

CBSE Class 12 Electrical Technology 2024 - Set 343/S - Compartment



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). _____ is a form of communication that allows students to put their feelings and ideas on paper.

1(ii). What is self-motivation ?

1(iii). _____ is a condition marked by an over-reliance on other people to meet one's emotional and physical needs.

1(iv). The software which contains rows and columns is called _____ .

- (A) Database (B) PowerPoint
(C) Spreadsheet (D) Word Processor

1(v). Write any two fears seen in an entrepreneur.

1(vi). The process of collecting rainwater and reusing the same in buildings is called _____ .

- (A) Wastewater Treatment (B) Water Recycling
(C) Rainwater Harvesting (D) Water Auditing

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

2(i). The shape of a rotor is :

- (A) square (B) cubic
(C) rectangle (D) cylinder

2(ii). 1 BHP =

- (A) 726 watts (B) 736 watts
(C) 746 watts (D) 756 watts

2(iii). What does I_a indicate in voltage equation $V = E_b + I_a R_a$?

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

2(iv). How many contactors does a Star Delta motor starter require ?

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

2(v). The continuity of an electrical circuit is checked by :

- (A) Ammeter (B) Voltmeter
(C) Ohm meter (D) Megger

2(vi). In a series RLC circuit, C indicates :

- (A) current in the circuit (B) inductance of the inductor
(C) capacitance of the capacitor (D) resistance of the resistor

2(vii). Which type of motor is used in a room cooler ?

- (A) Universal motor (B) Shaded pole motor
(C) Capacitor start or capacitor run motor (D) Repulsion motor

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

3(i). Define frequency.

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

3(iii). Name any two types of single-phase induction motors.

3(iv). What do you mean by squirrel cage induction motor ?

3(v). What is the use of induction type energy meter ?

3(vi). How will you perform earth fault test ?

3(vii). The upper bowl of electrical mixer is made of which material ?

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

Write true / false :

4(i). Always place transformer on a dry area.

(A) True (B) False

4(ii). Three-phase induction motor is used for domestic purposes.

(A) True (B) False

4(iii). Manual handling causes over a third of all workplace injuries.

(A) True (B) False

4(iv). DC series motor is applicable when high starting torque is required.

(A) True (B) False

4(v). The maintenance cost of slip ring motor is less as compared to squirrel cage motor.

(A) True (B) False

4(vi). The core of electromagnet is made of silicon steel lamination.

(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). Speed and torque characteristics of DC motor are known as _____ characteristics.

(A) mechanical (B) electrical

5(ii). Three-phase induction motor runs at constant speed from _____ to _____.

(A) full load, no load (B) no load, full load

5(iii). _____ fitting of the element in the geyser is more preferred.

(A) Vertical (B) Horizontal

5(iv). The lowest voltage to cause injury from an electric shock is _____.

(A) 30 V (B) 110 V

5(v). Shaded pole motors are made from _____.

(A) 1/25 HP to 1/6 HP (B) 2/25HP to 2/6 HP

5(vi). In digital multimeter, black lead is considered as _____ connection of circuit.

(A) positive (B) negative

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

6(i). The losses in an ideal transformer will be :

(A) zero (B) maximum
(C) minimum (D) negative

6(ii). The electrolytic capacitor is a short duty type and guaranteed for _____ operations per hour.

(A) 10 (B) 15
(C) 20 (D) 25

6(iii). The advantage of three-phase induction motor is :

(A) high price (B) easy to maintain
(C) low efficiency (D) bad power factor

6(iv). What is the function of diode ?

(A) To measure frequency (B) To store electrical charge
(C) To control direction of flow of current (D) To measure amount of AC voltage

6(v). Universal motor is used in :

(A) Hair dryer (B) Room cooler
(C) Lathe machine (D) Refrigerator

6(vi). What is CPR in first aid ?

(A) Care Personal Resident (B) Cardiopulmonary Resident
(C) Cardiopulmonary Resuscitation (D) Cardiopulse Resuscitation

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. How is active listening important for a worker ?

8. How can we influence personality ?

9. Enlist the steps to protect a spreadsheet with password.

10. What are the various organizational skills required to become a successful entrepreneur ?

11. Write some activities which are damaging our earth and environment.

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

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

13. Write the safety measure precautions of a transformer from an operational point of view.

14. Explain the characteristics and applications of DC compound motor.

15. Write the main components of an immersion heater.

16. What are the possible faults and their removal in an electric mixer ?

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

17. With the help of a diagram, explain the working of universal motors.

18. Why is starter necessary in DC motor ? Explain its working in brief.

19. With the help of a diagram, explain the basic construction and working principle of a transformer.

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

20. What can we do to help prevent manual handling injuries in the workplace ?

21. Explain the construction and the working principle of a room cooler. Draw a diagram of the internal structure of a room cooler.

22. Write the types, advantages and disadvantages of dynamometer wattmeter.

23. Explain the working principle of a three-phase induction motor with its advantages.

24. With the help of a diagram, explain the working principle of a capacitor start motor.

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