

CBSE Class 12 Electrical Technology 2023 - 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 (Objective Type Questions) (30 Marks)

Section A

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

1(i). What do you mean by presentation in a presentation software ?

1(ii). What is the shortcut key to print a text ?

1(iii). Which of the following is a subtype of emotional personality disorders ?

- | | |
|-------------------------------------|--------------------------------------|
| (A) Paranoid Personality Disorder | (B) Schizotypal Personality Disorder |
| (C) Histrionic Personality Disorder | (D) Schizoid Personality Disorder |

1(iv). How does self-motivation help us ?

1(v). _____ is a process of developing a business plan and running it using innovation to meet customer needs and make profit.

- | | |
|----------------------|----------------|
| (A) Entrepreneurship | (B) Profession |
| (C) Trade | (D) Occupation |

1(vi). Name one barrier to becoming an entrepreneur.

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

2(i). Construction of a universal motor is similar to :

- | | |
|----------------------------------|---------------------------------|
| (A) Single phase induction motor | (B) DC shunt motor |
| (C) DC series motor | (D) Three-phase induction motor |

2(ii). Power transformers are designed to have maximum efficiency at :

- | | |
|---------------|-----------------------|
| (A) No load | (B) Near to full load |
| (C) Half load | (D) Near to half load |

2(iii). In relation $F = BIL$, L indicates :

- | | |
|-------------|-------------------------|
| (A) Current | (B) Length of conductor |
| (C) Flux | (D) Force |

2(iv). Three-phase induction motor usually operates on :

- | | |
|-----------------|------------------|
| (A) 0.8 PF lags | (B) 0.8 PF leads |
| (C) Unity PF | (D) 0.6 PF leads |

2(v). Rotor of induction motor runs always :

- | | |
|---------------------------------|---------------------------------|
| (A) At synchronous speed | (B) In opposite direction |
| (C) More than synchronous speed | (D) Less than synchronous speed |

2(vi). Advantage of shaded pole motor is :

- | | |
|--------------------------|-------------------------|
| (A) No need of capacitor | (B) Low starting torque |
| (C) Low efficiency | (D) Low power factor |

2(vii). Thermostat is used in :

- | | |
|----------------------------|-------------------------------|
| (A) Ordinary electric iron | (B) Automatic electric geyser |
| (C) Immersion rod | (D) Room cooler |

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

3(i). Write any two methods of artificial respiration.

3(ii). What do you mean by AC motor ?

3(iii). Why is earthing necessary ?

3(iv). Name the method of heat transfer in electric iron.

3(v). Which instrument is used to measure AC supply voltage ?

3(vi). Name the things which are used to handle heavy loads.

3(vii). What do you mean by stator ?

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

(True/False)

4(i). For a given motor, synchronous speed is a function of supply frequency.

(A) True (B) False

4(ii). The speed of dc shunt motor falls very rapidly with increase in load.

(A) True (B) False

4(iii). Starting torque of capacitor start motor is less.

(A) True (B) False

4(iv). In induction motor, the rotor induces voltage, reactance and frequency all due to slip.

(A) True (B) False

4(v). The series motor has approximately constant speed.

(A) True (B) False

4(vi). Capacitor start and run motor has two permanent windings on rotor.

(A) True (B) False

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

Fill in the blanks.

5(i). If the speed of DC shunt motor increases, its back emf _____.

(A) increases (B) decreases

5(ii). The squirrel cage rotor are _____ types.

(A) open (B) closed

5(iii). Megger is used to measure _____.

(A) resistance (B) current

5(iv). The supply is connected to _____ winding of a transformer.

(A) secondary (B) primary

5(v). The meter which has high resistance is _____.

(A) ammeter (B) voltmeter

5(vi). _____ types of tools are preferred for use.

(A) Insolated (B) Non-insolated

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

6(i). Which cooling is required for 100 MVA transformer ?

(A) OFAF (B) ONAN
(C) OFAN (D) ONAF

6(ii). Name the liquid used in breather of transformer.

(A) Kerosene oil (B) Silica gel
(C) Coconut oil (D) Vegetable oil

6(iii). Example of permanent capacitor motor is :

(A) Hair Dryer (B) Electric Mixer
(C) Ceiling Fan (D) Drill Machine

6(iv). How many electrical degrees are in one cycle ?

(A) 180° (B) 90°
(C) 360° (D) 0°

6(v). On which law does pure resistive circuit in AC work ?

(A) Ohm's law (B) Lenz law
(C) Faraday law (D) Kirchhoff's law

6(vi). The wattmeter measures :

(A) Apparent power (B) True power
(C) Reactive power (D) Wattless power

Section B

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

7. What is a workbook ? Name any one spreadsheet application.

8. Write two roles of technical entrepreneurs.

9. What are the problems an entrepreneur may face while running a business ?

10. How do expensive thoughts motivate us ?

11. Give any two benefits of positive personality.

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

12. What is power factor in a series circuit ?

13. What are the advantages of Auto transformer ?

14. Give the reasons if motor blows out the fuse at the time of starting.

15. Write the name of any four AC single phase motor.

16. Write safety precautions while working on heavy loads.

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

17. What are the different types of transformer ? Explain the working of voltage transformer.

18. With diagram explain the working of split single phase induction motor.

19. With the help of a neat diagram, explain the construction of immersion rod.

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

20. Explain different kinds of faults which may occur in various domestic appliances.

21. With the help of diagram, explain the working of single phase induction type energy meter.

22. Compare the characteristics of squirrel cage motor and slip ring induction motor.

23. With the help of a diagram, explain the construction and working of pressure-type electric water geyser.

24. What is a DC motor ? Write its working principle and types.

- End of Question Paper -