O.P.Code: 19EE0212	R19	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Supplementary Examinations June-2024
CONTROL SYSTEMS
(Common to EEE & ECE)

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

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

UNIT-I

1	a	Compare open loop and closed loop control systems based on different aspects.	L4	CO1	8M
	b	Distinguish between Block diagram Reduction Technique and Signal Flow Graph.	L4	CO1	4M

OR

2		Find the overall transfer function of the system whose signal flow graph is shown below.	L1	CO1	12M

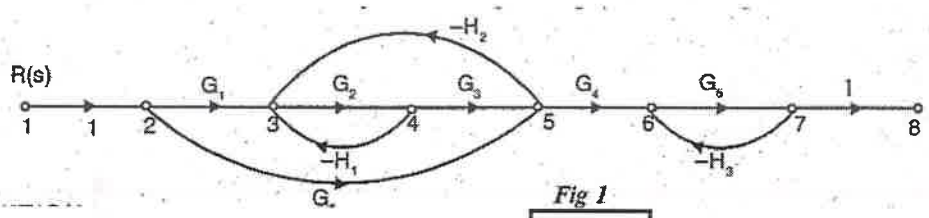


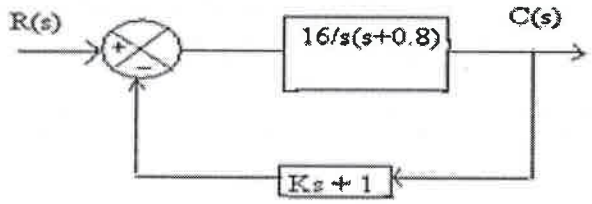
Fig 1

UNIT-II

3		List out the time domain specifications and derive the expressions for Rise time, Peak time and Peak overshoot.	L1	CO2	12M

OR

4		A positional control system with velocity feedback shown in figure. What is the response c(t) to the unit step input. Given that damping ratio=0.5.Also determine rise time, peak time, maximum overshoot and settling time.	L5	CO2	12M



UNIT-III

5		With the help of Routh's stability criterion find the stability of the following systems represented by the characteristic equations. (a) **s4 + 8 s3 + 18 s2 + 16s + 5 = 0.** (b) **s6 + 2s5 + 8s4 + 12s3 + 20s2 + 16s + 16 = 0.**	L1	CO3	12M

OR

6		Explain the procedure for constructing root locus.	L2	CO3	12M

UNIT-IV

7		Derive the expressions for resonant peak and resonant frequency and hence establish the correlation between time response and frequency response.	L3	CO4	12M

OR

8	a	Define and derive the expression for resonant frequency.	L1	CO4	6M
	b	Given **ξ = 0.7** and **ωn = 10 rad/sec.** Find resonant peak, resonant frequency and bandwidth.	L5	CO4	6M

UNIT-V

9		Determine the Solution for Homogeneous and Non homogeneous State equations.	L5	CO5	12M

OR

10	a	Define state, state variable, state equation	L1	CO5	6M
	b	Derive the expression for the transfer function from the state model.	L3	CO5	6M

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$\dot{X} = Ax + Bu$ and $y = Cx + Du$

***** END *****