

Roll No.

Total No. of Pages : 02

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**B.Tech. (AI&DS / AI&ML / Block Chain / CE / CSE / CS / DS / IOT / CSD /
EEE / EE / ECE / ETE / FT / IT / ME / Robotics & Artificial Intelligence /
Internet of Things and Cyber Security including Block Chain
Technology) (Sem.-1,2)**

BASIC ELECTRICAL ENGINEERING

Subject Code : BTEE101-18

M.Code : 93797

Date of Examination : 05-06-2025

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 atleast **TWO** questions from **SECTION - B & C**.

SECTION-A

- I. Write short notes on :**
- a) What is the function of a contactor?
 - b) What is an apparent power? Draw the power triangle.
 - c) What are the demerits of low power factor to an electric AC system?
 - d) What are dependent voltage and current sources?
 - e) Draw the electric circuit schematic of a step down auto-transformer.
 - f) Distinguish between the active and passive elements.
 - g) Explain the working principle of a single-phase induction motor.
 - h) Enlist the types of batteries in electric systems.
 - i) Draw and explain in brief, the BH curve for a typical magnetic material.
 - j) Explain the three-phase balanced circuits.

SECTION-B

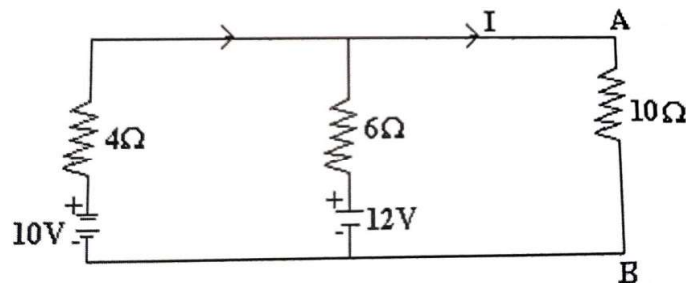
2. Draw and explain the electric circuit schematic of an earth leakage circuit breaker.
3. State and prove the Superposition theorem. Give example.
4. Prove that the emf in DC machines is directly proportional to flux per pole and speed. Derive it.
5. A capacitor has a capacitance of $30\ \mu\text{F}$. Find its capacitive reactance for frequencies of 25 Hz and 50 Hz. Find in each case the current, if the supply voltage is 440 V.

SECTION-C

6. A choke coil is connected in series with a $200\ \mu\text{F}$ capacitor. With a constant supply voltage of 250 V, it is found that the circuit takes its maximum current of 50 A, when the supply frequency is 100 Hz.

Determine :

- a) Resistance and inductance of the choke coil.
 - b) Voltage across the capacitor.
 - c) Q-factor of the circuit.
7. What is the purpose of earthing? Explain the procedure for implementing any one type of earthing in a domestic system.
 8. Calculate the value of voltage regulation at 0.8 pf lagging for a transformer with resistance drop 2% and reactance drop of 4% of the voltage. Hence, explain the significance of the voltage regulation. (6, 2)
 9. Determine the current I in the network by using Thevenin's theorem. Use figure below.



NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.