

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS

I-B.TECH-II-Semester End Examinations (Supply) – December - 2025
BASIC ELECTRICAL ENGINEERING
(Common for ECE, CSE, IT)

[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

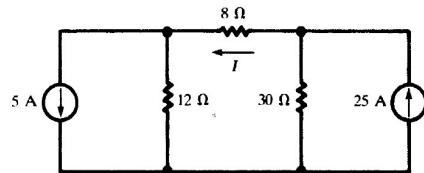
(10 Marks)

1. a) What are the current sources?	[1M]
b) State KVL.	[1M]
c) What is active power?	[1M]
d) What is the relation between phase and line voltage in a 3-phase balanced delta connection?	[1M]
e) What are the losses of a transformer?	[1M]
f) Give the typical value of the efficiency of a transformer.	[1M]
g) What is the function of brushes in a d.c generator?	[1M]
h) What is the significance of back e.m.f in a d.c motor?	[1M]
i) Define the slip speed of a 3-phase Induction motor.	[1M]
j) Give the applications of a 3-phase Induction Motor.	[1M]

PART-B

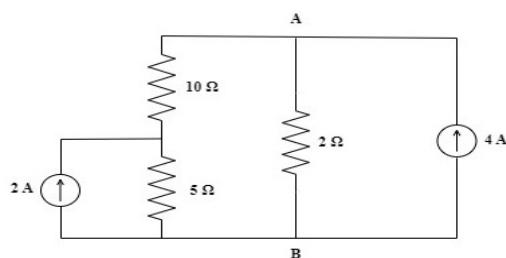
(50 Marks)

2.a) State and explain Thevenin's theorem.	[5M]
b) Find the current (I) flowing through an 8-ohm resistance.	[5M]



OR

3.a) State and explain Norton's theorem.	[5M]
b) Find the current flowing through the 10 Ω resistance using the superposition theorem.	[5M]



4.a) Explain (i) active power (ii) reactive power and (iii) apparent power. [5M]
b) Find the total current to the series circuit consisting of $L=0.25$ H and $C=50$ μ F with an applied voltage $v=200 \sin 314t$ volts. [5M]

OR

5. The equation of an alternating current is $i(t)=250 \sin(314t)$. Find (i) Maximum value [10M]
(ii) RMS value (iii) Average value (iv) Form factor (v) Peak factor.

6.a) Explain the working principle of a single-phase transformer. [6M]
b) A 200 kVA, 11000 V/ 400 V, 50 Hz single-phase transformer has 100 secondary turns. [4M]
Determine (i) the primary and secondary current, (ii) the number of primary turns, and (iii) the maximum value of the flux.

OR

7. Obtain the equivalent circuit of a transformer when referred to the primary from the fundamentals. [10M]

8.a) Derive an e.m.f. Equation of a d.c Generator. [5M]
b) What are the types of d.c generators? Explain. [5M]

OR

9. Explain the working of a d.c motor with a neat sketch. [10M]

10.a) Draw the torque-slip characteristics of a 3-phase Induction Motor. [6M]
b) A 3-phase, 50 Hz, 4-pole induction motor has a full load slip of 3 %. [4M]
Find (i) synchronous speed and (ii) motor speed.

OR

11. Explain the constructional details and working principle of a 3-phase synchronous generator with a neat sketch. [10M]
