	Reg. No.:	
	Name :	

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TERM END EXAMINATIONS (TEE) – December 2021- January 2022

Programme	:	**B.Tech. (All)**	**Semester**	:	**Fall 2021-22**
Course Name	:	**Electric Circuits and Systems**	**Course Code**	:	**EEE1001**
Faculty Name	:	**Dr. Soumitra K Nayak**	**Slot / Class No**	:	**E11+E12+E13/0118**
Time	:	**1½ hours**	**Max. Marks**	:	**50**

Answer ALL the Questions

Q. No.		Question Description	Marks
		PART - A (30 Marks)	
1	(a)	An inductor, a variable capacitor, and a resistor are connected in series across a constant voltage, 100 Hz power supply. When the capacitor value is fixed at 100 mF, the current reaches its maximum value. Current gets reduced to half its maximum value when the capacitor value is 200 mF. Calculate the values of circuit parameters and the Q-factor of the circuit.	10
		OR	
	(b)	A sinusoidal voltage of v = 325 sin 314t when applied across an L–R series circuit causes a current of i = 14.14 sin (314t – 60°), flowing through the circuit. Calculate the value of L and R of the circuit. Also calculate power consumed.	10
2	(a)	Explain the working of a transformer. Also, derive the equation for output voltage in terms of flux and frequency assuming a sinusoidal input.	10
		OR	
	(b)	Explain the behaviour of a P-N junction & its characteristics when it is forward biased and reverse biased. Also, discuss the different types of current in P-N junction.	10
3	(a)	Explain the importance of Multiplexer in digital circuits. Also Design a 16-to-1 multiplexer using only 4-to-1 multiplexers.	10
		OR	

	(b)	Design a 4-to-16 decoder using only 2-to-4 decoders.	10
PART - B (20 Marks)			
4		A coil having an inductance of 1.4 H and a resistance of 1Ω is connected to a 12 V dc source through a switch. What will be the value of current after 400 m sec of switching on the sup-ply? How much time will it take for the steady-state current to drop to half its value after the switch is turned on?	10
5		Design a 4-bit ripple counter using J-K flip flop. Explain its operation using timing diagram for each flip flop.	10
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