

Class: XII

Subject: Power

Time: 2 Hrs. 30 Minutes

Max. Marks: 60

Name of the student:-----

Roll No:-----

General Instructions:

1. Please read the instructions carefully.
2. Marks allotted are mentioned against each section/question.
3. All questions must be attempted in the correct order.
4. This Question Paper consists of **34 questions** in **four sections – Section A, Section B, Section C & Section D.**
5. **Section A** has **Objective Answer Type Questions**
Section B contains **Very Short Answer Type Questions**
Section C contains **Short Answer Type Questions**
Section D contains **Essay Type Questions**
6. Out of the given 34 questions, a candidate has to answer **30 questions** in the allotted time of **150 minutes.**
7. All questions of a particular section must be attempted in the correct order.

1. SECTION A—OBJECTIVE TYPE QUESTIONS(15MARKS):

- i. This section has 15 questions.
- ii. There is no negative marking.
- iii. Do as per the instructions given.
- iv. Marks allotted are mentioned against each question/part.

2. SECTION B—VERY SHORT ANSWER TYPE QUESTIONS(12MARKS):

- i. This section contains 08 questions of 2 marks each.
- ii. A candidate has to do 06 questions.
- iii. Do as per the instructions given.
- iv. Marks allotted are mentioned against each question/part.

3. SECTION C—SHORT ANSWER TYPE QUESTIONS (18 MARKS):

- i. This section contains 08 questions of 3 marks each.
- ii. A candidate has to do 06 questions.
- iii. Do as per the instructions given.
- iv. Marks allotted are mentioned against each question/part.

4. SECTION D—ESSAY TYPE QUESTIONS (15 MARKS):

- i. This section contains 03 questions of 5 marks each.
- ii. A candidate has to do 03 questions.
- iii. Do as per the instructions given.
- iv. Marks allotted are mentioned against each question/part.

SECTION A - (OBJECTIVE TYPE QUESTIONS)

Answer the following questions (1x15 = 15 marks)

Q.1 The ohm's law deals with the relation between

- a) Charge and resistance
- b) Current and Potential Difference
- c) Charge and Capacity
- d) Capacity and Potential difference

Q.2 The unit of electrical energy is

- a) Watt-sec
- b) Joule
- c) KWh
- d) Newton

Q.3 Electrons which are loosely attached to the nucleus of an atom and can be easily detached are called

- a) Free Electrons
- b) Bonded Electrons
- c) Valence Electrons
- d) All of the above

Q.4 Three 3 ohm resistances are connected in the form of an equilateral triangle. The total resistance between any two corners is

- a) 2 Ohm
- b) 3 Ohm
- c) 6 Ohm
- d) $\frac{4}{3}$ Ohm

Q.5 Inductor is an

- a) Passive Component
- b) Active Component
- c) None of these
- d) Both a) and b)

Q.6 In rural areas, which type of feeder system is used?

- a) Radial
- b) Ring Main system
- c) Interconnected
- d) None of these

Q.7 The color of silica gel in a healthy transformer is

Q.8 ... is used as fuse element in transformer?

Q.9 ... should be taken before starting the work online?

Q.10 Write a few lines on fundamental safety tips?

Q.11 Write a short note on possible causes of accident?

Q.12 Write two rules of fire fighting?

Q.13 Assertion (A): The voltage regulation of a distribution transformer is kept as low as possible.

Reason (R): A low voltage regulation ensures minimal voltage drop during peak load.

Options:

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Q.14 Regular preventive maintenance is essential in 11/.4kV distribution substations.

Reason (R): Preventive maintenance helps in reducing the chances of sudden equipment failure.

Options:

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Q.15 Assertion (A): Radial distribution systems are more reliable than ring main systems.

Reason (R): Radial systems have multiple power sources feeding the same load.

Options:

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

SECTION B - (Very Short Answer Type Questions)

Answer any 6 out of the given 8 questions in 20–30 words each (2x6 = 12 marks)

Q.16 Explain Kirchhoff's Current Law and Kirchhoff's Voltage Law with practical application?

Q.17 A 100 watt, 200V lamp is operated at 100V. Calculate the power consumed by the lamp?

Q.18 Three electric lamps of 60W each are connected in parallel. Calculate the power consumed by the combination?

Q.19 Find the value of resistance having color band of Red-Red-Red-Gold using color coding method?

Q.20 What is the function of Buchholz Relay in distribution transformer?

Q.21 Explain the various types of distribution system?

Q.22 Write the function of any five personal protective equipment (PPE)?

Q.23 Write a short note on basic first aid? Why is it required?

SECTION C - (Short Answer Type Questions)

Answer any 6 out of the given 8 questions in 30–50 words each (3x6 = 18 marks)

Q.24 Explain general health and safety rules in power utility?

Q.25 List the safety precautions to be taken by distribution lineman?

Q.26

- a) Explain the various responsibilities and duties of distribution lineman?
- b) Explain the meaning of Hazards and Risks?

Q.27 Explain causes of failure of Transformer based on parameter given below:

- a. Overheating
- b. Damage of insulation
- c. Bushings

Q.28 Explain the maintenance and maintenance schedule of distribution transformer?

Q.29 What are the various reasons for the contamination of transformer oil?

Q.30

- a) Explain the difference between Voltmeter and Ammeter?
- b) Write a few lines on multimeter

Q.31 Explain the various factors on which the capacitance of a capacitor depends?

SECTION D - (Essay Type Questions)

Answer the following questions in 50–80 words each (3x5 = 15 marks)

Q.32 Explain any 3 methods of artificial respiration in detail?

Q.33

- a) Explain the various components of distribution transformer with neat and clean diagram?
- b) Explain the usage of various tools used for erection and maintenance of lines and distribution substation?

Q.34

- a) Explain the methods for the identification of transistors whether it is PNP or NPN?
- b) Explain the difference between half-wave and full-wave rectifier in terms of:
 - (i) Number of diodes used
 - (ii) Output of the rectifier
 - (iii) Efficiency
 - (iv) Ripple Factor
- c) How will you identify the terminals of semiconductor diode?