

# TEEGALA KRISHNA REDDY ENGINEERING COLLEGE

(UGC – AUTONOMOUS)  
B TECH I Semester Examinations, July 2021  
(Common to EEE, CSE, IT)

## BASIC ELECTRICAL ENGINEERING

Answer any Five questions  
All questions carry equal marks

Time : 3 Hours

Max. Marks : 75

- Derive the equation for power in R-C Series circuit along with vector diagram and waveform for current and voltage.
  - Two 12V batteries with internal resistances 0.2 ohm and 0.25 ohm respectively are joined in parallel and a resistance of 1 ohm is placed across the terminals. Find the current supplied by each battery. [7+8]
- Show that in a Star or wye connected network  $V_L = \sqrt{3} V_{PH}$  with the help of neat vector diagram.
  - State and explain thevenin's theorem. [8+7]
- Find  $I_X$  using super position rule for the circuit shown below:

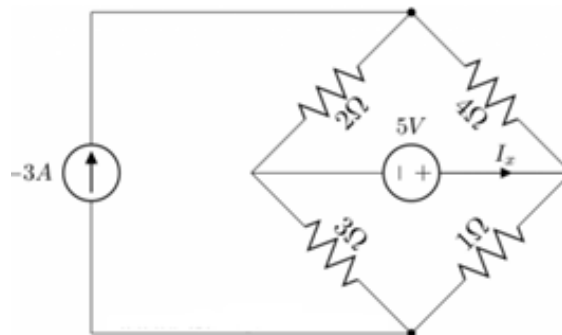


Figure: 1

- Define R.M.S. value of a sinusoidal varying voltage and deduce the expression for the same in terms of peak value. [8+7]
- A single phase 20KVA transformer has 1000 turns on primary winding and 2500 turns on secondary winding. The net cross sectional area of core is 100 cm<sup>2</sup>. When the primary winding is connected to 500V, 50Hz supply. Calculate (i) The max value of flux density in the core (ii) the voltage induced in the secondary winding (iii) primary and secondary full load current (iv) Identify the type of transformer based on number of turns and input/output voltage [15]

    - Explain types of losses in a transformer and condition for maximum efficiency.
    - Derive the condition for maximum efficiency in a single phase transformer. [7+8]
  - Explain the operation of an auto transformer with a neat diagram.
    - Prove that the magnetic field in three phase induction motor is rotating with constant Magnitude. [7+8]

7. a) Describe the working and construction of 3-Phase induction motor with a help of neat sketch.

b) Explain the different types of speed control methods for Induction Motor. [8+7]

8. a) Explain the role of ELCB in Domestic wiring and working principle of ELCB with help of a neat diagram.

b) Calculate the electricity bill amount for a month of 30 days, if the following devices are used as specified:

1) 2 bulbs of 40w for 6 hours

2) 2 tube lights of 50w for 8 hours

3) a TV of 120w for 6 hours.

Given the cost of electricity is 2.50 rps per unit.

[7+8]

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