B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025
Second Semester
Mechanical Engineering
20ESEE201 - ELECTRICAL TECHNOLOGY WITH LABORATORY
Regulations - 2020

Duration: 3 Hours   Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)
Answer ALL Questions

	Marks	K–Level	CO

1. The unit of resistivity is _____.   — 1, K1, CO1
   (a) Ω   (b) Ω - metre   (c) Ω / metre   (d) Ω / m²
2. Thevenin resistance Rth is found _____.   — 1, K1, CO1
   (a) By removing voltage sources along with their internal resistances
   (b) By short circuiting the given two terminals   (c) Between any two open terminals
   (d) Between same short terminals as for Eth
3. A transformer transforms _____.   — 1, K1, CO2
   (a) Voltage   (b) Power   (c) Current   (d) Frequency
4. If field current is decreased in a shunt dc motor, the speed of the motor   — 1, K1, CO2
   (a) remains the same   (b) increases   (c) decreases   (d) none of the above
5. In a synchronous motor, the magnitude of stator back EMF Eb depends on   — 1, K1, CO3
   (a) Speed   (b) Load   (c) Both speed and rotor flux   (d) DC excitation
6. Which of the following motor will give relatively high starting torque?   — 1, K1, CO3
   (a) Capacitor start motor   (b) Capacitor run motor
   (c) Split phase motor   (d) Shaded pole motor
7. Starters are used in dc motors because   — 1, K1, CO4
   (a) These motors have high starting torque   (b) These motors are not self-starting
   (c) Back e.m.f. of these motors is zero initially
   (d) To restrict armature current as there is no back e.m.f. while starting
8. Slip ring of an induction motor is usually made up of   — 1, K1, CO4
   (a) Aluminium   (b) Copper   (c) Phosphorus Bronze   (d) Carbon
9. _____ drive is also called as Line shaft drive.   — 1, K1, CO5
   (a) Individual drive   (b) Multimotor drive
   (c) Group Drive   (d) None of the above
10. An electric drive is required to operate in   — 1, K1, CO6
    (a) Three quadrants   (b) One quadrant   (c) Two quadrants   (d) Four quadrants

PART - B (12 × 2 = 24 Marks)
Answer ALL Questions

No.	Question	Marks	K-Level	CO
11.	State Ohm's law.	2	K2	CO1
12.	Define power factor.	2	K2	CO1
13.	Classify the different types of motors.	2	K1	CO2
14.	Write the torque equation of DC motor.	2	K1	CO2
15.	Why a single phase induction motor does not self-start?	2	K1	CO3
16.	Explain the principle of synchronous machine.	2	K2	CO3
17.	List out why the Starters necessary for starting DC Motors?	2	K1	CO4
18.	Compare squirrel cage and slip ring induction motor.	2	K2	CO4

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **14098**

19.	Name the basic elements of an electric drive system.	2	K1	CO5
20.	List out some advantages of electric drives.	2	K1	CO5
21.	State Kirchhoff's current law and voltage law.	2	K2	CO1
22.	Name types of electric drives.	2	K1	CO5

PART - C (6 × 11 = 66 Marks)
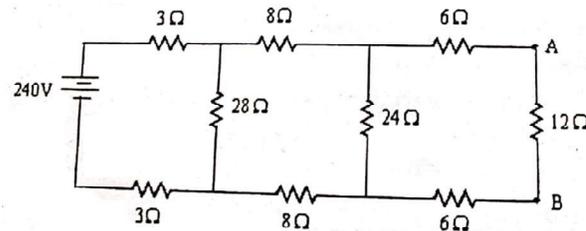### Answer ALL Questions

23. a) Show the voltage across the 4 Ω resistor using KVL. Also Find the power absorbed by the 2Ω resistors.   11 K2 CO1
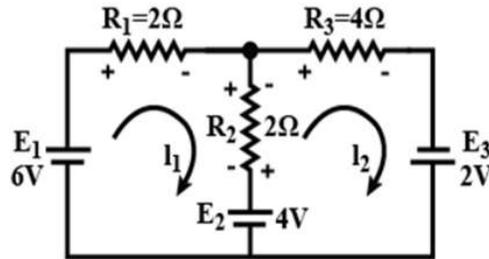
OR

   b) Interpret the current 12Ω resistor using Thevenin's theorem.   11 K2 CO1

24. a) Explain the construction, working principle and operation of a transformer.   11 K2 CO2

OR

   b) Illustrate the construction details of DC Motor with neat sketch.   11 K2 CO2

25. a) Draw a neat sketch showing the various parts of a synchronous machine. State the type of synchronous generator used in power stations.   11 K2 CO3

OR

   b) Explain the principle of operation of 3-phase induction motor and explain how the rotating magnetic field is produced.   11 K2 CO3

26. a) Why is a starter necessary for a DC motor? Explain the working of a three-point starter with the help of a neat diagram.   11 K2 CO4

OR

   b) Classify various methods of braking of DC shunt motors with neat diagrams.   11 K2 CO4

27. a) Develop the heating and cooling curves.   11 K3 CO5

OR

   b) Choose on classes of duty for an electric motor.   11 K3 CO5

28. a) Explain the construction and working principle of single phase induction motor.   11 K2 CO3

OR

   b) Interpret the factors influencing the choice of electrical drive.   11 K2 CO5