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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(AI&ML/DS/Block Chain/CE/CSE/EEE/EE/ECE/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 : 08-01-2025

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

1. Write briefly :

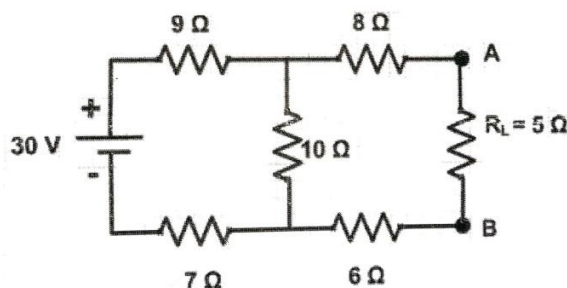
- a) What is ohm's law? Also discuss the limitations of ohm's law.
- b) An Electric iron is rated 1000W, 240V. Find the current drawn & resistance of the heating element.
- c) Describe the 'form factor' and 'peak factor' in terms of alternating current.
- d) Define resonance in an AC circuit.
- e) What is the necessity of Earthing?
- f) Explain the concept of power factor and its significance.
- g) Define magnetic materials and provide examples.
- h) Describe and state the laws of Kirchhoff.
- i) State the purpose of earthing in electrical systems
- j) What is the principle of power factor correction?

SECTION-B

2. Discuss the time domain analysis of first order Series RL Circuit with circuit diagram.
3. A series circuit consisting of a 10Ω resistor, a $100\mu\text{F}$ capacitor and a 10 mH inductor is driven by a 50 Hz A.C. voltage source of maximum value 100 volts . Calculate the equivalent impedance, current in the circuit and the phase angle.
4. For the single-phase transformer, obtain an expression for EMF induced in either primary side or secondary side.
5. With a neat circuit diagram, explain the behavior of individual components (resistor, inductor, capacitor) in an AC circuit.

SECTION-C

6. Explain the purpose and functionality of a Switch Fuse Unit. Discuss the various types of fuses used in electrical wiring systems.
7. Derive the numerical relationship between line and phase currents for a balanced 3- phase delta connection.
8. State and explain Thevenin's theorem. Using Thevenin's theorem, determine the current flowing through the load resistance (R_L) in Figure 1.



9. Explain how a rotating magnetic field is generated in a three-phase induction motor. Define the torque-slip characteristic of an induction motor.

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.