CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–B.TECH–II–Semester End Examinations (Supply) - December- 2025
BASIC ELECTRICAL ENGINEERING
(Common for CSM, ECE, AI&DS)

[Time: 3 Hours]   **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 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   (20 Marks)

1. a) State Kirchhoff's laws.   [2M]
   b) Define dependent sources.   [2M]
   c) Write the formulae to find out the RMS and Average value of a sinusoidal waveform.   [2M]
   d) A sinusoidal voltage is applied to the inductor of 2mH, the frequency is 3KHz. Determine the inductive reactance.   [2M]
   e) Why a transformer is not being operated on dc supply?   [2M]
   f) List out various losses in a transformer.   [2M]
   g) State Fleming's Right hand rule.   [2M]
   h) List out the applications of DC Series Motor.   [2M]
   i) Define the slip of an induction Motor.   [2M]
   j) A 3-phase, 4-pole, 50 Hz induction motor is running at 1455 rpm. Find the synchronous speed and slip.   [2M]

PART-B   (50 Marks)

2. Find the current in 10Ω resistor by using superposition theorem.   [10M]
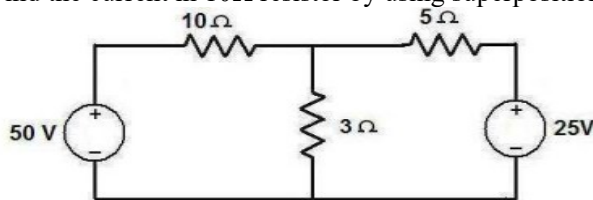
OR

3. Derive the time domain analysis of RL circuit with DC excitation.   [10M]

4. Derive the RMS value and average value for sinusoidal waveform and find form factor.   [10M]

OR

5. Explain the response to sinusoidal excitation for a pure resistance circuit and pure inductance circuit.   [10M]

6. Explain the operation of a single-phase transformer on lagging load and draw the relevant phasor diagram.   [10M]

OR

7. Explain the construction and working of an auto transformer.   [10M]

8. Derive the EMF Equation of a DC machine.   [10M]

OR

9. Describe the constructional details of DC Machine with neat sketches.   [10M]

10. Explain the working of an alternator.   [10M]

OR

11. Sketch the Torque - Slip characteristics of 3- phase induction motor and explain.   [10M]

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