Total No. of Printed Pages: 03

PRN No.	

PAPER CODE	V213-292 (RE)

December 2023 (REEXAM)

SY B.TECH (SEMESTER - I)

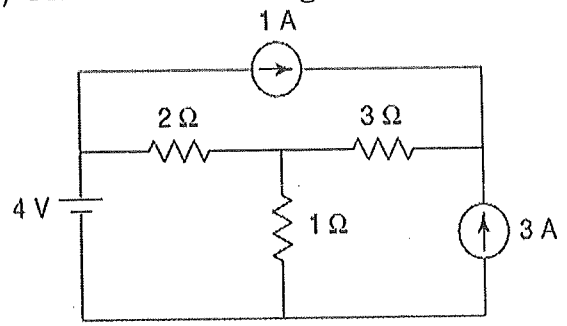
COURSE NAME: Engineering Circuit Analysis Branch: E&TC COURSE CODE: ETUA21202

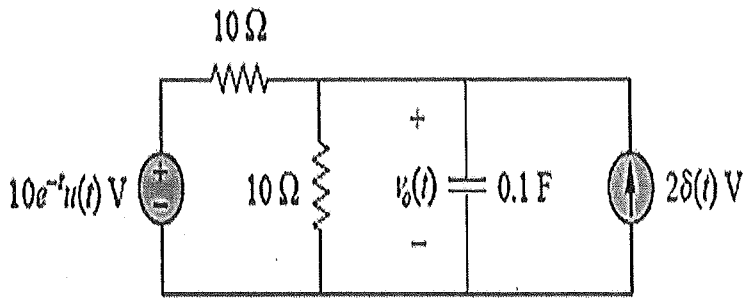
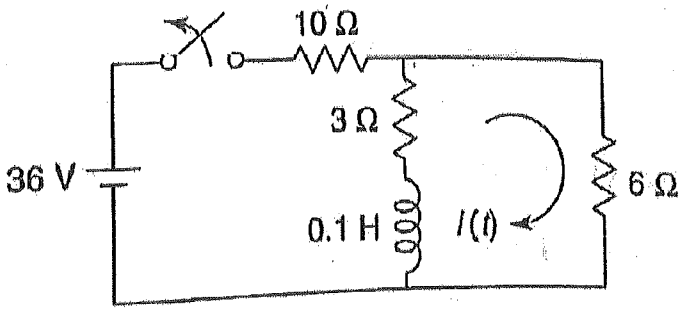
(PATTERN 2020)

Time: [2 Hrs] **[Max. Marks: 60]**

(*) Instructions to candidates:

1) **Figures to the right indicate full marks.**
2) **Use of scientific calculator is allowed**
3) **Use suitable data wherever required**
4) **All questions are compulsory. Solve any two sub questions each from each Question 1 ,2, 3,4,5,and 6 respectively**

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Draw and Explain equivalent diagram of Thevenin's and Norton's circuit	[5]	CO1	Understand
	b) Find current through 1 ohm 	[5]	CO1	Analysis
	c) Derive the expression for maximum power transfer condition applied to reactive network	[5]	CO1	Analysis
Q2	a) Draw and Explain the voltage phasor diagrams for series R-L-C circuit	[5]	CO2	Understand
	b) Justify the parallel resonance circuit as a current amplifier	[5]	CO2	Analysis
	c) Design LPF T-section with Fc=2500 Hz and Ro=1Kohm. Also compute attenuation in neper at 3000Hz and 2000Hz.	[5]	CO2	Analysis
Q3.	a) Draw and Explain initial conditions for inductor and capacitor with the help of circuit diagram	[5]	CO3	Understand
	b) Determine Vo(t) using Laplace Transform. Assume Vo(0)=5V.	[5]	CO3	Analysis

	 c) The switch is opened at t=0. Find the expression for i(t) 	[5]	CO3	Analysis
Q.4	a) Sketch the construction of N channel JFET and explain its working.	[5]	CO4	Understand
	b) Analyze Common Source with bypass capacitor amplifier circuit using N channel JFET to determine parameters as voltage gain (Av), input impedance (Zi) and output impedance (Zo).	[5]	CO4	Analysis
	c) Self-bias circuit using N channel JFET has following parameters: I_{DSS}=6mA, V_P=4V, V_{DD}=20V, R_D=3.3KΩ, R_S=1KΩ and R_G=1MΩ. Find the values of operating point parameters as I_{DQ}, V_{DSQ} and V_{GSQ}	[5]	CO4	Apply
Q.5	a) Explain following terms related to MOSFET: i) Sub-threshold conduction ii) Body effect	[5]	CO5	Understand
	b) Elaborate any three non-ideal effects in MOSFET.	[5]	CO5	Understand
	c) For Common source amplifier with voltage divider biasing circuit using N channel E-MOSFET, following parameters are given V_{DD}= 5 V, R1= 520 kΩ, R2= 320 kΩ, R_D= 10 kΩ, and R_S=0. Assume transistor parameters as Vtn= 0.8 V, Kn= 0.40 mA/V², and λ = 0. Determine gm, ro, small signal voltage gain (Av) and output resistances Ro	[5]	CO5	Apply

Q.6)	a) Sketch block diagrams of voltage series and voltage shunt negative feedback topologies.	[5]	CO6	Understand
	b) Sketch RC phase shift oscillator and and calculate oscillating frequency if R= 6.5 KΩ and C= 0.01 μF.	[5]	CO6	Apply
	c) Calculate the voltage gain (Af), input impedance(Zif) and output impedance (Zof) for voltage-series feedback amplifier having A = -100, Ri = 10 kΩ, and Ro = 20 kΩ, feedback factor (β) = - 0.1.	[5]	CO6	Apply