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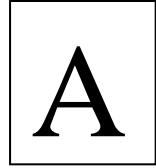


SNS College of Technology, Coimbatore-35.
(Autonomous)

B.E/B.Tech Internal Assessment - II
Academic Year 2022-2023(Odd)

Third Semester

Electronics and Communication Engineering
19ECT202 – SIGNALS AND SYSTEMS



Time: 1^{1/2} Hours

Maximum Marks: 50

Answer All Questions

PART - A (5 x 2 = 10 Marks)

			CO	Blooms	
1.		Find the Laplace transform of unit step function.	CO2	App	
2.		Determine the Laplace transform of $x(t) = e^{at} u(t)$.	CO2	Ana	
3.		List the properties of convolution Integral with suitable expressions.	CO3	Rem	
4.		What is meant by system transfer function and impulse response?	CO3	Rem	
5.		Relate the condition for an LTI system to be causal and stable.	CO3	Und	
PART – B (2 x 13 = 26 Marks)					
			CO	Blooms	
6.	(a)	(i) Find the Laplace transform of $x(t) = e^{-at} \cos \omega t u(t)$.	7	CO1	Und
		(ii) Find the inverse Laplace transform of $X(S) = 4 / (S+2)(S+4)$ and find the ROC: (i) $-2 > \text{Re}(s) > -4$ (ii) $\text{Re}(s) < -4$	6		
		(or)			
	(b)	(i) Find the Laplace transform of $x(t) = \text{Sinhat } u(t)$	7	CO1	App
		(ii) Find the inverse Laplace transform of $X(S) = S^2 / S(S+2)(S-3)$ using Partial Fraction Method.	6		
7.	(a)	Obtain Direct form I and Direct form II realization for the given function: $H(S) = (S^2 + 4S + 2) / (S^2 + 5S + 2)$	13	CO2	Ana

		(or)			
	(b)	(i) A system is described by the differential equation $\frac{d}{dt}y(t)+5y(t)=x(t)$ with initial conditions as $y(0^-)=-2$ and input $x(t)=3e^{-2t}u(t)$.	7	CO3	App
		(ii) Find the system transfer function and Impulse response described by the differential equation: $(\frac{d^2}{dt^2})y(t)+3(\frac{d}{dt})y(t)+2y(t)=x(t)$	6		
PART – C (1 x 14 = 14 Marks)					
				CO	Blooms
8.	(a)	(i) The input output relation of a system at initial rest is given by $\frac{d^2}{dt^2}y(t) + 4 \frac{d}{dt}y(t) + 3y(t) = \frac{d}{dt}x(t) + 2x(t)$. Find the system transfer function, Frequency and Impulse response.	7	CO3	App
		(ii) $H(s)=\frac{S}{S^2+5S+6}$ and $x(t)=e^{-t}u(t)$. Determine the output by assuming zero initial condition.	7		
		(or)			
	(b)	A system is described by the differential equation $\frac{d^2}{dt^2}y(t) + 7\frac{d}{dt}y(t) + 12y(t) = x(t)$. Using Laplace transform determine the response of the system to the unit step signal. Assume the initial conditions as $y(0^-) = -2, y'(0^-)=0$.	14	CO3	Ana

Abbreviations:

CO – Course Outcomes; **Rem**- Remembering; **Und** – Understanding; **App** – Applying; **Ana** – Analyzing; **Eva** – Evaluating; **Cre**- Creating