Code No.: EE204ES | R20 | H.T.No. | | | 8 | R | | | | | |

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

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

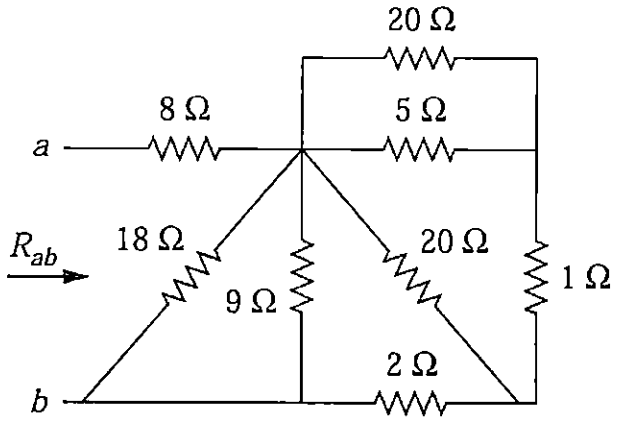
Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(20 Marks)**

1. a) State Kirchhoff's laws. [2M]
   b) Three resistors having 4 Ω, 4 Ω and 2 Ω are connected in parallel, calculate the equivalent resistance. [2M]
   c) Define power factor. [2M]
   d) Write the line and phase value relationship for voltage and for current in star connected balanced 3-ph system. [2M]
   e) What is a step-up and step-down transformer? [2M]
   f) Define transformation ratio in a transformer. [2M]
   g) What is back emf in DC motor? [2M]
   h) Name the basic parts of a DC machine. [2M]
   i) Define Slip of 3-ph induction motor. [2M]
   j) Name the types of synchronous generators based on their rotor construction. [2M]

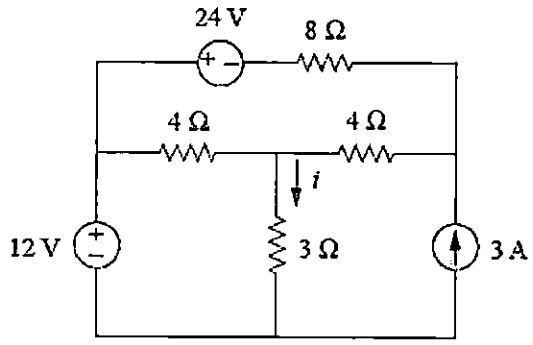
PART-B **(50 Marks)**

2.a) State and explain KCL with suitable example. [4M]
   b) Determine the equivalent resistance R_{ab} in the below circuit. [6M]



OR

3. Determine the current in 3Ω by using Superposition theorem for the circuit shown below. [10M]



4. Determine the expression for RMS and Average value for a sinusoidal quantity. [10M]

OR

5. a) Distinguish between Star and Delta connected 3-ph system. [5M]
   b) Obtain the response of series RC circuit excited with 1-ph AC supply. [5M]

6. a) Describe various losses occur in a transformer. [4M]
   b) Obtain the condition for maximum efficiency in a transformer. [6M]

OR

7. Explain about auto transformer with neat circuit diagram and list its advantages and disadvantages. [10M]

8. Describe the constructional details of DC machine with neat sketch. [10M]

OR

9. a) Obtain the expression for torque in DC motor. [7M]
   b) What is the significance of back emf in DC motor. [3M]

10. Explain the constructional details of salient pole rotor synchronous generator and mention its advantages. [10M]

OR

11. Explain the various starting methods of 3-ph induction motor. [10M]

****