

Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 1 – EXAMINATION – SUMMER 2026

Subject Code: BE01000051 / BE01R00051

Date: 20/06/2026

Subject Name: Basic Electrical Engineering

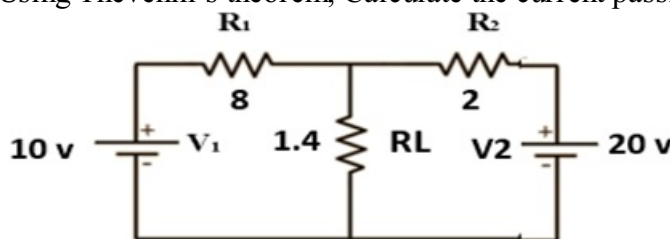
Time: 10:30 AM TO 01:00 PM

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.

- Q.1** (a) Demonstrate Kirchhoff's Current Law **03**
(b) Define Active, Reactive, Apparent Power and Power factor. **04**
(c) Using Thevenin's theorem, Calculate the current passing through load resistance, **07**



- Q.2** (a) Compare electric circuit and magnetic circuit **03**
(b) Explain 3-phase power measurement by two wattmeter method **04**
(c) Explain the condition for resonance in a series RLC circuit. Derive the expression for resonant frequency and sketch the graphs of frequency versus current, impedance, power factor, and V_L or V_C **07**

OR

- Q.2** (c) Derive relation between line voltage and phase voltage in star connection **07**
Q.3 (a) Draw the construction of single phase transformer and mention the main parts. **03**
(b) List the types of split-phase induction motors. Which type is most suitable for heavy-duty load applications with a good power factor? Justify your answer **04**
(c) Draw and Explain B-H Curve **07**

OR

- Q.3** (a) Explain Working of single phase transformer **03**
(b) Discuss the reason behind the non-self-starting nature of a single-phase induction motor. What are the essential conditions required to produce a rotating magnetic field?" **04**
(c) Define MMF, Magnetic field intensity, Magnetic flux density, reluctance, permeance, reluctivity, permeability **07**
Q.4 (a) What are the various types of lamps used in practice? Which lamp is most suitable for domestic use and why? **03**
(b) Demonstrate working of miniature circuit breaker **04**

	(c) Explain Working of BLDC Motor	07
	OR	
Q.4	(a) Differentiate between a fuse and an Miniature Circuit Breaker	03
	(b) Explain the working of ELCB	04
	(c) Draw the construction of BLDC motor and explain function of each part	07
Q.5	(a) What are lighting fixtures and reflectors? Give two examples of each.	03
	(b) List the types of lightning scheme with general diagram	04
	(c) State the importance of earthing and list its types. Explain any one type in detail.	07
	OR	
Q.5	(a) State important characteristics of battery	03
	(b) What safety precautions should be taken while dealing with electrical appliances?	04
	(c) Calculate the monthly energy consumption and energy charge for the month of June for the following electrical appliances: 5 bulbs of 20 W used for 5 hours/day, 4 ceiling fan used for 13 hours/day, a TV of 120 W used for 9 hours/day, a washing machine of 400 W used for 3 hours/day, and a 1 HP water pump used for 30 minutes/day. The cost per unit is Rs 4.50. (1 HP = 746 W)	07
