MODEL QUESTION PAPER

Exam: B.E   **Branch: EEE**   **Semester: 2ND**   **Subject:**

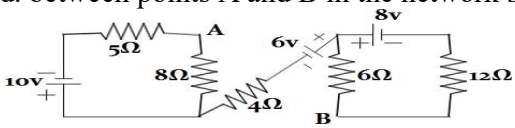**ELEMENTS OF ELECTRICAL ENGINEERING**   **Subject Code: 22EEE13**

Duration of paper: 3 Hours   **Max. Marks: 100**

Instructions to candidates:

- Answer any **FIVE** full questions, choosing **ONE** full question from each module
- Assume missing data (if any)
- Handbook is permitted

Q.No		Question	Marks	RBTL	CO	PI
		Module-1				
1	a	Define Ohm's law and write some limitations of it.	06	2	1	1.3.1
	b	Find the p.d. between points A and B in the network shown in F	07	3	1	2.1.2
	c	State and explain Kirchhoff's law	07			
		OR				
2	a	State and explain Faraday's laws of electromagnetic induction with the importance of Lenz's law	07	2	1	1.3.1
	b	From the following data, the mutual inductance between the coils is 1.5 mH. Find the inductance of each Air cored coil and the co-efficient of coupling. <table><tr><td>coil</td><td>Turns</td><td>Length cm</td><td>Cross sec. area (sq.cm)</td></tr><tr><td>A</td><td>2000</td><td>200</td><td>4</td></tr><tr><td>B</td><td>3000</td><td>300</td><td>4</td></tr></table>	07	3	1	2.1.2
	C	Derive an expression for the energy stored in an inductive coil.	06			
		Module-2				
3	a	Define the following terms (i) Form Factor (ii) Peak Factor (iii) Frequency and Time Period	06	2	2	1.3.1
	b	Derive the equation for the effective value and an average value of a sinusoidal varying current	07	3	2	1.3.1
	c	For the voltage wave e=140sin314wt. find i) peak voltage ii) average value iii) frequency iv) time period v) RMS value vi) instantaneous value at t = 3ms vii) form factor viii) peak factor	07	3	2	2.1.2
		OR				
4	a	With necessary circuit diagram, vector diagram and wave forms prove that the power drawn by the pure inductance in ac circuit is zero	07	2	2	1.3.1
	b	Find the expression for the current and calculate the power when a voltage e=283sin 314t is applied to a coil having R=50 ohm and L=0159H	07	3	2	2.1.2
	c	Using a power triangle, explain the different types of power in the 1-Ø AC system.	06	3	2	1.3.1

		Modul-3				
5	**a**	List the advantages of 3 Ph AC System	04	2	3	1.3.1
	b	In a three-phase star connection, find the relation between line and phase values of current and voltages. Also, derive the equation for three-phase power	08	3	3	1.3.1
	c	A delta-connected load consists of a resistance of 10ohm and capacitance of 100 micro farad in each phase. A supply of 410v at 50H is applied to the load. Find the line current, power factor and power consumed by the load.	08	3	3	2.1.2
		OR				
6	**a**	Show that the two watt meters are sufficient to measure three phase power. derive expression for the power factor in terms of wattmeter reading	08	3	3	1.3.1
	b	A 3-phase, 400V, motor takes an input of 40KW at 0.45 p.f lag. Find the reading of each of the two single-phase watt meters connected to measure the input	07	3	3	2.1.2
	c	Explain why one of the two-watt meters connected to measure tree phase power kickback. How is the reading of that watt meter taken?	05	3	3	1.3.1
		Module-4				
7	**a**	With a neat diagram explain the working principle of Kelvin's double bridge	07	2	4	1.3.1
	b	With a neat diagram explain the working principle of the Whetstones Bridge	07	2	4	1.3.1
	c	With a neat wiring diagram and truth, table explain the two-way control of a lamp	06	3	4	1.3.1
		OR				
8	**a**	List the various factors that are required to be considered in selecting the type of wiring for domestic wiring	06	2	4	1.3.1
	b	Mention various types of domestic wiring.	06	2	4	1.3.1
	c	List the advantages and disadvantages of wooden casing and capping wiring.	08	3	4	1.3.1
		Module-5				
9	**a**	What are the characteristics of tariffs? Explain two port tariffs	06	3	5	1.3.1
	b	Define shock what are the precautions against electric shock	06	2	5	1.3.1
	c	With a neat diagram explain pipe earthing	08	2	5	1.3.1
		OR				
10	**a**	Write a note on RCCB	06	2	5	1.3.1
	b	Explain the working principle of an electrical fuse and write some advantage and disadvantages of it	06	2	5	1.3.1
	c	Explain the working principle of an electrical miniature circuit breaker and write some advantages and disadvantages of it.	08	3	5	1.3.1

Note: RBTL **(Revised Bloom's Taxonomy Level), CO (Course Outcome), PI (Performance Indicator)**