U.S.N.										

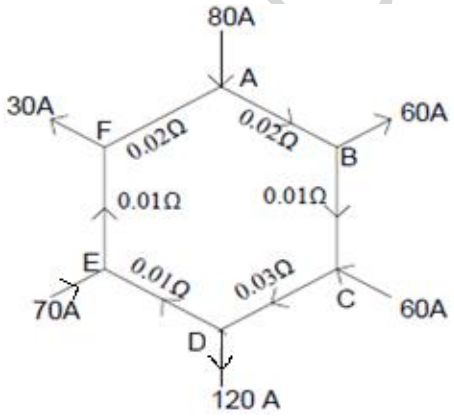
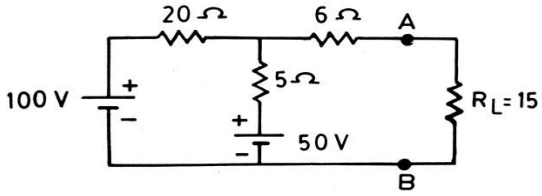
B.M.S. College of Engineering, Bengaluru-560019

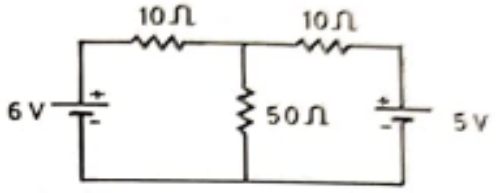
Autonomous Institute Affiliated to VTU

September / October 2023 Semester End Main Examinations

Programme: B.E. **Semester: I / II**
Branch: Electrical and Electronics Engineering **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.

		UNIT - I	CO	PO	Marks
1	a)	With a neat schematic diagram explain working of solar power plant.	CO3	PO6	**06**
	b)	With a neat single line diagram explain general structure of electrical power system.	CO3	PO6	**06**
	c)	Determine the current in all branches of the network shown in fig.1.c. using Kirchoff's laws.  fig.1.c.	CO2	PO2	**08**
		UNIT - II			
2	a)	Arrive at the expression for energy stored in an inductor.	CO1	PO1	**06**
	b)	Using the principle of superposition theorem, determine the current in 15 Ohms resistor connected between A and B in the circuit shown in Fig. 2.b.  Fig. 2.b.	CO2	PO2	**07**
	c)	Explain mutual inductance and arrive at the expression for co-efficient of coupling	CO1	PO1	**07**

			OR			
	3	a)	State and explain superposition theorem with suitable example.	*CO1*	*PO1*	**07**
		b)	Applying the principle of Thevenin's theorem, determine the current through 50Ω resistor for the circuit shown in Fig.3.b.  Fig .3.b.	*CO2*	*PO2*	**07**
		c)	Define the following terms : a) Statically induced e.m.f. b) dynamically induced e.m.f. c) Co-efficient of coupling.	*CO1*	*PO1*	**06**
			UNIT - III			
	4	a)	A series RLC circuit is supplied with an AC voltage at a frequency of f Hz. Derive an expression for the current for the following conditions (i) $X_L = X_C$ (ii) $X_L > X_C$ (iii) $X_L < X_C$	*CO2*	*PO2*	**07**
		b)	Justify that the current in a purely capacitive circuit leads the applied voltage by 90°. Draw relevant waveform and phasor diagram.	*CO2*	*PO2*	**07**
		c)	Define the following: (i) Peak value (ii) RMS value (iii) Form factor.	*CO1*	*PO1*	**06**
			UNIT - IV			
	5	a)	Arrive at an expression for torque developed by the DC motor.	*CO1*	*PO1*	**07**
		b)	A 200 kVA transformer has an efficiency of 98% at full load. If the maximum efficiency occurs at 3/4th of its full load, find its iron loss and full load copper loss. Consider pf of the load as 0.8.	*CO2*	*PO2*	**08**
		c)	Explain DC shunt motor with suitable circuit and expressions. Also mention its applications.	*CO1*	*PO1*	**05**
			OR			
	6	a)	Derive an e.m.f equation of a transformer.	*CO1*	*PO1*	**07**
		b)	A 500V DC shunt motor has 4 poles and wave connected winding with 492 conductors. The total flux is 0.2wb. Full load line current is 20A. The armature and shunt field resistances are 0.1Ω and 250Ω respectively. Calculate the speed of the motor and gross torque developed by the armature.	*CO2*	*PO2*	**08**
		c)	Explain the types of losses that occur in a transformer.	*CO1*	*PO1*	**05**
			UNIT - V			
	7	a)	With a neat block diagram explain different parts of an electric vehicles.	*CO3*	*PO6*	**08**
		b)	What is earthing? With a neat diagram explain pipe earthing.	*CO3*	*PO6*	**08**
		c)	Differentiate between Fuse and MCB.	*CO3*	*PO6*	**04**

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