Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025

Second Semester

Mechanical Engineering

BE3251 / UBET24202 - Basic Electrical and Electronics Engineering

(Common to Artificial Intelligence and Data Science, Biomedical Engineering, Computer Science and Engineering, Information Technology)

Regulations – 2021 & 2024

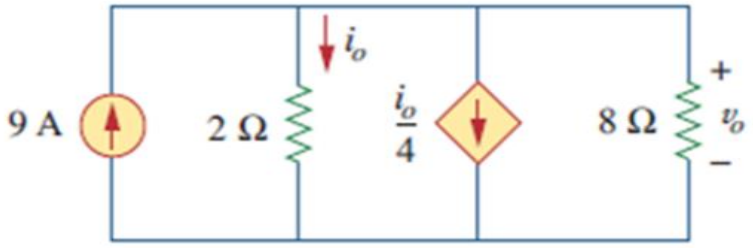
Duration : 3 Hrs *Maximum: 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	State Kirchoff's current law.	L1	1	2
2.	Write down the equation for 36 cycles sine wave current having RMS value of 25A.	L3	1	2
3.	Brief the role of brushes and commutator in DC motor.	L2	2	2
4.	Express the condition of maximum efficiency in a single-phase transformer in terms of losses.	L3	2	2
5.	Sketch the energy band diagram for a semiconductor, insulator and conductor.	L3	3	2
6.	Name the four regions of operation of a transistor.	L2	3	2
7.	Convert the decimal number 357 to binary form.	L3	4	2
8.	Recite about two variable K-Map.	L1	4	2
9.	Distinguish between moving iron and moving coil instruments.	L2	5	2
10.	Interpret the term CT in transformers.	L2	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)*

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	For the circuit shown in figure, Determine V_0 and i_0 in the given circuit.	L4	1	16



Or

	b	A wound coil that has an inductance of 180mH and a resistance of 35Ω are connected in series to a 100V 50Hz supply. Calculate: a) the impedance of the coil, b) the current, c) the power factor, and d) the apparent power consumed. Also draw the resulting power triangle for the above coil.	L4	1	16

12.	a		Explain the principle, construction and working of synchronous generator with suitable sketches.	L2	2	16
			Or			
	b		Illustrate the principle, construction and working of single-phase transformer with suitable sketches.	L2	2	16
13.	a		Describe the construction, operating principle and VI characteristics of a PN junction diode with necessary sketches and curves.	L2	3	16
			Or			
	b		Discuss the principle of operation and applications of IGBT. Also draw its characteristics curve.	L2	3	16
14.	a	i	Convert $(117.23)_{10}$ to Octal form.	L3	4	8
		ii	Convert the binary number $(101111.1101)_2$ into its decimal equivalent.	L3	4	8
			Or			
	b	i	Implement the following logical expression with logic gates Y= AB+ CB' (A+D).	L3	4	8
		ii	Simplify the following function F = Ɛm (0,2,3,4,5,6) using three variable K-Map.	L3	4	8
15.	a	i	Elaborate the functional elements of the instrumentation system.	L2	5	10
		ii	Mention the need for standards and Calibration.	L2	5	6
			Or			
	b	i	Determine the measurement of power in three phase circuits using two wattmeter method.	L2	5	10
		ii	Write short notes on PT.	L2	5	6