CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–B.TECH–I–Semester End Examinations (Regular) - February- 2024
BASIC ELECTRICAL ENGINEERING
(Common for IT, CSD, CSM)

[Time: 3 Hours]   [Max. Marks: 60]

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 10 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

## PART-A   (10 Marks)

1. a) Define ohm's law and write its limitations.   [1M]
   b) What is Source transformation technique?   [1M]
   c) Define power factor?   [1M]
   d) Write the advantages of sine wave in A.C quantities.   [1M]
   e) Draw the equivalent circuit of transformer referred to primary. [1M]
   f) Why transformer is rated in KVA?   [1M]
   g) List the different types of DC Motors.   [1M]
   h) What are the characteristics of DC motors?   [1M]
   i) Define Slip of an induction motor.   [1M]
   j) Why Induction motor is called rotating transformer?   [1M]

PART-B   (50 Marks)
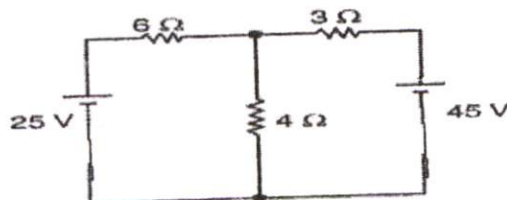
2. a) Analyze the V-I relationship between R L C Parameters.   [5M]
   b) Apply Thevenin's theorem to find the Thevenin's equivalent circuit between the nodes A-B   [5M]

OR
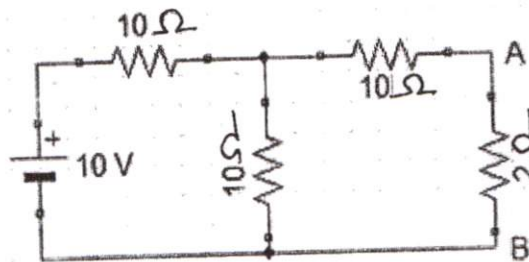
3. a) Using Kirchhoff's laws, find the current in various resistors in the circuit shown   [5M]

   b) State and explain Superposition theorem with an example.   [5M]

4. a) Analyse RL Series circuit with necessary diagrams and equations. [5M]
   b) A resistance of 30Ω, and a capacitance of 200µF are connected in series across a [5M]
      230V, 50Hz supply. Find (i) Current (ii) Phase angle iii) Voltage across each element.
      iv) Active and Reactive power.

OR

5. a) Define following terms [5M]
      i.   Instantaneous value
      ii. Cycle
      iii. Time period
      iv. Frequency
      iv. Amplitude [5M]
   b) Derive expression for relation between phase and line voltages and currents of 3-
      phase balanced star connection.

6. Draw the constructional diagram of a single –phase transformer and explain all the [10M]
   parts.

OR

7. a) Compare Core type & Shell type transformer. [5M]
   b) Explain about auto transformer. [5M]

8. Describe the constructional details of D.C machines in detail with neat sketch. [10M]

OR

9. a) Define Torque and derive the expression for torque in a D.C. Motor. [5M]
   b) What are the losses occur in a D.C Generator? [5M]

10. Explain construction and working principle of three-phase induction motor. [10M]

OR

11.a) List the starting methods of three-phase induction motor and explain any one of them [5M]
     in details.
   b) A three phase induction motor is wound for 4 poles and is supplied from 50 Hz [5M]
      System. Calculate (i) synchronous speed (ii) speed of the motor when slip is 4% and
      (iii) Rotor current frequency when the motor runs at 600rpm.

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