K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:I
Class:FY	Program:B.Tech
Branch Code:CIV/MECH/CHE	Pattern:2023
Name of Course:Basic Electrical Enginnering	Course Code:2300106A
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 pages.
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

		Marks	CO
Question No. 1			
1a)	Define insulation resistance. Derive Formula to calculate insulation resistance for single core cable.	(6)	CO1
Question No. 2			
2a)	Difference between SMPS and UPS .	(6)	CO1
Question No. 3			
3a)	Define the following terms related to AC Fundamentals 1) Amplitude 2) Frequency 3) Form Factor 4) Cycle 5) Cycle 6) Instantaneous Value 7) Time Period 8) Crest Factor	(8)	CO2
	OR		
3b)	A RC series circuit is connected across single phase AC supply, derive equation for instantaneous current also draw (i) Circuit diagram (ii) Phasor diagram (iii) Waveforms	(8)	CO2
3c)	A balanced three phase Delta connected load is supplied from three phase 400 V, 50 Hz. supply. The resistance of each coil is 15 Ω and inductive reactance of 30 Ω. Find the value of phase current, line current and total power consumed in the circuit.	(8)	CO2
	OR		
3d)	A 3-phase, 440 V supply is connected to Star connected load each of 35 Ω. Calculate line and phase currents, Line and Phase voltage, active power, Reactive power and Apparent power.	(8)	CO2
Question No. 4			
4a)	With a neat, labeled diagram, explain the construction and working principle of a DC generator.	(8)	CO3
	OR		
4b)	Explain Rewirable fuse (KitKat Fuse) and also write the advantages of using MCBs over traditional fuses.	(8)	CO3

4c)	What is a stepper motor? Explain how it works. Write about different types of stepper motors with neat diagrams.	(8)	CO3

OR

4d)	Discuss the importance of earthing in electrical installations and describe any one method of earthing.	(8)	CO3

Question No. 5

5a)	Explain iron loss and copper loss in a transformer. What factors affect these losses, and how can they be minimized in practical applications?	(8)	CO5

OR

5b)	Derive the EMF equation of a transformer and explain each term.	(8)	CO5
5c)	A transformer is rated at 1200 kVA at full load its copper losses is 1850W and its iron losses is 950 W, Calculate: (1) Efficiency at full load, unity power factor (2) Efficiency at 75% full load, 0.85 power factor	(8)	CO5

OR

5d)	A 1100 KVA ,2200 V/220V,50Hz, single phase transformer has an iron loss of 2500 Watt. The resistance of Primary and secondary winding is 0.68 Ω and 0.0068 Ω respectively, If the load power factor is 0.8 lagging, calculate its efficiency on full load and half load.	(8)	CO5

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