

# CBSE Class 12 Electrical Technology 2024 - Set 343



## Question Paper

Conducted by the Central Board of Secondary Education (CBSE)

**Time Allowed: 3 Hours**

**Maximum Marks: 60**

### General Instructions

- (i) Please read the instructions carefully.
- (ii) This question paper consists of 24 questions in two Sections : Section A and Section B.
- (iii) Section A has Objective type questions whereas Section B contains Subjective type questions.
- (iv) Out of the given  $(6 + 18) = 24$  questions, a candidate has to answer  $(6 + 11) = 17$  questions in the allotted (maximum) time of 3 hours.
- (v) All questions of a particular section must be attempted in the correct order.
- (vi) Section A : Objective Type Questions (30 marks) : (a) This section has 6 questions. (b) There is no negative marking. (c) Do as per the instructions given. (d) Marks allotted are mentioned against each question/part.
- (vii) Section B : Subjective Type Questions (30 marks) : (a) This section has 18 questions. (b) A candidate has to do 11 questions. (c) Do as per the instructions given. (d) Marks allotted are mentioned against each question/part.

## Section A

1. Answer any 4 out of the given 6 questions on Employability Skills.  $4 \times 1 = 4$

1(i). Define listening.

1(ii). Define self-management skills.

1(iii). \_\_\_\_\_ is defined as the drive required to engage in goal-oriented behaviour.

1(iv). What is the intersection of a column and a row on a worksheet called ?

1(v). What is a start-up ?

1(vi). Green tourism makes optimal use of \_\_\_\_\_.

2. Answer any 5 out of the given 7 questions.  $5 \times 1 = 5$

2(i). In a series RLC circuit, L indicates :

- |                                |                               |
|--------------------------------|-------------------------------|
| (A) Current in the circuit     | (B) Inductance of the circuit |
| (C) Capacitance of the circuit | (D) Resistance of the circuit |

2(ii). An elementary transformer is fitted with :

- |               |               |
|---------------|---------------|
| (A) Soft iron | (B) Cast iron |
| (C) Copper    | (D) Silver    |

2(iii). Split-phase motor is also known as :

- |                               |                            |
|-------------------------------|----------------------------|
| (A) Shaded pole motor         | (B) Capacitor start motor  |
| (C) Permanent capacitor motor | (D) Resistance start motor |

2(iv). Which material bar is placed in each slot of squirrel cage rotor ?

- |               |               |
|---------------|---------------|
| (A) Cast iron | (B) Soft iron |
| (C) Copper    | (D) Steel     |

2(v). Induction type energy meter has \_\_\_\_\_ main parts.

- |          |           |
|----------|-----------|
| (A) Two  | (B) Three |
| (C) Five | (D) Four  |

2(vi). The outer vessel of electric geyser is made of :

- |                        |                        |
|------------------------|------------------------|
| (A) lead coated steel  | (B) lead coated iron   |
| (C) lead coated copper | (D) lead coated silver |

2(vii). During the testing of an appliance, if a lamp glows dimly it means :

- |                   |                  |
|-------------------|------------------|
| (A) Close circuit | (B) Open circuit |
| (C) Short circuit | (D) Earth fault  |

3. Answer any 6 out of the given 7 questions.  $6 \times 1 = 6$

3(i). What do you mean by period of a wave ?

3(ii). What is the full form of ONAF ?

3(iii). Write two mechanical faults of an AC motor.

3(iv). Name two main parts of a three-phase motor.

3(v). What is the function of a digital voltmeter ?

3(vi). On which principle does the water heater work ?

3(vii). What is the function of a thermostat ?

4. Answer any 5 out of the given 6 questions.  $5 \times 1 = 5$

Write True/False :

4(i). Transformer must be grounded before providing supply.

- |          |           |
|----------|-----------|
| (A) True | (B) False |
|----------|-----------|

**4(ii).** The speed of DC shunt motor increases linearly with increase of armature current.

- (A) True (B) False

**4(iii).** Starting torque of slip ring motor is low.

- (A) True (B) False

**4(iv).** Permanent magnet is used for reducing the rotation of aluminium disc.

- (A) True (B) False

**4(v).** Neutral wire should be connected to the switch.

- (A) True (B) False

**4(vi).** Carbon powder is used for extinguishing electrical fires.

- (A) True (B) False

**5.** Answer any 5 out of the given 6 questions.  
 $5 \times 1 = 5$

Fill in the blanks with the correct alternative given in brackets :

**5(i).** A transformer works on the principle of \_\_\_\_\_.

- (A) electromagnetic induction (B) Lenz law

**5(ii).** There is/are \_\_\_\_\_ main characteristic/s of a DC motor.

- (A) one (B) three

**5(iii).** \_\_\_\_\_ motors are used in industries.

- (A) 3-phase induction (B) single-phase induction

**5(iv).** The unit of a capacitor is \_\_\_\_\_.

- (A) watt (B) microfarad

**5(v).** The lower part of a mixer is made with \_\_\_\_\_.

- (A) plastic or ebonite (B) glass

**5(vi).** The corners of the tube of immersion rod are sealed with \_\_\_\_\_.

- (A) white compound (B) black compound

**6.** Answer any 5 out of the given 6 questions.  
 $5 \times 1 = 5$

**6(i).** What does  $E_b$  indicate in voltage equation  $V = E_b + I_a R_a$  ?

- (A) Input voltage (B) Back emf  
(C) Armature current (D) Armature resistance

**6(ii).** By which part of the DC motor can it be easily identified ?

- (A) Armature (B) Rotation  
(C) Slip ring (D) Commutator

**6(iii).** If the slip of the rotor is doubled, then the value of rotor reactance per phase will be :

- (A) halved (B) doubled  
(C) four times (D) unchanged

**6(iv).** What is the advantage of moving coil magnet type instrument ?

- (A) High hysteresis loss (B) Dumping efficiency  
(C) More power consumption (D) Uneven scale

**6(v).** Which single-phase motor works better with power factor ?

- (A) Capacitor start (B) Universal  
(C) Shaded pole (D) Capacitor run type

**6(vi).** What causes motor winding to burn ?

- (A) Open circuit of capacitor (B) Short circuit of capacitor  
(C) Change in capacitor (D) Earth fault

## Section B

Answer any 3 out of the given 5 questions on Employability Skills. Answer each question in 20 – 30 words.  $3 \times 2 = 6$

7. What is communication ?

8. Define Paranoid and Schizoid personality disorders.

9. Write the procedure of inserting clipart and images in a presentation.

10. Define entrepreneurial competencies.

11. What is the role of green jobs in toxin-free houses ?

Answer any 3 out of the given 5 questions in 20 – 30 words each.  $3 \times 2 = 6$

12. Draw a diagram showing capacitance in an AC circuit.

13. Write applications of a transformer.

14. What precautions must be taken while working on an electric mixer ?

15. Explain the possible faults of an immersion heater.

16. Explain the characteristics and applications of DC series motor.

Answer any 2 out of the given 3 questions in 30 – 50 words each.  $2 \times 3 = 6$

17. With the help of a connection diagram, differentiate between resistance induction motor and resistance start induction motor.

18. With the help of a diagram, explain the working of an auto-transformer.

19. Differentiate between squirrel cage and slip ring induction motor.

Answer any 3 out of the given 5 questions in 50 – 80 words each.  $3 \times 4 = 12$

20. Explain the basics of electrical safety.

21. With a diagram, explain the working of pressure type water heater.

22. What do you mean by DC motor ? Explain the construction of a DC motor.

23. With a diagram, explain the working of Star-Delta motor starter.

24. Explain the parts of a digital multimeter along with their functions.

- End of Question Paper -