

3 SEM TDC ECNS (CBCS) SEC 3.1

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(Held in April–May, 2021)

PHYSICS

(Skill Enhancement Course)

Paper : SEC–3.1

(Electrical Circuits and Network Skill)

Full Marks : 40
Pass Marks : 16

Time : 2 hours

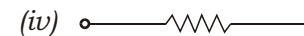
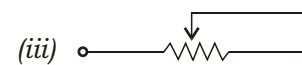
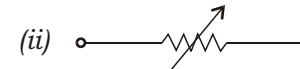
*The figures in the margin indicate full marks
for the questions*

1. Choose the correct answer : 1×4=4

(a) Which of the following bulbs has the highest filament resistance?

- (i) 220 V, 60 W
- (ii) 220 V, 100 W
- (iii) 115 V, 60 W
- (iv) 115 V, 100 W

(b) The electrical drawing symbol for a variable resistor is



(c) If the capacitor of a single-phase motor is short-circuited

- (i) the motor will run in same direction
- (ii) the motor will run in reverse direction
- (iii) the motor will not run
- (iv) None of the above

(d) Induction-type single-phase energy meters measure electric energy in

- (i) kW
- (ii) Wh
- (iii) kWh
- (iv) VAR

(3)

2. Answer the following questions : $2 \times 4 = 8$

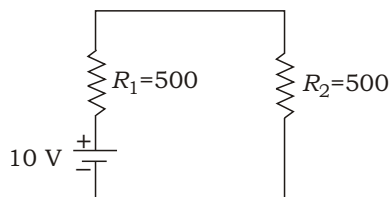
- (a) What is power factor of an AC circuit?
- (b) Find the equivalent capacitance of C_1 and C_2 connected in series.
- (c) What is phase reversal? How does it cause?
- (d) Write the differences between conductor and cables.

3. State Ohm's law. Explain how the value of a resistor can be measured with an analog multimeter. $1 + 2 = 3$

4. Explain briefly the rules to analyze DC sourced electrical circuits. 4

Or

Write the differences between single- and three-phase alternating current sources. Find out the voltage across the resistance R_1 from the following circuit : $2 + 2 = 4$



5. What is blueprint? Sketch the electrical drawing symbols of AC source, resistor, relay and transformer. $2 + 2 = 4$

(4)

6. Describe the construction and working of a DC generator with diagram. 4

Or

What is transformer? Discuss the working and construction of a transformer with diagram. $1 + 3 = 4$

7. Discuss the basic design and working of a DC motor. 4

Or

What are the differences between AC and DC motors? Discuss the factors on which the speed of motor depends on.

8. Explain the working of a half-wave rectifier with circuit diagram. 3

9. Discuss briefly the various protection devices of electrical circuit. 3

10. Convert a star network into delta network. 3

Or

Explain the procedure for preparation of extension board.
