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Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech. (AI&ML/CE/CSE/CS&D/DS/EEE/EE/ECE/IT/ME/Robotics &
AI/(Internet of Things and Cyber Security including Block Chain
Technology) (Sem.-1)**

BASIC ELECTRICAL ENGINEERING

Subject Code : BTEE101-18

M.Code : 93797

Date of Examination: 11-12-2023

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 the following :

- a) Classify various types of electric cables.
- b) A series RL circuit draws a current of 1 A, when contacted across a 10 V, 50 Hz AC supply. Assuming the resistance 5 ohms, find the inductance of the circuit. What is its power factor.
- c) What is phasor representation?
- d) Based on power factor, categorize the different kinds of electrical loads.
- e) What is the difference between wire & cable?
- f) Give an explanation of the peak and form factors in terms of alternating current.
- g) What are the classifications of magnetic materials based on their magnetic properties?
- h) State and explain the Kirchhoffs Laws.
- i) Identify and explain the different losses in a transformer,
- j) State the purpose of earthing in electrical systems.

SECTION-B

2. For a balanced three-phase delta connection, determine the numerical relationship between the line and phase currents.
3. A series RLC circuit of $R = 40\ \Omega$, $L = 50.07\text{mH}$ and a capacitor is connected across a 400V, 50Hz, A.C supply. This RLC combination draws a current of 10A.

Calculate (i) Power factor of the circuit, (ii) Capacitor value.

4. Briefly introduce the single-phase induction motor. Discuss the methods used for starting induction motors.
5. State and explain Norton's theorem. Using Norton's theorem, determine the current flowing through the load resistance (R_L) in Figure 1.

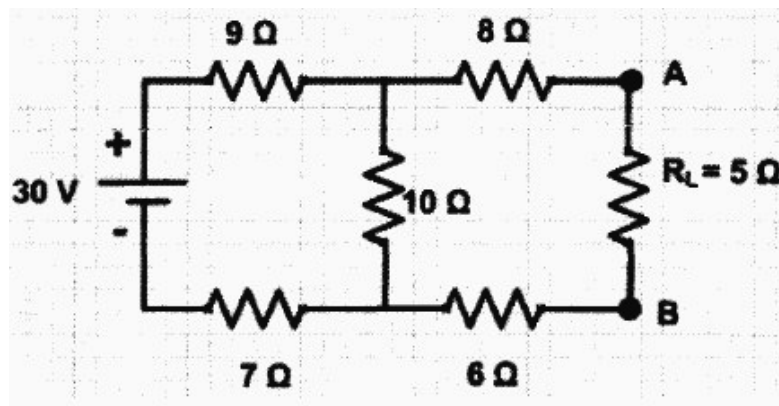


Fig.1

SECTION-C

6. Describe the BH curve and its significance in characterizing magnetic materials.
7. Compare Miniature Circuit Breaker (MCB) and Earth Leakage Circuit Breaker (ELCB).
8. Explain the principle of operation of a transformer. Derive an EMF equation for a single-phase transformer. Also, draw the phasor diagram of a single-phase transformer at leading power factor load.
9. What is the significance of a rotating magnetic field in motor operation? Describe the constructional features of a three-phase induction motor.

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