

ECE 102

B. TECH. Ist SEMESTER EXAMINATION, 2025-26

Bachelor of Technology

(ME & CSE)

Basic Electrical Engineering

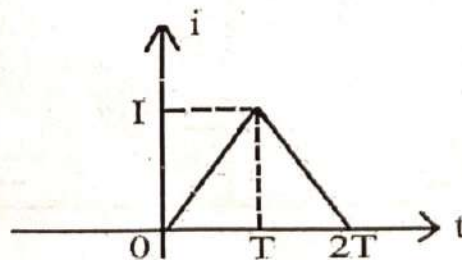
Time : Three Hours]

[Maximum Marks : 75

Note: There are **three** sections (A, B and C) and candidate has to attempt questions from all sections. Marks are indicated against each section.

Section-A

1. Attempt **all** questions : $5 \times 3 = 15$
- (a) What do you mean by an electric network and an electric circuit ?
 - (b) State and explain Kirchhoff's Law.
 - (c) State super position theorem.
 - (d) What is balanced load and unbalanced load ?
 - (e) Find the rms and average value of the following waveform.



Section-B

Note: Attempt **all** questions :

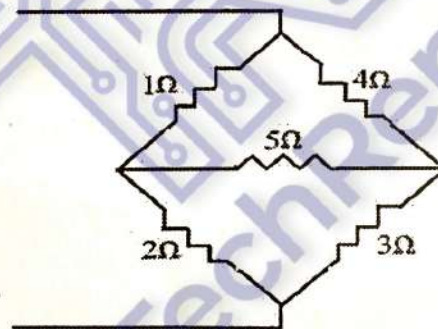
4×5=20

2. (a) Explain the following.

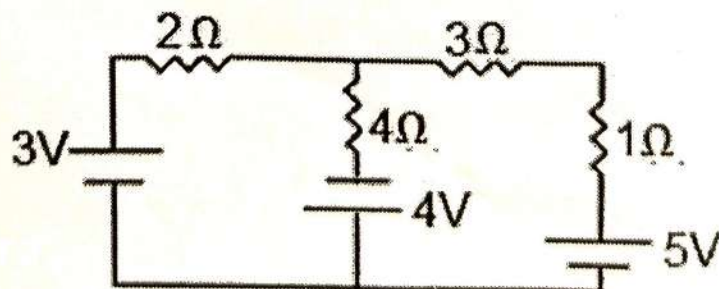
- (i) Average value
- (ii) RMS value
- (iii) Peak factor
- (iv) Form factor

Or

(b) Find the equivalent resistance of the following circuit.



3. (a) Find the value of current flowing through 4Ω resistance by using Norton's theorem in the following circuit.



Or

- (b) Derive the quality factor Q of the series R-L-C circuit at resonance.
4. (a) What is star connection and delta connection? Also derive relation between phase and line values of voltage for star connection.

Or

- (b) A moving iron instrument having an internal resistance of 50Ω indicates full scale deflection with a current of 10mA . How can it be made to work as.
- (i) Voltmeter to read 100V on full scale
- (ii) An ammeter of 1A on full scale
5. (a) What is the hysteresis loss and eddy current loss ?

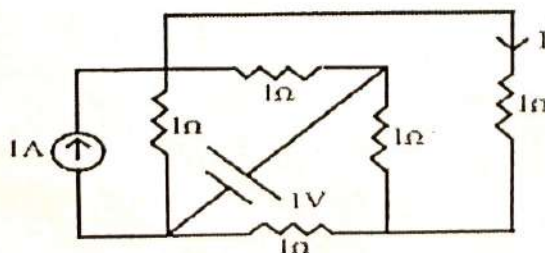
Or

- (b) Explain B-H curve of magnetic material.

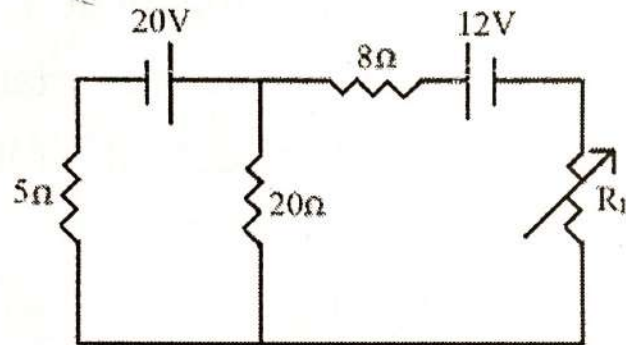
Section-C

Note: Attempt any **two** questions : $2 \times 20 = 40$

6. Find the value of " I " using Nodal Analysis.



7. State and prove maximum power transfer theorem and also determine the value of ' R_L ' such that maximum power dissipated through load.



8. Describe construction and working principle of PMMC with the help of proper diagram.
9. Explain working principle of transformer and also derive its EMF equation.

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