

Roll No.

Total No. of Pages: 02

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B.Tech. (AE/AI&ML/AI&DS/EE/ECE/EEE/FT/IT/CSE/AI/CE/ME/Automation & Robotics/Internet of Things and Cyber Security including Block Chain Technology) (Sem.-1,2)

BASIC ELECTRICAL ENGINEERING

Subject Code: BTEE-101-18

M.Code : 75339

Date of Examination : 27-05-2025

Time : 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION - B & C** have **FOUR** questions each.
3. Attempt any **FIVE** questions from **SECTION B & C** carrying **EIGHT** marks each.
4. Select at least **TWO** questions from **SECTION - B & C**.

SECTION - A

- 1. Answer following questions in brief :**
- What are the various losses in a single-phase transformer?
 - State and explain the Kirchoff's current law.
 - What is the function of a contactor in electric circuits?
 - What are voltage and current relation in star and delta connections?
 - Draw the Thevenin's equivalent circuit. What is Thevenin's impedance?
 - Explain the working principle of a single-phase induction motor.
 - What are the various types of electrical loads?
 - What is the need of power factor improvement in the electric systems? How it is carried out?
 - Draw the electric circuit of an auto-transformer.
 - Draw the power triangle. Explain it.

SECTION - B

2. Draw and explain the electric circuit of a miniature circuit breaker.
3. A coil takes a current of 6 A, when connected to a 24 V DC supply. To obtain the same current with a 50 Hz AC supply, the voltage required was 30 V. Calculate :
 - a) The inductance of the coil.
 - b) The power factor of the coil.
4. The power input to a 3-phase induction motor is 80 kW. The stator losses total 1.5 kW. Find the total mechanical power developed, if the motor is running with a slip of 4%.
5. State and explain the Superposition theorem, with an example.

SECTION - C

6. Derive time-domain voltage-current relations for first order RC circuit.
7. A 200 kVA, 3300/240 V, 50-Hz single-phase transformer has 80 turns on the secondary winding. Assume an ideal transformer.

Calculate :

- a) Primary and secondary current on full load
 - b) The maximum value of flux
 - c) The number of primary turns.
8. Derive an equation for resonant frequency for a parallel RLC circuit.
 9. **Write a short note on :**
 - a) Types of batteries and their characteristics
 - b) Earthing and its need.

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC against the Student.