

## PRACTICE SET

**End Semester Examination, December, 2025**

**Program: B.Tech (MiE/CSE)**

**Subject: Basic Electrical Engineering**

**Subject Code: 8ESC101 / 3ESC101**

**Semester: I**

Course Outcomes	Descriptions
CO1	Demonstrate and apply basics of electrical circuit theorms on D.C Supply & A.C waveform with the Phasor diagram & power measurement.
CO2	Apply fundamentals of electromagnetism and basic concept of single-phase & three phase transformer with their regulation, efficiency and estimation of losses.
CO3	Understand the basic circuits converters, inverters, Switchgear protection, earthing & types of battery.
CO4	Realize the concept and working of different types of DC and AC machines and will be able to select right machine to meet desired needs for implementing engineering solutions.

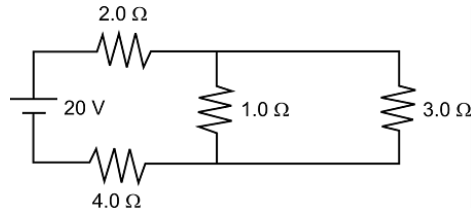
### UNIT 1

#### Section A (5 Marks)

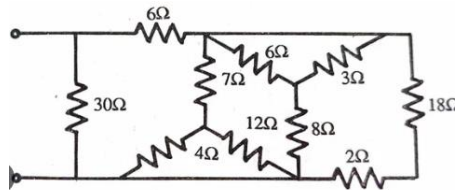
1. Define the following CO1 (Remember)
  - a) Electric circuit
  - b) Electric Network
  - c) Node
  - d) Junction
  - e) Branch
2. Classification of the following networks elements. CO1(Understand)
  - a) Active Elements and Passive Elements
  - b) Bilateral Elements and Unilateral Elements
3. State Kirchoff's Current law and Kirchoff's Voltage law. CO1 (Remember)
4. Explain the following terms. CO1 (Understand)
  - a) EMF
  - b) Resistance
  - c) Current
  - d) Voltage
  - e) Charge
5. State Ohm`s Law. What is the limitation of Ohm`s Law. CO1 (Understand)

#### Section B (10 marks)

6. A. State Norton's Theorem with example. CO1(Remember)  
 B. Derive the series and parallel connection of resistors. CO1( Apply)
7. Four resistances of 10  $\Omega$  each are connected in parallel form. Find the equivalent resistance of the circuit. CO1 (Evaluate)
8. Find the value of current flowing through each branch. CO1 (Evaluate)

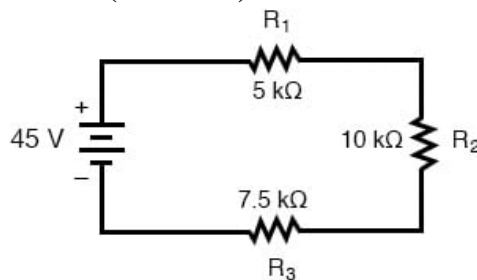


9. A. State Superposition Theorem with example. CO1(Remember)
- B. Derive the series and parallel connection of capacitors. CO1 (Apply)
10. Find the equivalent resistance of the following circuit. CO1 (Evaluate)

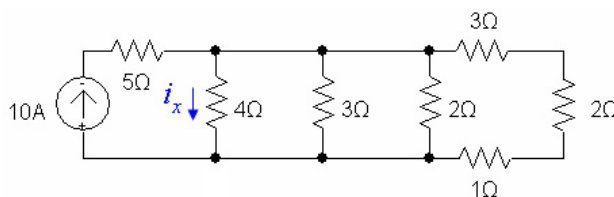


**Section C (20 Marks)**

11. A. Find the current flowing through the circuit below and also find the voltage drop across each resistance. CO1 (Evaluate)



- B. Find the value of current flowing through the 4 ohm resistor. CO1(Evaluate)



**UNIT 2**

**Section A (5 Marks)**

12. Explain the Average Value & RMS Value of the signal. CO2 (Understand)
13. Define Following: CO2 (Remember)
- i. Resonance of series RLC circuit.
  - ii. Q-factor series RLC circuit and parallel RLC circuit.
14. What do you understand by power factor of the circuit? CO2 (Understand)
15. Describe the term form factor and peak factor. CO2 (Understand)
16. Define the following: CO2 (Remember)
- a) True Power
  - b) Apparent Power

- c) Reactive Power
- d) Power Triangle
- e) Impedance triangle

**Section B (10 Marks)**

17. Describe the RLC series circuit combination with phasor diagram. CO2 (Understand)
18. Explain the concept of resonance in RLC series circuit. CO2 (Understand)

**Section C (20 Marks)**

19. Why is a three-phase supply system preferred over a single-phase supply for industrial applications? CO2 (Apply)
20. An R-L (resistive-inductive) series circuit is connected to a single-phase AC supply of voltage  $V = V_m \sin(\omega t)$ . Derive the expression for the current in the circuit and show how it lags behind the supply voltage. CO2 (Apply)

**UNIT 3**

**Section A (5 Marks)**

21. Distinguish between ideal and practical transformer. CO3 (Understand)
22. Write the construction and working of transformer. CO3 (Understand)

**Section C (20 Marks)**

23. Derive the EMF equation of a transformer and explain the meaning of each term in it. CO3 (Apply)
24. What do you understand by transformer? Can you explain the advantages and disadvantages in our practical life. CO3 (Understand)

**UNIT 4**

**Section A (5 Marks)**

25. Write down the difference between Generator and Motor. CO3 (Understand)
26. Write down the difference between AC Machine and DC Machine. CO3 (Understand)
27. Write the construction and working of synchronous Machine. CO3 (Understand)

**Section B (10 Marks)**

28. Describe the construction and working of 3-phase Induction Motor. CO3 (Apply)
29. The frequency of the emf in the stator of a 4-pole induction motor is 50 Hz and the rotor is 1.5 Hz. what is the slip and at what speed is the motor running? CO3 (Evaluate)
30. Discuss the differences between a squirrel-cage and a slip-ring induction motor with respect to industrial applications CO3 (Evaluate)

**Section C (20 Marks)**

31. Describe the constructional features of DC motor in details. Also write down the advantages and applications of DC Motor. CO3 (Apply)
32. Explain how a rotating magnetic field is produced in a three-phase stator winding. CO3 (Understand)

**UNIT 5**

**Section A (5 Marks)**

33. State Buck and Boost converter. CO4 (Understand)

**UNIT 6**

**Section A (5 Marks)**

34. Define Electric Fuse and its advantages and disadvantages. CO4 (Remember)
35. Discuss the following terms:  
A. MCCB    B. ELCB    C. MCB    CO4 (Remember)

36. Describe the construction of Electric Cables. CO4 (Understand)

**Section B (10 Marks)**

37. Write down the difference between fuse & Circuit Breakers. CO4 (Understand)

38. Define circuit breaker. Describe the different types of circuit breakers. CO4 (Remember)

**Section C (20 Marks)**

39. Can you describe about Earthing & necessity of Earthing in daily life. CO4 (Apply)

40. Can you differentiate and explain about wire & cable used in electrical engineering. CO4 (Apply)

**Summary Sheet:**

**CO Wise**

CO	Q. No.	Marks
CO1	1,2,3,4,5,6,7,8,9,10,11	95
CO2	12,13,14,15,16,17,18,19,20	85
CO3	21,22,23,24,25,26,27,28,29,30,31,32	135
CO4	33,34,35,36,37,38,39,40	80
<b>Total</b>		<b>395</b>

**Unit Wise**

Unit	Q. No.	Marks
Unit 1	1,2,3,4,5,6,7,8,9,10,11	95
Unit 2	12,13,14,15,16,17,18,19,20	85
Unit 3	21,22,23,24	50
Unit 4	25,26,27,28,29,30,31,32	85
Unit 5	33	5
Unit 6	34,35,36,37,38,39,40	75
<b>Total</b>		<b>395</b>

**Blooms Taxonomy Level (BTL) Wise**

BTL	Q. No.	Marks
LOT	1,2,3,4,5,9,12,13,14,15,16,21,22,25,26,33,34,35,36,37,38,39	
HOT	6,7,8,10,11,17,18,19,20,23,24,27,28,29,30,31,32,40	
<b>Total</b>		<b>395</b>

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**Disclaimer:** - This is a Practice Set. The Question in End term examination will differ from the Practice set. This Practice set is meant for practice only.