U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

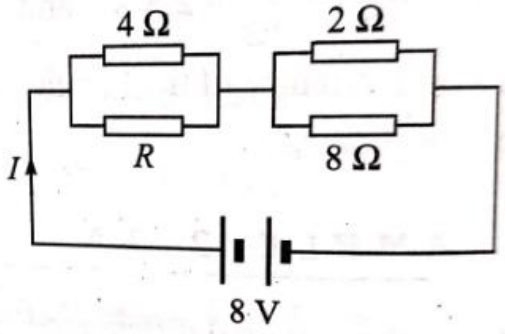
October 2024 Supplementary Examinations

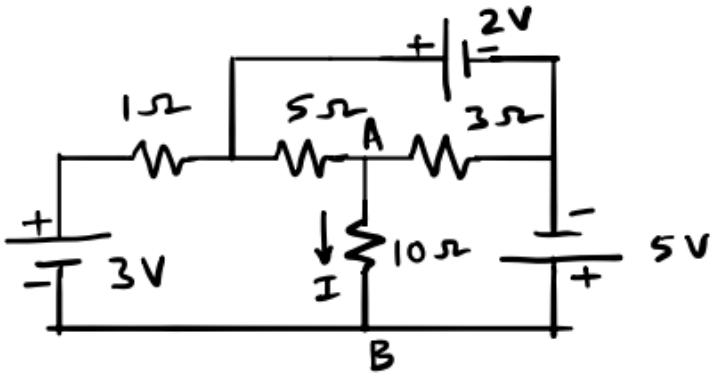
Programme: B.E. **Semester: I / II**
Branch: Common to all Branches **Duration: 3 hrs.**
Course Code: 22EE1ESIEE / 22EE2ESIEE **Max Marks: 100**
Course: Introduction to Electrical Engineering

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

SUPPLEMENTARY EXAMS 2024

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	CO	PO	Marks
1	a)		Explain the general structure of electrical power system using single line diagram.	*CO3*	*PO6*	**06**
	b)		With a neat block diagram, explain wind power generation.	*CO1*	*PO1*	**07**
	c)		The total power consumed by the network shown in fig.1(c) is 16 W. Find the value of R and the total current.  fig.1(c)	*CO2*	*PO2*	**07**
			UNIT - II			
2	a)		State and explain super position theorem with suitable circuit.	*CO1*	*PO1*	**06**
	b)		Explain the terms (i) Self-inductance and (ii) Mutual inductance with relevant equations.	*CO1*	*PO1*	**06**
	c)		A circuit has 1000 turns, enclosing a magnetic circuit 20 cm^2 in section. With 4A, the flux density is 1Wb/m^2 and with 9A, it is 1.4 Wb/m^2. Find the values of self-inductances in each case and the induced e.m.f if the current falls uniformly from 9A to 4A in 0.05 sec.	*CO2*	*PO2*	**08**
			OR			
3	a)		For the given circuit shown in Fig. 3(a), find current I using Thevenin's theorem.	*CO2*	*PO2*	**08**

			 Fig. 3(a)			
	b)	State Faraday's Laws of Electromagnetic Induction and explain dynamically induced e.m.f.	*CO1*	*PO1*	**06**
	c)	Derive an expression for the energy stored in a magnetic field.	*CO1*	*PO1*	**06**
		UNIT - III			
4	a)	Explain the terms (i) RMS value (ii) Average value (iii) Form factor.	*CO1*	*PO1*	**06**
	b)	Draw and explain with the help of neat circuit diagram and vector diagram showing the component voltages for a series R-L-C circuit under following conditions: (i) $X_C > X_L$ (ii) $X_L > X_C$ (iii) $X_L = X_C$.	*CO2*	*PO2*	**08**
	c)	Show that, Current leads Voltage by 90^0 when an AC voltage of $v = v_m \sin \omega t$ Volts is applied across a pure inductor of L Henry. Also represent it using phasor diagram and waveforms.	*CO2*	*PO2*	**06**
		UNIT – IV			
5	a)	With neat sketches explain the constructional details of core type and shell type transformers.	*CO1*	*PO1*	**06**
	b)	What are the various types of D.C Motors? Give their circuit representation, with expressions.	*CO1*	*PO1*	**06**
	c)	A 120V, DC shunt motor has an armature resistance of 0.2 ohm and a field resistance of 60 ohms. It runs at 1800 rpm, when it takes a full load current of 40 A. Find the speed of the motor when it is operating with half of its full-load.	*CO2*	*PO2*	**08**
		OR			
6	a)	Derive the emf equation of a single phase transformer referred to primary with usual notations.	*CO1*	*PO1*	**06**
	b)	Derive the torque equation of DC motor with usual notations.	*CO1*	*PO1*	**06**
	c)	In a 25 kVA, 2000/200 V, single phase transformer, the iron and full-load copper losses are 350 W and 400 W respectively. Calculate the efficiency at unity power factor on (i) full load (ii) half load	*CO2*	*PO2*	**08**
		UNIT - V			
7	a)	What do you mean by Tariff? Explain the two part tariff.	*CO3*	*PO6*	**06**
	b)	Explain the working principle of Fuse and Miniature Circuit Breaker (MCB).	*CO3*	*PO6*	**06**
	c)	With a neat block diagram explain components of Electric Vehicle.	*CO3*	*PO6*	**08**

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