CODE No.: 19BT30203 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

SIGNALS AND NETWORKS

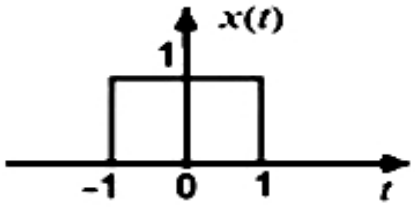
[Electrical and Electronics Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Illustrate whether the following signals are periodic or aperiodic. If the signal is periodic find its fundamental period. i) $x(n) = 3\cos(10n + \pi/6)$ ii) $x(n) = e^{(j\pi n/2)}$	6 Marks	L3	CO1	PO2
	b)	Consider the following signal and sketch for the given $x(-2t+1)$.	6 Marks	L3	CO1	PO2

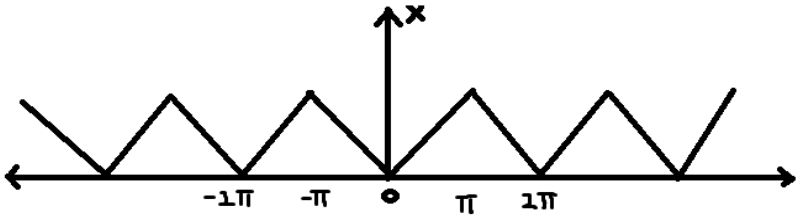


(OR)

2.	a)	Distinguish between Energy and Power signals.	4 Marks	L2	CO1	PO1
	b)	Determine and sketch $y(t) = x(t) + x(2-t)$ where $x(t) = u(t+2) - u(t-1)$. Express *y(t)* in terms of step functions.	8 Marks	L3	CO1	PO2

UNIT-II

3.	a)	State any four properties of fourier series .	4 Marks	L1	CO2	PO1
	b)	Find the fourier series expansion for the waveform shown in figure.	8 Marks	L3	CO2	PO2



The waveform is $x(t) = \begin{cases} -\frac{At}{\pi} & for\ -\pi \le t \le 0 \\ \frac{At}{\pi} & for\ 0 \le t \le \pi \end{cases}$

(OR)

4.	a)	Check the following signals $\cos n\omega_0 t$ *and* $\cos m\omega_0 t$ are Orthogonal or not.	4 Marks	L2	CO2	PO2
	b)	The given rectangular pulse is $x(t) = \begin{cases} 1, & \lvert t\rvert < T_1 \\ 0, & \lvert t\rvert < T_1 \end{cases}$. Find the fourier transform .	8 Marks	L3	CO2	PO2

UNIT-III

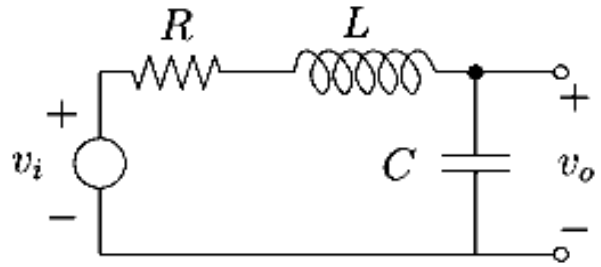
5.	a)	Find the Laplace transform and ROC of the signal $-e^{-at}u(-t)$.	6 Marks	L3	CO2	PO5
	b)	Find the inverse Laplace transform of the $X(s) = \frac{2s+1}{(s+1)(s^2+2s+2)}$.	6 Marks	L3	CO2	PO5

(OR)

6.	a)	Find the z- transform of $x[n] = (2)^n u[n] + \left(\frac{1}{3}\right)^{-n} u[-n]$.	6 Marks	L3	CO2	PO5
	b)	Determine the Inverse ZT, for the following ZT $X[z] = \frac{2-\frac{3}{2}z^{-1}}{1-\frac{3}{2}z^{-1}+\frac{1}{2}z^{-2}}$ *for ROC* $\lvert z\rvert > 1$.	6 Marks	L3	CO2	PO2

UNIT-IV

7.	a)	An electrical circuit shown below has $R = 1K\Omega$, $L = 1\mu H$, $C = 1\mu F$.	6 Marks	L3	CO3	PO2

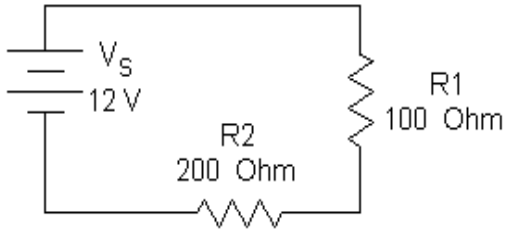


i) Find the system equation (ODE) which relates $v_i(t)$ *with* $v_0(t)$.
ii) Determine transfer function H(s).
iii) Draw magnitude response $\|H(j\omega)\|$.

	b)	A signal $v_i(t) = 10\cos(1000\pi t)$ *Volts* is applied to the circuit shown in 7(a). Comment whether the signal is passed or stopped by the circuit.	6 Marks	L3	CO3	PO5

(OR)

8.	a)	Differentiate RL and RC circuits	4 Marks	L2	CO3	PO1
	b)	For the electrical network shown below, answer the following	8 Marks	L3	CO3	PO2

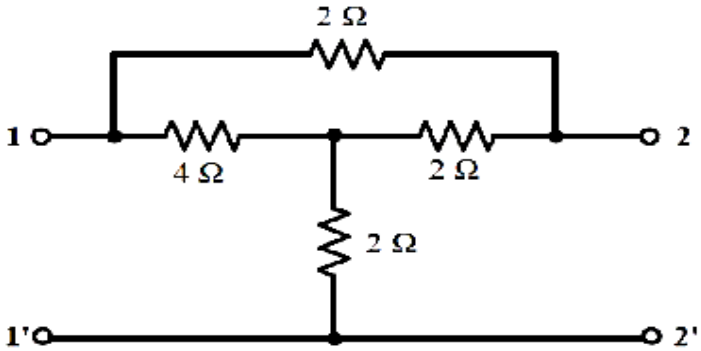


i) Find the impulse response function for this network.
ii) Determine the frequency response function.
iii) Sketch the magnitude and the phase response.

Assume that the output is taken across the 100ohm resistor.

UNIT-V

9.	a)	For the given 2-port network, find the value of transfer impedance z_{21} in ohms	6 Marks	L3	CO4	PO2



	b)	Write short notes on Z,Y,T and h parameters.	6 Marks	L2	CO4	PO1

(OR)

10.	a)	Write short notes on Transfer function and Driving point function.	6 Marks	L3	CO4	PO2
	b)	Explain transmission (ABCD) parameters in detail.	6 Marks	L1	CO4	PO1

❀ ❀ ❀