H.T No

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(An Autonomous Institution)

Regulations: A17

Code No: 6AC41 **Date: 17-Aug-2023 (FN)**

B.Tech II-Year II- Semester External Examination, Aug - 2023 (Supplementary)

ELEMENTS OF ELECTRICAL ENGINEERING (CSE and IT)

Time: 3 Hours **Max.Marks:75**

Note: *a) No additional answer sheets will be provided.*
b) All sub-parts of a question must be answered at one place only, otherwise it will not be valued.
c) Missing data can be assumed suitably.

Bloom's Cognitive Levels of Learning (BCLL)

Remember	L1	Apply	L3	Evaluate	L5
Understand	L2	Analyze	L4	Create	L6

Part - A Max.Marks:25

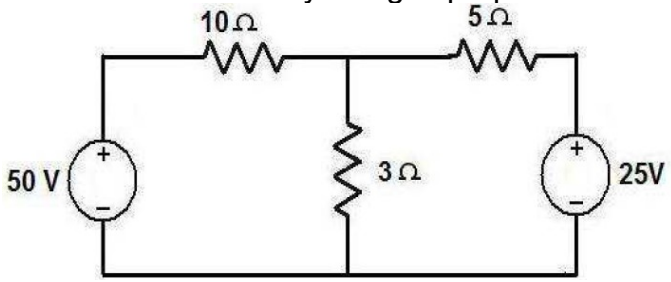
ANSWER ALL QUESTIONS

		BCLL	CO(s)	Marks
1	Estimate values of the resistors, when two resistors are connected in parallel, their equivalent resistance is 2Ω, and in series, their equivalent resistance is 9Ω.	L2	CO1	[2M]
2	Define "J" operator? and How it is used in electrical circuit analysis.	L1	CO2	[2M]
3	Recall voltage regulation in transformer and its significance.	L1	CO3	[2M]
4	Define Transformer.	L1	CO4	[2M]
5	Discuss How do you make Single-Phase Induction Motor Self-Starting.	L2	CO5	[2M]
6	Describe the controlling torque.	L1	CO6	[3M]
7	Define maximum power transformation theorem.	L1	CO1	[3M]
8	List the Losses In Transformer.	L1	CO4	[3M]
9	Define Slip.	L1	CO5	[3M]
10	State Faraday's law of electromagnetic induction.	L1	CO2	[3M]

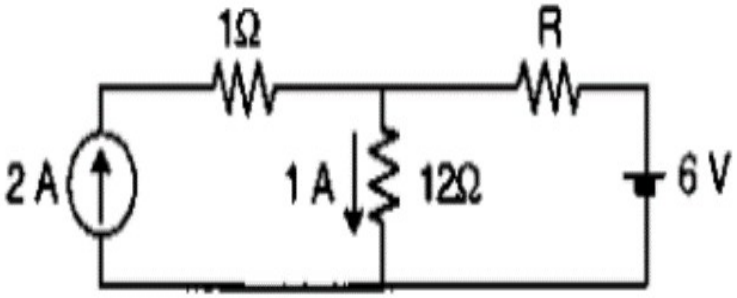
Part – B Max.Marks:50

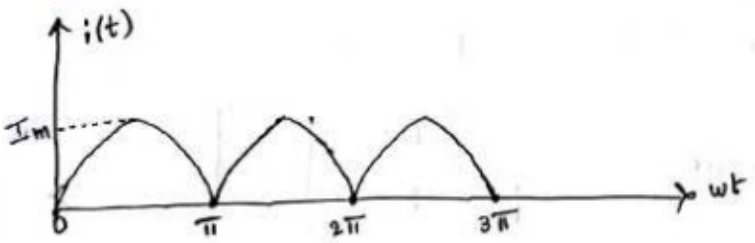
ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 10 MARKS.

			BCLL	CO(s)	Marks
11.	a)	Solve the current in 10Ω resistor by using superposition theorem.	L3	CO1	[5M]



	b)	If the 12Ω resistor draws a current of 1A as shown in the figure, Compute the value of resistance R is	L3	CO1	[5M]



12.	a)	Examine the form factor and peak factor of full wave rectified sine wave shown in figure 	L3	CO2	[5M]
	b)	A coil of resistance 20 ohms and inductance 100mH is connected in series with a capacitance of 40 microfarad across 100 V, 50 Hz ac supply. Solve (i)impedance (ii) current	L3	CO2	[5M]
13.	a)	Compute the EMF equation of DC generator.	L3	CO3	[5M]
	b)	Sketch & illustrate the types of DC Generator with their equations.	L3	CO3	[5M]
14.	a)	Derive the Equivalent circuit diagram of a single phase transformer and explain each parameters.	L3	CO4	[5M]
	b)	The test results of 2.5kVA, 230/115V single-phase transformer are as follows: OC Test : 115V, 1.2A, 60W SC Test : 12V, 10.86A. 120W Find efficiency at full load, 0.8 pf	L2	CO4	[5M]
15.	a)	Solve the phase relations between line and phase quantities in a 3-ϕ balanced Star connected system	L3	CO5	[5M]
	b)	A three phase balanced delta load of (4+j8)Ω is connected across a 400V,3-ϕ balanced supply. Solve the phase currents and line currents. Assume the phase sequence RYB	L3	CO5	[5M]
16.	a)	Sketch and Explain the operating principle of Moving Iron type instrument.	L2	CO6	[5M]
	b)	List the advantages and disadvantages of Moving instrument.	L3	CO6	[5M]
17.	a)	State and explain Kirchhoff's Laws	L2	CO1	[4M]
	b)	What is the principle of mutual induction?	L1	CO2	[3M]
	c)	List the applications of DC Shunt and DC series Motor.	L1	CO3	[3M]
18.	a)	Differentiate Ideal vs Practical Transformer.	L4	CO4	[4M]
	b)	A 3-φ 4 pole induction motor is supplied from 3φ 50Hz ac supply. Compute (i) synchronous speed (ii) rotor speed when slip is 4%	L2	CO5	[3M]
	c)	Difference between Moving Coil and Moving Iron Instrument.	L2	CO6	[3M]

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