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Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech.(AI&DS/AI&ML/Block Chain/CE/CSE/CS/DS/
IOT/CSD/EEE/EE/ECE/Industry Integrated/ECS/IT/ME/
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 : 06-01-2026

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. **Write briefly:**
 - a) Classify various types of AC loads in electric systems.
 - b) Explain the working principle of single-phase induction motor.
 - c) Draw the impedance triangle. Express various units involved.
 - d) What are the advantages of improvement of power factor?
 - e) What is the difference between series and parallel resonance?
 - f) Classify the types of wiring in electric systems.
 - g) How do you explain the efficiency of a transformer? Highlight the losses involved.
 - h) State Kirchhoff's laws, with relevant schematics.
 - i) In an AC circuit, the impressed voltage is $V = (100-j50)$ V and the current in the circuit given by $I = (3-j4)$ A. Estimate real and reactive powers.
 - j) Draw the torque-speed curve of a DC motor.

SECTION - B

2. Draw and explain the schematic of earth leakage circuit breaker.
3. An inductive circuit draws 10 A and 1 kW from a 200 V, 50 Hz AC supply. Determine
 - a) The impedance in cartesian form $(a+jb)$.
 - b) The impedance in polar form $Z\angle\theta$.
 - c) The power factor.
 - d) The reactive power.
 - e) The apparent power.
4. State and prove the Thevenin's theorem with the help of an example.
5. A 4-pole, 50 Hz, 3-phase induction motor has no load slip of 1% and full load slip of 4% Calculate the a) no load speed and b) full load speed.

SECTION - C

6. What is the need of earthing in electric systems? Explain any one type of it.
7. A resistance of 20 Ohms, inductance 0.2 H and capacitance of 150 μF are connected in series and are fed by a 236 V, 50 Hz AC supply. Find X_L , X_C , Z, Y, power factor active power and reactive power.
8. A transformer has 3% resistance and 7% leakage impedance. Find its voltage regulation foil load 0.8 power factor lag.
9. Derive the voltage and current equations for 1st order RC circuit. Also, draw the respective waveforms.

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.