

Enrolment No./Seat No _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-I&II EXAMINATION – SUMMER 2025

Subject Code:BE01000051

Date:13-06-2025

Subject Name:Basic Electrical Engineering

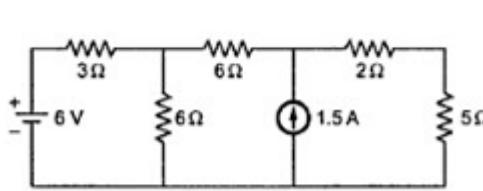
Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	Marks
Q.1 (a) State Ohm's law and Kirchhoff's laws in context with DC circuits.	03
(b) Compare resistive series and parallel circuit.	04
(c) Find the current through 5 ohm resistance using the superposition theorem.	07



Q.2 (a) Define Q factor of series RLC circuit. What is the importance of it?	03
(b) Draw impedance triangle, voltage triangle and power triangle for single phase R-L circuit.	04
(c) Prove that current in purely capacitive circuit current leads its voltage by 90 and average consumption in pure capacitive circuit is 0.	07

OR

(c) A single phase R-L-C circuit having resistance of 8Ω , inductance of 80 mH and capacitance of $100 \mu\text{F}$ is connected across single phase ac 150 V , 50 Hz supply. Calculate the current, power factor and voltage drop across inductance and capacitance.	07
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Q.3 (a) Explain magnetic hysteresis.	03
(b) Explain working principle of single phase Transformer.	04
(c) Explain with diagram construction of core type and shell type transformer.	07

OR

(a) Derive the E.M.F. equation of a single phase transformer.	03
(b) Explain the terms:- 1. Flux density 2. Reluctance 3. Permeability 4. Electric field strength.	04
(c) State comparison between practical transformer and ideal transformer.	07

Q.4 (a) Give comparison between Fuse and MCB. **03**
(b) Mention the types of single phase induction motor. Explain any one of them. **04**
(c) Give merit, demerit and application of induction motors. **07**

OR

(a) Explain the working principle of single phase induction motor. **03**
(b) Explain why single-phase induction motors are commonly used in household appliances like fans and refrigerators. **04**
(c) Explain generation of rotating manetic field in 1 – phase induction motor with diagram and equations. **07**

Q.5 (a) Write short note on ELCB. **03**
(b) Write safety precaution for electrical appliances. **04**
(c) What is battery? Explain the construction and working of any battery. **07**

OR

(a) Give a list of safety device used for electrical appliances. **03**
(b) What is need of earthing ? Explain the different method of earthing. **04**
(c) Calculate the electricity bill amount for a month of April, if 4 bulbs of 40 W for 5 h, 4 tube lights of 60 W for 5 h, a TV of 100 W for 6 h, a washing machine of 400 W for 3 h, a water pump of 0.5 HP for 15 minutes are used per day. The cost per unit is Rs 3.50. Consider 1 HP = 746 watts. **07**
