

Roll No.

Total No. of Pages: 02

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B.Tech. (AE/AI&ML / CSE / DS / EE / ECE / EEE/F.T/IT/CE/ME/Robotics & Artificial Intelligence/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 : 04-05-2024

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. Answer following questions in brief :

- a) What is the difference between real and reactive power?
- b) What is voltage regulation of a single-phase transformer?
- c) What is the importance of power factor?
- d) What are various components of LT switchgear?
- e) Differentiate between the dependent and independent voltage-current sources.
- f) *Series RLC circuit is also called voltage circuit at resonance.* Justify.
- g) Derive an equation for rotor speed for an induction motor.
- h) Enlist the types of batteries.
- i) What is the difference between active and passive elements?
- j) What are three-phase balanced circuits?

SECTION-B

2. In a particular RL series circuit a voltage of 10 V at 50 Hz produces a current of 700 mA while the same voltage at 75 Hz produces 500 mA. What are the values of R and L in the circuit?
3. State and explain the Norton's theorem. Give one example to prove this.
4. Explain the torque-speed curve of a three-phase induction motor. Hence, enlist its any two applications.
5. Draw and explain the electric circuit of an earth leakage circuit breaker.

SECTION-C

6. Explain the types of wires and cables along with its applications in Electrical Systems.
7. Derive an equation for resonant frequency for a series RLC circuit at resonance.
8. Derive the voltage and current equations for a series RL circuit excited by an AC source.
9. A single-phase 50 Hz transformer has 30 primary and 350 secondary turns. The net cross-sectional area of the core is 250 cm^2 . If the primary winding is connected to a 230 V, 50 Hz supply, calculate :
 - a) peak value of flux density in the core
 - b) voltage induced in the secondary winding. Neglect losses, what is the primary current when the secondary current is 100 A?

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.