3	12M

***** END *****