



## रेलवे भर्ती बोर्ड / RAILWAY RECRUITMENT BOARD

सीईएन नं. - 03/2024 / CEN No. - 03/2024



Test Date	22/04/2025
Test Time	9:00 AM - 11:00 AM
Subject	RRB JE Stage 2 Electrical and Allied Engineering

\* Note

Correct Answer will carry 1 mark per Question.

Incorrect Answer will carry 1/3 Negative mark per Question.

1. Options shown in green color with a tick icon are correct.

2. Chosen option on the right of the question indicates the option selected by the candidate.

### Section : General Abilities

Q.1	Which type of RAM is faster and DOES NOT require refreshing?
Ans	<input checked="" type="checkbox"/> 1. SRAM <input checked="" type="checkbox"/> 2. Flash Memory <input checked="" type="checkbox"/> 3. ROM <input checked="" type="checkbox"/> 4. DRAM
Q.2	The kinetic energy of an object is derived using which of the following equations of motion?
Ans	<input checked="" type="checkbox"/> 1. $s = ut + \frac{1}{2} at^2$ <input checked="" type="checkbox"/> 2. $a = (v - u) / t$ <input checked="" type="checkbox"/> 3. $v^2 - u^2 = 2as$ <input checked="" type="checkbox"/> 4. $v = u + at$
Q.3	Which of the following was NOT an artisan guild during the Mauryan period?
Ans	<input checked="" type="checkbox"/> 1. Potters <input checked="" type="checkbox"/> 2. Carpenters <input checked="" type="checkbox"/> 3. Bankers and Merchants <input checked="" type="checkbox"/> 4. Astrologers
Q.4	Which operating system is known for its open-source nature and community-driven development for desktops and laptops?
Ans	<input checked="" type="checkbox"/> 1. iOS <input checked="" type="checkbox"/> 2. Linux <input checked="" type="checkbox"/> 3. Windows <input checked="" type="checkbox"/> 4. macOS
Q.5	The main reason for which we are dependent on air is our ____.
Ans	<input checked="" type="checkbox"/> 1. respiration <input checked="" type="checkbox"/> 2. excretion <input checked="" type="checkbox"/> 3. digestion <input checked="" type="checkbox"/> 4. osmoregulation

Q.6	Which of the following elements has an atomic number of 8?
Ans	<input checked="" type="checkbox"/> 1. Nitrogen <input checked="" type="checkbox"/> 2. Oxygen <input checked="" type="checkbox"/> 3. Carbon <input checked="" type="checkbox"/> 4. Hydrogen
Q.7	What does LAN stand for?
Ans	<input checked="" type="checkbox"/> 1. Local Area Network <input checked="" type="checkbox"/> 2. Limited Access Node <input checked="" type="checkbox"/> 3. Linked Access Network <input checked="" type="checkbox"/> 4. Large Area Network
Q.8	A sound wave with a low frequency will have _____.
Ans	<input checked="" type="checkbox"/> 1. a low pitch <input checked="" type="checkbox"/> 2. a high pitch <input checked="" type="checkbox"/> 3. a short wavelength <input checked="" type="checkbox"/> 4. a low amplitude
Q.9	Which German optical technology firm inaugurated its first Global Capability Centre in Bengaluru in November 2024, with plans to double its workforce within three years?
Ans	<input checked="" type="checkbox"/> 1. Schneider Kreuznach <input checked="" type="checkbox"/> 2. Leica <input checked="" type="checkbox"/> 3. Jenoptik <input checked="" type="checkbox"/> 4. Carl Zeiss AG
Q.10	Who among the following developed the notation system for Hindustani classical music?
Ans	<input checked="" type="checkbox"/> 1. Pandit Vishnu Narayan Bhatkhande <input checked="" type="checkbox"/> 2. Ustad Amjad Ali Khan <input checked="" type="checkbox"/> 3. Ustad Bismillah Khan <input checked="" type="checkbox"/> 4. Pandit Ravi Shankar
Q.11	Who among the following Indian female cricketers won the Best International Cricketer Award (Women) at the BCCI Naman Awards 2025?
Ans	<input checked="" type="checkbox"/> 1. Mithali Raj <input checked="" type="checkbox"/> 2. Smriti Mandhana <input checked="" type="checkbox"/> 3. Harmanpreet Kaur <input checked="" type="checkbox"/> 4. Jhulan Goswami
Q.12	A ball of mass 50 grams is moving with a velocity of 15 m/s. What is its kinetic energy?
Ans	<input checked="" type="checkbox"/> 1. 5.625 J <input checked="" type="checkbox"/> 2. 3.750 J <input checked="" type="checkbox"/> 3. 1.875 J <input checked="" type="checkbox"/> 4. 7.500 J
Q.13	In an aquatic ecosystem, the phenomenon of biomagnification can best be studied in the case of _____.
Ans	<input checked="" type="checkbox"/> 1. chlorine <input checked="" type="checkbox"/> 2. phosphates <input checked="" type="checkbox"/> 3. organochlorine <input checked="" type="checkbox"/> 4. DDT

Q.14	An object is placed 15 cm in front of a convex lens of focal length 25 cm. The image distance will be _____.
Ans	<input checked="" type="checkbox"/> 1. 17.5 cm <input checked="" type="checkbox"/> 2. -9.37 cm <input checked="" type="checkbox"/> 3. -10.0 cm <input checked="" type="checkbox"/> 4. -37.5 cm
Q.15	Which function key is used to move text or graphics in a document?
Ans	<input checked="" type="checkbox"/> 1. F1 <input checked="" type="checkbox"/> 2. F5 <input checked="" type="checkbox"/> 3. F2 <input checked="" type="checkbox"/> 4. F12
Q.16	Which formula should be entered in cell C2 to multiply the values of cells A2 and B2 in Excel?
Ans	<input checked="" type="checkbox"/> 1. =A2+B2 <input checked="" type="checkbox"/> 2. =A2*B2 <input checked="" type="checkbox"/> 3. =MULTIPLY(A2,B2) <input checked="" type="checkbox"/> 4. =A2-B2
Q.17	The atomic mass of sulphur is 32 u, and sulphur exists as $S_8$ molecules. What is the molecular mass of sulphur?
Ans	<input checked="" type="checkbox"/> 1. 256 u <input checked="" type="checkbox"/> 2. 64 u <input checked="" type="checkbox"/> 3. 32 u <input checked="" type="checkbox"/> 4. 128 u
Q.18	Where can one find the option to change a PowerPoint template?
Ans	<input checked="" type="checkbox"/> 1. Design → Themes <input checked="" type="checkbox"/> 2. Home → Layout <input checked="" type="checkbox"/> 3. View → Slide Master <input checked="" type="checkbox"/> 4. Insert → Themes
Q.19	What happens to the pH of pure water when a few drops of lemon juice are added?
Ans	<input checked="" type="checkbox"/> 1. The pH remains the same <input checked="" type="checkbox"/> 2. The pH becomes neutral <input checked="" type="checkbox"/> 3. The pH decreases <input checked="" type="checkbox"/> 4. The pH increases
Q.20	Which of the following is NOT a source of collection of municipal solid waste?
Ans	<input checked="" type="checkbox"/> 1. Waste from hospitals <input checked="" type="checkbox"/> 2. Waste from schools <input checked="" type="checkbox"/> 3. Radioactive waste <input checked="" type="checkbox"/> 4. Waste from homes
Q.21	What is the primary function of a computer firewall?
Ans	<input checked="" type="checkbox"/> 1. To store user passwords securely <input checked="" type="checkbox"/> 2. To prevent unauthorised access to a private network <input checked="" type="checkbox"/> 3. To speed up internet connectivity <input checked="" type="checkbox"/> 4. To detect and remove computer viruses

**Q.22** Who among the following referred to the Directive Principles as the 'life-giving provisions' of the Constitution of India?

**Ans**  1. Ivor Jennings

2. LM Singhvi

3. BR Ambedkar

4. HM Seervai

**Q.23** The people of \_\_\_\_\_ were famously involved in execution of the Chipko movement.

**Ans**  1. Garhwal Himalayas

2. Assam

3. Gujarat

4. Delhi

**Q.24** Which of the following bridges is constructed over the Brahmaputra River in India?

**Ans**  1. Dholi-Sadiya Bridge

2. Howrah Bridge

3. Pamban Bridge

4. Mahatma Gandhi Setu

**Q.25** Which of the following correctly differentiates mixtures and compounds?

Feature	Mixture	Compound
A) Separation	Can be separated by physical methods	Requires chemical me
B) Composition	Fixed ratio	Variable ratio
C) Properties	Always the same as constituents	Different from constit
D) Formation	By chemical reaction	By simple mixing

**Ans**  1. Option B (Composition) is correct

2. Option A (Separation) is correct

3. Option D (Formation) is correct

4. Option C (Properties) is correct

**Q.26** A car moving at a constant speed of 123 km/hr along a straight road is an example of \_\_\_\_\_.

**Ans**  1. random motion

2. rotational motion

3. non-uniform motion

4. uniform motion

**Q.27** The President has the power to dissolve which house of Parliament?

**Ans**  1. Lok Sabha only

2. Legislative Assembly

3. Both Rajya Sabha and Lok Sabha

4. Rajya Sabha only

**Q.28** Electricity production is categorised under which of the following economic sectors?

**Ans**  1. Quaternary sector

2. Secondary sector

3. Primary sector

4. Tertiary sector

Q.29	Which country proposed the idea of holding a United Nations conference on human interactions with the environment in 1968?
Ans	<input checked="" type="checkbox"/> 1. Sweden <input checked="" type="checkbox"/> 2. Canada <input checked="" type="checkbox"/> 3. United States <input checked="" type="checkbox"/> 4. France
Q.30	A metal wire is stretched, but it does not break easily. This property is known as:
Ans	<input checked="" type="checkbox"/> 1. brittleness <input checked="" type="checkbox"/> 2. malleability <input checked="" type="checkbox"/> 3. hardness <input checked="" type="checkbox"/> 4. ductility
Q.31	The wavelength of ultraviolet radiations which is most powerful and causes damage to the DNA is _____.
Ans	<input checked="" type="checkbox"/> 1. UV-B <input checked="" type="checkbox"/> 2. UV-A <input checked="" type="checkbox"/> 3. UV-D <input checked="" type="checkbox"/> 4. UV-C
Q.32	Which of the following will increase the heat produced by a heating element?
Ans	<input checked="" type="checkbox"/> 1. Increasing the current flowing through the wire <input checked="" type="checkbox"/> 2. Using a material with high conductivity <input checked="" type="checkbox"/> 3. Using a wire of lower resistance <input checked="" type="checkbox"/> 4. Decreasing the applied voltage
Q.33	A solution is prepared by dissolving 40 g of NaCl in 200 g of water. What is the mass per cent of NaCl in the solution?
Ans	<input checked="" type="checkbox"/> 1. 20% <input checked="" type="checkbox"/> 2. 16.67% <input checked="" type="checkbox"/> 3. 4.45% <input checked="" type="checkbox"/> 4. 2.5%
Q.34	The power to issue an ordinance when Parliament is NOT in session is given to the President under which Article?
Ans	<input checked="" type="checkbox"/> 1. Article 356 <input checked="" type="checkbox"/> 2. Article 123 <input checked="" type="checkbox"/> 3. Article 110 <input checked="" type="checkbox"/> 4. Article 72
Q.35	What is the primary function of a firewall tool in a computer network?
Ans	<input checked="" type="checkbox"/> 1. To speed up internet connections <input checked="" type="checkbox"/> 2. To store data securely <input checked="" type="checkbox"/> 3. To detect and remove viruses <input checked="" type="checkbox"/> 4. To monitor and control incoming and outgoing network traffic

Q.36	Radiations that are emitted from nuclear wastes are known to cause _____ at a high rate.
Ans	<input checked="" type="checkbox"/> 1. mutations <input checked="" type="checkbox"/> 2. emotional defects <input checked="" type="checkbox"/> 3. syndromes <input checked="" type="checkbox"/> 4. diseases
Q.37	Which of the following options is NOT a greenhouse gas?
Ans	<input checked="" type="checkbox"/> 1. Carbon dioxide <input checked="" type="checkbox"/> 2. Nitrous oxide <input checked="" type="checkbox"/> 3. Methane <input checked="" type="checkbox"/> 4. Carbon tetrachloride
Q.38	A concave lens has a focal length of $-2$ cm. What is its power?
Ans	<input checked="" type="checkbox"/> 1. $25$ D <input checked="" type="checkbox"/> 2. $0.5$ D <input checked="" type="checkbox"/> 3. $-50$ D <input checked="" type="checkbox"/> 4. $-0.5$ D
Q.39	For the protection and improvement of the environmental quality, the Environment Protection Act came into force in the year _____.
Ans	<input checked="" type="checkbox"/> 1. 1986 <input checked="" type="checkbox"/> 2. 1992 <input checked="" type="checkbox"/> 3. 1972 <input checked="" type="checkbox"/> 4. 1984
Q.40	In which of the following events did Deepthi Jeevanji set a world record at the 2024 World Para Athletics Championships?
Ans	<input checked="" type="checkbox"/> 1. 600 metres T20 <input checked="" type="checkbox"/> 2. 200 metres T20 <input checked="" type="checkbox"/> 3. 100 metres T20 <input checked="" type="checkbox"/> 4. 400 metres T20
Q.41	Which of the following is NOT toxic to non-target organisms in the soil?
Ans	<input checked="" type="checkbox"/> 1. Fungicides <input checked="" type="checkbox"/> 2. Organic fertilisers <input checked="" type="checkbox"/> 3. Pesticides <input checked="" type="checkbox"/> 4. Herbicides
Q.42	What happens when you click on the 'Forward' button in an email?
Ans	<input checked="" type="checkbox"/> 1. The email is automatically sent to all contacts. <input checked="" type="checkbox"/> 2. A blank email opens. <input checked="" type="checkbox"/> 3. The email is permanently deleted. <input checked="" type="checkbox"/> 4. The original message is copied into a new email draft.
Q.43	Which of the following MS Excel functions is used to convert a numeric value into a text with a specific format?
Ans	<input checked="" type="checkbox"/> 1. VALUE() <input checked="" type="checkbox"/> 2. NUMBERTOTEXT() <input checked="" type="checkbox"/> 3. FORMAT() <input checked="" type="checkbox"/> 4. TEXT()

<b>Q.44</b>	Who is known as the leader of the Green Revolution in India?
<b>Ans</b>	<input checked="" type="checkbox"/> 1. C Subramaniam <input checked="" type="checkbox"/> 2. Prof. MS Swaminathan <input checked="" type="checkbox"/> 3. Tribhuvandas Kishibhai Patel <input checked="" type="checkbox"/> 4. Dr. Rajendra Prasad
<b>Q.45</b>	An alloy is considered a homogeneous mixture because:
<b>Ans</b>	<input checked="" type="checkbox"/> 1. it exhibits uniform composition throughout <input checked="" type="checkbox"/> 2. its components are chemically combined in fixed proportions <input checked="" type="checkbox"/> 3. its components can be separated by filtration <input checked="" type="checkbox"/> 4. it contains two or more phases
<b>Q.46</b>	Due to global warming, the temperature of the earth has increased by _____
<b>Ans</b>	<input checked="" type="checkbox"/> 1. 0.8°C <input checked="" type="checkbox"/> 2. 0.6°C <input checked="" type="checkbox"/> 3. 0.5°C <input checked="" type="checkbox"/> 4. 0.7°C
<b>Q.47</b>	What is the general orientation of the Himalayan ranges in the northwestern part of India?
<b>Ans</b>	<input checked="" type="checkbox"/> 1. East-South <input checked="" type="checkbox"/> 2. Northwest to Southeast <input checked="" type="checkbox"/> 3. Northeast to Southwest <input checked="" type="checkbox"/> 4. South-North
<b>Q.48</b>	Who among the following established the Bengal Chemical Swadeshi Stores?
<b>Ans</b>	<input checked="" type="checkbox"/> 1. Surendranath Banerjee <input checked="" type="checkbox"/> 2. Acharya PC Ray <input checked="" type="checkbox"/> 3. BG Tilak <input checked="" type="checkbox"/> 4. Dadabhai Naoroji
<b>Q.49</b>	Why do covalent compounds generally have low melting and boiling points?
<b>Ans</b>	<input checked="" type="checkbox"/> 1. They have a rigid lattice structure. <input checked="" type="checkbox"/> 2. They have weak intermolecular forces. <input checked="" type="checkbox"/> 3. They have strong electrostatic forces. <input checked="" type="checkbox"/> 4. They contain metallic bonds.
<b>Q.50</b>	In January 2025, India launched the NVS-02 satellite to strengthen which of the following navigation systems?
<b>Ans</b>	<input checked="" type="checkbox"/> 1. Global Positioning System (GPS) <input checked="" type="checkbox"/> 2. Global Navigation Satellite System (GLONASS) <input checked="" type="checkbox"/> 3. Navigation with Indian Constellation (NavIC) <input checked="" type="checkbox"/> 4. Galileo

Section : Technical Abilities

Q.1 In Shunt Zener diode voltage regulator circuit, the purpose of the resistor (R) connected in series with the input voltage is:

Ans  1. to filter out noise and ripples in the output voltage  
 2. to amplify the input voltage  
 3. to limit the current through the Zener diode  
 4. to add the input voltage and voltage drop across the resistor R and provide it to the Zener diode

Q.2 In arc heating, the arc is sustained by:

Ans  1. dielectric strength of air  
 2. magnetic field  
 3. ionisation of air  
 4. heat conduction

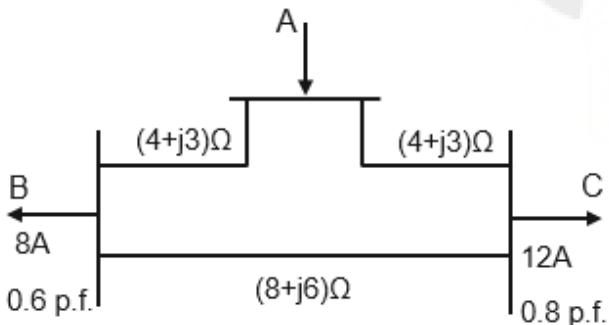
Q.3 The difference between Capacity Factor and Load Factor represents \_\_\_\_\_.

Ans  1. the total energy consumed by the plant  
 2. the plant's efficiency in converting fuel to electricity  
 3. the maximum demand of the plant  
 4. the plant's reserve capacity for future load growth

Q.4 Which of the following is characteristic of soft magnetic materials?

Ans  1. Large hysteresis loss  
 2. Low coercivity  
 3. Low relative permeability  
 4. Low absolute permeability

Q.5 Find the total current fed at the sending end A, in the given ring distributor ABC \_\_\_\_\_.



Ans  1.  $(13.6 + j14.4)$  A  
 2.  $(12 + j8)$   
 3.  $(14.4 + j13.6)$  A  
 4.  $(8 + j6)$  A

Q.6 Read the given Assertion (A) and Reason (R) carefully and select the correct option.

(A): Weakening of springs in PMMC is due to aging and temperature.  
(R): Permanent magnets used in PMMC instruments tend to lose their strength over time.

Ans  1. A is false, but R is true  
 2. Both A and R are true, but R is not the correct explanation of A.  
 3. A is true, but R is false.  
 4. Both A and R are true, and R is the correct explanation of A.

Q.7 With reference to energy band diagram of the NPN BJT, there exist \_\_\_\_\_ space charge regions and maximum band bending at \_\_\_\_\_ junction.

Ans  1. three; base collector

2. two; base emitter

3. three; base emitter

4. two; base collector

Q.8 The 'π (Pi) Model' or the 'T Model' is commonly used to represent which type of transmission line?

Ans  1. Medium transmission line (80 km to 160 km)

2. Long transmission line (more than 160 km)

3. Ultra-high voltage transmission line (above 1000 km)

4. Short transmission line (less than 80 km)

Q.9 Why are short-pitch windings preferred in alternators despite their lower induced EMF per coil?

Ans  1. They eliminate the need for insulation.

2. They increase the length of end connections.

3. They allow for higher voltage ratings.

4. They increase the overall efficiency.

Q.10 In a Star-Delta Starter used for induction motors, the starting torque is reduced to approximately:

Ans  1. 33% of full-load torque

2. 66% of full-load torque

3. 50% of full-load torque

4. 75% of full-load torque

Q.11 Microwave heating is based on the principle of:

Ans  1. conduction heating

2. dielectric heating

3. induction heating

4. arc heating

Q.12 Which of the following is a key characteristic of a slip ring induction motor?

Ans  1. High efficiency at all loads

2. Low starting torque and high starting current

3. Operates only at synchronous speed

4. High starting torque and low starting current

Q.13 What is the primary purpose of estimation and costing in unit earthing for commercial installations?

Ans  1. To eliminate the need for earthing in electrical systems

2. To determine the materials, labour and costs required for a safe and effective earthing system

3. To ensure the earthing system is aesthetically pleasing

4. To focus only on the decorative aspects of the installation

Q.14	Consider a fixed bias circuit using a NPN BJT transistor in CE configuration along with base resistance $R_b$ , collector resistance $R_c$ and supply voltage $V_{cc}$ . If $\beta$ is the current gain of the BJT, then the stability factor of the fixed bias circuit is:
Ans	<p><input checked="" type="checkbox"/> 1. inversely proportional to <math>\beta</math></p> <p><input checked="" type="checkbox"/> 2. independent of <math>\beta</math></p> <p><input checked="" type="checkbox"/> 3. directly proportional to <math>\beta</math></p> <p><input checked="" type="checkbox"/> 4. inversely proportional to square of <math>\beta</math></p>
Q.15	What is the primary purpose of 'Inter-Turn Fault Protection' in an alternator?
Ans	<p><input checked="" type="checkbox"/> 1. To detect faults between the rotor and stator windings</p> <p><input checked="" type="checkbox"/> 2. To monitor the voltage imbalance in the alternator</p> <p><input checked="" type="checkbox"/> 3. To protect against earth faults in the rotor winding</p> <p><input checked="" type="checkbox"/> 4. To detect faults between adjacent turns of the stator winding</p>
Q.16	The direction of the induced EMF in a coil may be found with the help of:
Ans	<p><input checked="" type="checkbox"/> 1. Fleming's right-hand rule</p> <p><input checked="" type="checkbox"/> 2. Fleming's left-hand rule</p> <p><input checked="" type="checkbox"/> 3. Steinmetz's law</p> <p><input checked="" type="checkbox"/> 4. Faraday's law</p>
Q.17	In a synchronous motor, If the load angle exceeds $90^\circ$ , then the motor will:
Ans	<p><input checked="" type="checkbox"/> 1. lose synchronism and stall</p> <p><input checked="" type="checkbox"/> 2. reduce copper losses</p> <p><input checked="" type="checkbox"/> 3. increase efficiency</p> <p><input checked="" type="checkbox"/> 4. operate at leading power factor</p>
Q.18	What is the role of heliostats in a power tower system?
Ans	<p><input checked="" type="checkbox"/> 1. To store solar energy for later use</p> <p><input checked="" type="checkbox"/> 2. To convert thermal energy into electrical energy</p> <p><input checked="" type="checkbox"/> 3. To track the Sun and direct sunlight to the receiver</p> <p><input checked="" type="checkbox"/> 4. To generate electricity directly</p>
Q.19	What law explains the induction of eddy currents in the armature core?
Ans	<p><input checked="" type="checkbox"/> 1. Lenz's Law</p> <p><input checked="" type="checkbox"/> 2. Faraday's Law</p> <p><input checked="" type="checkbox"/> 3. Ohm's Law</p> <p><input checked="" type="checkbox"/> 4. Ampere's Law</p>
Q.20	In an auto transformer, if the voltage transformation ratio is $2 : 1$ , what is the ratio of the primary current to the secondary current?
Ans	<p><input checked="" type="checkbox"/> 1. <math>2 : 1</math></p> <p><input checked="" type="checkbox"/> 2. <math>1 : 2</math></p> <p><input checked="" type="checkbox"/> 3. <math>1 : 1</math></p> <p><input checked="" type="checkbox"/> 4. <math>2 : 3</math></p>
Q.21	What is the purpose of '100% Stator Earth Fault Protection' in an alternator?
Ans	<p><input checked="" type="checkbox"/> 1. To monitor the voltage regulation of the alternator</p> <p><input checked="" type="checkbox"/> 2. To detect and protect against earth faults occurring anywhere in the stator winding</p> <p><input checked="" type="checkbox"/> 3. To detect and protect against phase-to-phase faults in the stator winding</p> <p><input checked="" type="checkbox"/> 4. To protect the rotor winding from overheating</p>

**Q.22** Which of the following statements is NOT correct regarding the errors in a Potential Transformer?

**Ans**

- 1. Both Power angle error and Ratio error influence Power measurement.
- 2. Both Power angle error and Ratio error are important for measuring Voltage.
- 3. Power angle error alone affects Voltage measurement in a Potential Transformer.
- 4. Voltage measurement in a Potential Transformer depends primarily on Ratio error.

**Q.23** In the torque-load characteristic curve of a DC series motor, what happens as the load increases?

**Ans**

- 1. The torque becomes constant.
- 2. The torque decreases proportionally.
- 3. The torque increases proportionally to the square of the armature current.
- 4. The armature current decreases.

**Q.24** Fleming's Right-Hand Rule is used to determine the direction of:

**Ans**

- 1. magnetic field around a conductor
- 2. the induced electromotive force
- 3. force on a charged particle
- 4. current flowing through a conductor

**Q.25** In j-notation, used in phasor representation, the imaginary unit  $j^2$  represents \_\_\_\_.

**Ans**

- 1.  $-1$
- 2.  $\sqrt{-1}$
- 3. 1
- 4. 0

**Q.26** A power system with a high reactive power demand will result in \_\_\_\_.

**Ans**

- 1. high power factor
- 2. no change in power factor
- 3. unity power factor
- 4. low power factor

**Q.27** Which factor does NOT affect the starting torque of an induction start synchronous motor?

**Ans**

- 1. Field excitation during startup
- 2. Rotor reactance
- 3. Rotor resistance
- 4. Supply voltage

**Q.28** In a power triangle, what is the relationship between active power (P), reactive power (Q) and apparent power (S)?

**Ans**

- 1.  $Q^2 = S^2 + P^2$
- 2.  $P^2 = S^2 + Q^2$
- 3.  $S = P + Q$
- 4.  $S^2 = P^2 + Q^2$

**Q.29** In a series RLC circuit, the total impedance is minimum when \_\_\_\_.

**Ans**

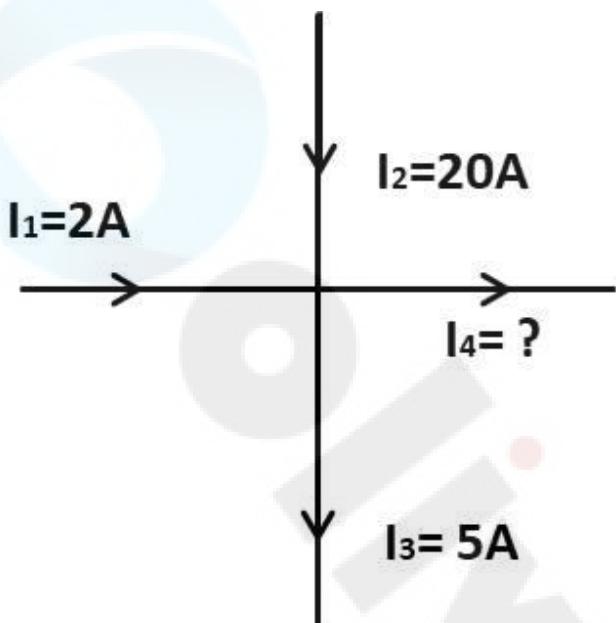
- 1.  $X_L < X_C$
- 2.  $X_L > X_C$
- 3. the resistance is zero
- 4.  $X_L = X_C$

Q.30	What is the main drawback of using an induction generator in a grid-connected wind turbine?
Ans	<p><input checked="" type="checkbox"/> 1. It is not suitable for wind energy applications.</p> <p><input checked="" type="checkbox"/> 2. It cannot generate active power.</p> <p><input checked="" type="checkbox"/> 3. It requires external reactive power from the grid.</p> <p><input checked="" type="checkbox"/> 4. It cannot operate at high speeds.</p>
Q.31	In a three-phase induction motor which component represents mechanical load in the equivalent circuit?
Ans	<p><input checked="" type="checkbox"/> 1. <math>R_2(1 - s)</math></p> <p><input checked="" type="checkbox"/> 2. <math>\frac{R_2(1 - s)}{s}</math></p> <p><input checked="" type="checkbox"/> 3. <math>\frac{sR_2(1 - s)}{s}</math></p> <p><input checked="" type="checkbox"/> 4. <math>\frac{R_2}{s}</math></p>
Q.32	In a three-phase star-connected system with a neutral shift, how can the problem be corrected?
Ans	<p><input checked="" type="checkbox"/> 1. By increasing the phase voltage</p> <p><input checked="" type="checkbox"/> 2. By increasing the neutral wire resistance</p> <p><input checked="" type="checkbox"/> 3. By disconnecting the neutral wire</p> <p><input checked="" type="checkbox"/> 4. By balancing the load among the three phases</p>
Q.33	<p>Read the given Assertion (A) and Reason (R) carefully and select the correct option.</p> <p>(A): The burden of an instrument transformer is usually expressed in volt-amperes (VA).</p> <p>(R): Burden is the total impedance of the connected devices, including meters, relays, and wiring.</p>
Ans	<p><input checked="" type="checkbox"/> 1. Both A and R are true and R is the not the correct explanation of A.</p> <p><input checked="" type="checkbox"/> 2. A is false, but R is true.</p> <p><input checked="" type="checkbox"/> 3. A is true, but R is false.</p> <p><input checked="" type="checkbox"/> 4. Both A and R are true and R is the correct explanation of A.</p>
Q.34	What is the first step in the design procedure for electrical installations in commercial buildings?
Ans	<p><input checked="" type="checkbox"/> 1. Conducting a load analysis to determine power requirements</p> <p><input checked="" type="checkbox"/> 2. Installing protective devices without planning</p> <p><input checked="" type="checkbox"/> 3. Selecting decorative lighting fixtures</p> <p><input checked="" type="checkbox"/> 4. Ignoring safety standards to reduce costs</p>
Q.35	Which connection method is correct when using a CT and PT with a wattmeter?
Ans	<p><input checked="" type="checkbox"/> 1. CT is connected in series with the wattmeter current coil, and PT is connected in parallel with the voltage coil.</p> <p><input checked="" type="checkbox"/> 2. CT is connected in parallel with the wattmeter current coil, and PT is connected in series with the voltage coil.</p> <p><input checked="" type="checkbox"/> 3. Both CT and PT are connected in series with the wattmeter.</p> <p><input checked="" type="checkbox"/> 4. Both CT and PT are connected in parallel with the wattmeter.</p>

Q.36 When armature conductors carry a lower load current, the armature's MMF (magnetomotive force) causes:

Ans  1. no effect on the main field flux  
 2. the main field flux to strengthen  
 3. an increase in the induced emf  
 4. a cross-magnetising effect

Q.37 Find the current  $I_4$  flowing in the circuit shown below.



Ans  1. 13 A  
 2. 23 A  
 3. 17 A  
 4. 27 A

Q.38 Winding in wire wound resistor is made up of \_\_\_\_\_.

Ans  1. Carbon  
 2. Chromium cobalt  
 3. Nickel  
 4. Nickel-chromium alloy

Q.39 The luminous intensity of a source emitting light uniformly in all directions of 10 lumens per steradian is:

Ans  1. 1 candela  
 2. 5 candela  
 3. 10 candela  
 4. 20 candela

Q.40 Shaded pole motors are ideal for \_\_\_\_\_.

Ans  1. low-power, continuous-duty applications  
 2. intermittent heavy-load tasks  
 3. high-vibration environments  
 4. precision speed control

Q.41 For a P-N junction diode, as the temperature increases the forward knee voltage of the diode \_\_\_\_\_ and the reverse saturation current \_\_\_\_\_.

Ans  1. decreases; decreases  
 2. increases; decreases  
 3. increases; increases  
 4. decreases; increases

Q.42 If laplace transform of voltage across capacitor of value 0.5 F is  $V_c(s) = \frac{1}{s^2 + 1}$ , the value of current through capacitor at  $t = 0^+$  will be:

Ans  1. 1 A  
 2. 0.5 A  
 3. zero  
 4. 2 A

Q.43 Coefficient of coupling between two coils is given as \_\_\_\_\_, where M = Mutual Inductance,  $L_1$  = Self Inductance of coil 1 and  $L_2$  = Self Inductance of coil 2

Ans  1.  $\frac{M}{\sqrt{L_1 L_2}}$   
 2.  $\frac{\sqrt{L_1 L_2}}{M}$   
 3.  $M \sqrt{L_1 L_2}$   
 4.  $L_1 \cdot L_2 \cdot M$

Q.44 Which of the following components is responsible for atomising the fuel in a diesel engine?

Ans  1. Turbocharger  
 2. Carburetor  
 3. Fuel pump  
 4. Injector

Q.45 Identify the correct statement related to switching speed of the BJT.

Ans  1. Switching speed of BJT is greater than switching speed on a MOSFET.  
 2. Switching speed of BJT is equal to switching speed on a MOSFET.  
 3. Switching speed of BJT is less compared to switching speed on a MOSFET.  
 4. BJT is an amplifying device and hence cannot work as a switch. Therefore, switching speed parameter does not exist for a BJT.

Q.46 The eddy current loss in a transformer is caused by:

Ans  1. resistance of the primary winding  
 2. voltage drop across the windings  
 3. saturation of the core material  
 4. circulating currents within the core due to changing magnetic flux

**Q.47** A  $0.5\Omega$  shunt resistor is used to measure current with a CRO. If the measured voltage drop is 5V, what is the current?

**Ans**  1. 2.5 A

2. 10 A

3. 5 A

4. 20 A

**Q.48** Electric Arc Welding is a type of:

**Ans**  1. resistance welding

2. fusion welding

3. solid-state welding

4. pressure welding

**Q.49** Which of the following best describes the role of cogeneration in energy conservation and how the application of a tariff system can help reduce energy bills?

**Ans**  1. Cogeneration is only applicable in large industrial settings and has no impact on energy conservation, while tariff systems are solely used for revenue generation by utilities.

2. Cogeneration and tariff systems are unrelated concepts, and neither contributes to energy conservation or cost reduction.

3. Cogeneration increases energy consumption by producing excess electricity, and tariff systems are used to penalize high energy users without reducing bills.

4. Cogeneration reduces energy waste by simultaneously producing electricity and useful thermal energy, while a well-designed tariff system incentivizes off-peak energy usage, lowering overall costs.

**Q.50** Which of the following materials should NOT be placed in a microwave oven?

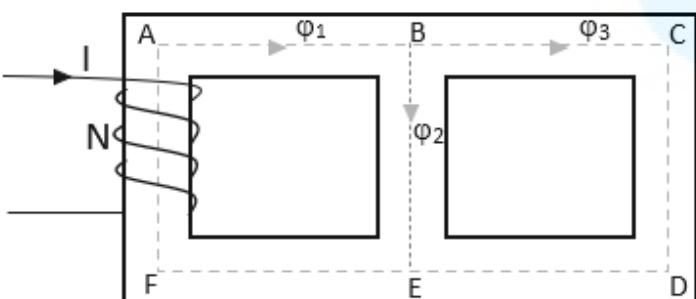
**Ans**  1. Paper

2. Aluminium foil

3. Glass

4. Plastic

**Q.51** Two magnetic paths BE and BCDE are in parallel and form a parallel magnetic circuit, as shown in the given figure. The Ampere Turn required for this parallel circuit is equal to:



**Ans**  1. inverse of Ampere Turn required for BE

2. ampere Turn required for any one of the paths

3. square of Ampere Turn required for any one of the paths

4. sum of Ampere Turn required for BE and BCDE

**Q.52** Which of the following is a common internal fault in transformers?

**Ans**  1. High power factor leading to overheating

2. Excessive cooling system efficiency

3. Overvoltage due to lightning strikes

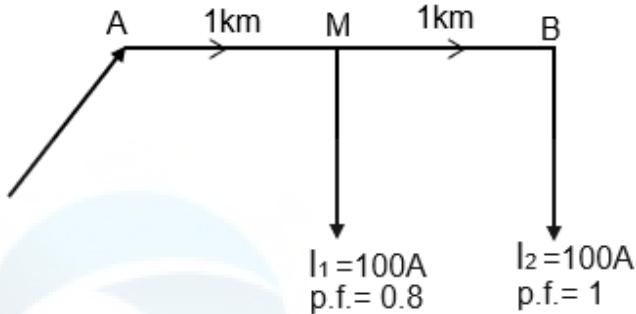
4. Winding inter-turn short circuits

Q.53	Which of the following statements regarding active power in AC circuits is INCORRECT?
Ans	<p><input checked="" type="checkbox"/> 1. Active power increases with an increase in power factor.</p> <p><input checked="" type="checkbox"/> 2. Active power is the real power consumed by the circuit.</p> <p><input checked="" type="checkbox"/> 3. Active power is given by <math>P=VI\sin\phi</math> in an AC circuit.</p> <p><input checked="" type="checkbox"/> 4. The unit of active power is Watt (W).</p>
Q.54	Which type of transformer is best suited for applications that require a low leakage reactance?
Ans	<p><input checked="" type="checkbox"/> 1. Ring type transformer</p> <p><input checked="" type="checkbox"/> 2. Core type transformer</p> <p><input checked="" type="checkbox"/> 3. Shell type transformer</p> <p><input checked="" type="checkbox"/> 4. Laminated type transformer</p>
Q.55	For simple fixed bias BJT in common emitter configuration using NPN transistor, base resistance $R_b$ , collector resistance $R_c$ and supply voltage $V_{cc}$ , the base current _____ with increase in $R_b$ and the emitter current _____.
Ans	<p><input checked="" type="checkbox"/> 1. decreases; increases</p> <p><input checked="" type="checkbox"/> 2. increases; increases</p> <p><input checked="" type="checkbox"/> 3. decreases; decreases</p> <p><input checked="" type="checkbox"/> 4. increases; decreases</p>
Q.56	Which of the following is the commonly used generator in a DC welding machine?
Ans	<p><input checked="" type="checkbox"/> 1. Shunt generator</p> <p><input checked="" type="checkbox"/> 2. Permanent magnet generator</p> <p><input checked="" type="checkbox"/> 3. Compound generator</p> <p><input checked="" type="checkbox"/> 4. Series generator</p>
Q.57	The relation between absolute permeability, $\mu$ and relative permeability $\mu_r$ of a material is given by: (Given $\mu_0$ is absolute permeability of air)
Ans	<p><input checked="" type="checkbox"/> 1. <math>\mu_0 = \frac{\mu_r}{\mu}</math></p> <p><input checked="" type="checkbox"/> 2. <math>\mu_r = \frac{\mu}{\mu_0}</math></p> <p><input checked="" type="checkbox"/> 3. <math>\mu = \frac{\mu_0}{\mu_r}</math></p> <p><input checked="" type="checkbox"/> 4. <math>\mu = \mu_r</math></p>
Q.58	If the quality factor (Q) of a resonant series circuit increases, then what happens to the voltage magnification?
Ans	<p><input checked="" type="checkbox"/> 1. It remains the same because supply voltage is constant.</p> <p><input checked="" type="checkbox"/> 2. It increases because energy losses decrease.</p> <p><input checked="" type="checkbox"/> 3. It becomes zero because resonance cancels the reactance.</p> <p><input checked="" type="checkbox"/> 4. It decreases because resistance increases.</p>
Q.59	Universal motors exhibit high starting torque due to _____.
Ans	<p><input checked="" type="checkbox"/> 1. series connection of stator and rotor windings</p> <p><input checked="" type="checkbox"/> 2. permanent magnet stators</p> <p><input checked="" type="checkbox"/> 3. shunt winding configuration</p> <p><input checked="" type="checkbox"/> 4. use of squirrel-cage rotors</p>

Q.60	How does the starting torque of a split-phase motor compare with that of a shaded-pole motor?
Ans	<p><input checked="" type="checkbox"/> 1. Both have similar starting torque.</p> <p><input checked="" type="checkbox"/> 2. Split-phase motors have higher starting torque.</p> <p><input checked="" type="checkbox"/> 3. Split-phase motors have no starting torque.</p> <p><input checked="" type="checkbox"/> 4. Shaded-pole motors have higher starting torque.</p>
Q.61	In a biomass power plant, what is the main purpose of the combustion/gasification chamber?
Ans	<p><input checked="" type="checkbox"/> 1. To cool down the system after power generation</p> <p><input checked="" type="checkbox"/> 2. To store biomass for future use</p> <p><input checked="" type="checkbox"/> 3. To burn biomass or convert it into syngas for energy generation</p> <p><input checked="" type="checkbox"/> 4. To distribute electricity to the grid</p>
Q.62	A composite magnetic circuit consisting of three different magnetic material of different permeability are joined in the form of a ring. The total reluctance is:
Ans	<p><input checked="" type="checkbox"/> 1. the sum of individual reluctances.</p> <p><input checked="" type="checkbox"/> 2. thrice the reluctance of material 1</p> <p><input checked="" type="checkbox"/> 3. the product of individual reluctances</p> <p><input checked="" type="checkbox"/> 4. inverse of the sum of individual reluctances</p>
Q.63	Why is an electrodynamometer-type wattmeter used as a standard instrument in laboratories?
Ans	<p><input checked="" type="checkbox"/> 1. It works only for low-power circuits.</p> <p><input checked="" type="checkbox"/> 2. It has high accuracy and precision.</p> <p><input checked="" type="checkbox"/> 3. It is cheaper than other wattmeters.</p> <p><input checked="" type="checkbox"/> 4. It requires no external power supply.</p>
Q.64	Why does Kelvin's Law give different conductor sizes for two identical systems?
Ans	<p><input checked="" type="checkbox"/> 1. Because the electrical load is different in both systems</p> <p><input checked="" type="checkbox"/> 2. Due to variations in interest rates, depreciation, and energy costs</p> <p><input checked="" type="checkbox"/> 3. Because one system uses overhead lines and the other uses underground cables</p> <p><input checked="" type="checkbox"/> 4. Because the resistance of conductors is always changing</p>
Q.65	Magnetic fringing can be minimised by:
Ans	<p><input checked="" type="checkbox"/> 1. scattering the magnetic flux</p> <p><input checked="" type="checkbox"/> 2. decreasing the temperature</p> <p><input checked="" type="checkbox"/> 3. using low quality magnetic material</p> <p><input checked="" type="checkbox"/> 4. reducing the air gap</p>
Q.66	Calculate the potential difference of an energy source that provides 6.8 J for every milli-coulomb of charge that it delivers.
Ans	<p><input checked="" type="checkbox"/> 1. 6.8 mV</p> <p><input checked="" type="checkbox"/> 2. 6.8 kV</p> <p><input checked="" type="checkbox"/> 3. 6.8 V</p> <p><input checked="" type="checkbox"/> 4. 0.68 V</p>

Q.67	Which of the following is NOT a condition for the parallel operation of transformers?
Ans	<p><input checked="" type="checkbox"/> 1. Same per unit impedance</p> <p><input checked="" type="checkbox"/> 2. Same voltage ratio</p> <p><input checked="" type="checkbox"/> 3. Same core material</p> <p><input checked="" type="checkbox"/> 4. Same polarity</p>
Q.68	The total collector current for a BJT operating in the active region is given by the relation _____ and the leakage current component is _____.
Ans	<p><input checked="" type="checkbox"/> 1. <math>I_c = I_{co}(\text{minority})</math>; majority carrier component</p> <p><input checked="" type="checkbox"/> 2. <math>I_c = I_c(\text{majority}) + I_{co}(\text{minority})</math>; majority carrier component</p> <p><input checked="" type="checkbox"/> 3. <math>I_c = I_c(\text{majority})</math>; minority carrier component</p> <p><input checked="" type="checkbox"/> 4. <math>I_c = I_c(\text{majority}) + I_{co}(\text{minority})</math>; minority carrier component</p>
Q.69	What is a key factor in the installation and costing of electrical systems for commercial buildings?
Ans	<p><input checked="" type="checkbox"/> 1. Ignoring safety standards to reduce costs</p> <p><input checked="" type="checkbox"/> 2. Ensuring compliance with electrical codes and standards while estimating materials and labour costs</p> <p><input checked="" type="checkbox"/> 3. Focusing only on decorative lighting and aesthetics</p> <p><input checked="" type="checkbox"/> 4. Eliminating the use of protective devices</p>
Q.70	Which of the following is a commonly used light source in modern street light installations?
Ans	<p><input checked="" type="checkbox"/> 1. Fluorescent tubes</p> <p><input checked="" type="checkbox"/> 2. Candles</p> <p><input checked="" type="checkbox"/> 3. Incandescent bulbs</p> <p><input checked="" type="checkbox"/> 4. High-Pressure Sodium (HPS) lamps</p>
Q.71	Which of the following is NOT an advantage of a PMMC instrument?
Ans	<p><input checked="" type="checkbox"/> 1. Suitable for AC and DC measurements</p> <p><input checked="" type="checkbox"/> 2. Linear scale</p> <p><input checked="" type="checkbox"/> 3. High accuracy</p> <p><input checked="" type="checkbox"/> 4. Low power consumption</p>
Q.72	Stray load losses in synchronous motors are caused by _____.
Ans	<p><input checked="" type="checkbox"/> 1. poor lubrication in bearings</p> <p><input checked="" type="checkbox"/> 2. excessive field excitation</p> <p><input checked="" type="checkbox"/> 3. leakage fluxes and harmonic effects</p> <p><input checked="" type="checkbox"/> 4. high rotor inertia</p>
Q.73	In Lambert's Cosine Law, the angle $\theta$ is measured between:
Ans	<p><input checked="" type="checkbox"/> 1. reflected light and normal</p> <p><input checked="" type="checkbox"/> 2. source and observer</p> <p><input checked="" type="checkbox"/> 3. incident light and normal</p> <p><input checked="" type="checkbox"/> 4. horizontal and vertical plane</p>

**Q.74** A single-phase distributor, 2 km long, has a line impedance of  $(0.2 + 0.3j) \Omega/\text{km}$ . It supplies a load at the far end, where the voltage  $V_B$  is 100 V and the current is 100 A at unity power factor. Additionally, a load of 100 A at 0.8 power factor lagging is connected at its midpoint. Calculate the voltage drop at the midpoint.



**Ans**

- 1.  $120 + j15$
- 2.  $110 + j15$
- 3.  $210 + j15$
- 4.  $120 + j30$

**Q.75** What is the purpose of a closed feeder ring in an interconnected system?

**Ans**

- 1. To reduce voltage stability
- 2. To prevent power distribution
- 3. To disconnect substations from each other
- 4. To create a looped power supply network

**Q.76** The collector to bias circuit in BJT has better stability than fixed bias circuit as \_\_\_\_\_.

**Ans**

- 1. it can operate on higher supply voltages than that of fixed bias circuit
- 2. it can operate on higher power than fixed bias circuit
- 3. its stability factor is lower than that of fixed bias
- 4. its stability factor is higher than that of fixed bias

**Q.77** Which underground cable laying method requires re-excavation for load expansion, making modifications costly?

**Ans**

- 1. Draw-in System
- 2. Overhead System
- 3. Trough Laying
- 4. Direct Laying

**Q.78** Power of an electrical system is measured in \_\_\_\_\_.

**Ans**

- 1. watt-sec
- 2. newton-metre
- 3. joule
- 4. watt

**Q.79** If the frequency of a series R-C circuit is increased, what happens to the capacitive reactance  $XC$ ?

**Ans**

- 1. It decreases
- 2. It remains constant
- 3. It increases
- 4. It becomes infinite

Q.80	Which of the following statements is NOT correct regarding the vector method in AC circuit analysis?
Ans	<p><input checked="" type="checkbox"/> 1. The vector method is used to represent sinusoidal AC quantities.</p> <p><input checked="" type="checkbox"/> 2. The vector method helps in determining the phase difference between voltage and current.</p> <p><input checked="" type="checkbox"/> 3. Phasors in the vector method rotate in a clockwise direction in the complex plane.</p> <p><input checked="" type="checkbox"/> 4. Phasor diagrams are used to solve AC circuit problems involving impedance.</p>
Q.81	A nuclear reactor produces $3.2 \times 10^{10}$ J of energy per second. How many fissions occur per second if each fission releases 200 MeV?
Ans	<p><input checked="" type="checkbox"/> 1. <math>10^{10}</math></p> <p><input checked="" type="checkbox"/> 2. <math>10^{21}</math></p> <p><input checked="" type="checkbox"/> 3. <math>10^{11}</math></p> <p><input checked="" type="checkbox"/> 4. <math>10^{19}</math></p>
Q.82	In relay terminology, what does the term 'pickup value' refer to?
Ans	<p><input checked="" type="checkbox"/> 1. The time delay before the relay operates after detecting a fault</p> <p><input checked="" type="checkbox"/> 2. The minimum value of the operating quantity (current, voltage, etc.) required to activate the relay</p> <p><input checked="" type="checkbox"/> 3. The voltage level at which the relay resets after a fault is cleared</p> <p><input checked="" type="checkbox"/> 4. The maximum current a relay can withstand without damage</p>
Q.83	The luminous intensity of a light source is defined as the luminous flux per unit:
Ans	<p><input checked="" type="checkbox"/> 1. volume</p> <p><input checked="" type="checkbox"/> 2. length</p> <p><input checked="" type="checkbox"/> 3. area</p> <p><input checked="" type="checkbox"/> 4. solid angle</p>
Q.84	Which control method enables four-quadrant operation of induction motors?
Ans	<p><input checked="" type="checkbox"/> 1. Variable Frequency Drive (VFD)</p> <p><input checked="" type="checkbox"/> 2. Rotor resistance control</p> <p><input checked="" type="checkbox"/> 3. Stator voltage control</p> <p><input checked="" type="checkbox"/> 4. Direct On-Line (DOL) starting</p>
Q.85	The EMF equation of a transformer is given by:
Ans	<p><input checked="" type="checkbox"/> 1. <math>E = 4.44fN\phi</math></p> <p><input checked="" type="checkbox"/> 2. <math>E = 4.44fNA\phi</math></p> <p><input checked="" type="checkbox"/> 3. <math>E = 4.44NA\phi</math></p> <p><input checked="" type="checkbox"/> 4. <math>E = 4.44f^2\phi N</math></p>
Q.86	Which of the following is an example of a constant load application for a DC shunt generator?
Ans	<p><input checked="" type="checkbox"/> 1. Centrifugal pump</p> <p><input checked="" type="checkbox"/> 2. DC arc welding</p> <p><input checked="" type="checkbox"/> 3. Induction heating</p> <p><input checked="" type="checkbox"/> 4. Electric motor</p>

**Q.87** In large-scale solar PV plants, why is string inverter technology preferred over central inverters in some cases?

**Ans**

- 1. It requires fewer connections and is easier to maintain.
- 2. It generates higher voltage DC output.
- 3. It reduces power losses due to shading and mismatch.
- 4. It eliminates the need for AC cabling.

**Q.88** How many types of heating elements are commonly used in electric irons?

**Ans**

- 1. Four
- 2. Two
- 3. One
- 4. Three

**Q.89** What is the bias stability factor (S) for a fixed bias circuit?

**Ans**

- 1.  $S = (1 + \beta) / (1 + \beta + \beta^2)$
- 2.  $S = (1 + \beta)$
- 3.  $S = \beta / (1 + \beta)$
- 4.  $S = 1 / (1 + \beta)$

**Q.90** During the no-load test of a transformer, the secondary winding is:

**Ans**

- 1. connected to a load
- 2. connected in parallel with the primary winding
- 3. short-circuited
- 4. open-circuited

**Q.91** The capacitance of a parallel plate capacitor depends upon:

**Ans**

- 1. potential difference between plates
- 2. thickness of plates
- 3. separation between plates
- 4. type of metal used

**Q.92** In Norton's Theorem, the equivalent circuit consists of \_\_\_\_.

**Ans**

- 1. a voltage source in parallel with a resistor
- 2. a current source in series with a resistor
- 3. a current source in parallel with a resistor
- 4. a voltage source in series with a resistor

**Q.93** Which of the following is a critical factor in the installation and estimation of agricultural pumps and flourmills?

**Ans**

- 1. Ignoring the load characteristics to simplify the design
- 2. Focusing only on the mechanical components of the system
- 3. Ensuring the system operates without any protective devices
- 4. Calculating the power requirements and selecting appropriate protective devices

**Q.94** If the impedance of a parallel circuit is given by  $Z = 5 - j4$ , then the admittance is given by \_\_\_\_\_.

**Ans**  1.  $5 + j4$

2.  $2.5 - j4$

3. 9

4.  $\frac{5 + j4}{41}$

**Q.95** Why is voltage drop analysis important in an AC distribution system?

**Ans**  1. To increase power losses

2. To reduce the system frequency

3. To increase resistance in the conductors

4. To ensure voltage levels remain within acceptable limits

**Q.96** In a transformer, if the frequency of the supply voltage is increased, what happens to the induced voltage?

**Ans**  1. It becomes zero

2. It remains the same

3. It decreases

4. It increases

**Q.97** In a transformer, the efficiency can be calculated with reasonable accuracy by knowing:

**Ans**  1. the losses (core and copper losses)

2. the input and output voltage

3. the short-circuit current

4. the rated power

**Q.98** If the power factor of a three-phase system is 0.8, and the apparent power is 10 kVA, then what is the active power?

**Ans**  1. 8 kW

2. 10 kW

3. 12 kW

4. 6 kW

**Q.99** How can polarity in transformers be verified?

**Ans**  1. By conducting a short circuit test

2. By measuring the input current

3. By checking the voltage across the secondary winding

4. By using a voltmeter to measure the voltage difference

**Q.100** What will be the voltage relationship of frequency domain relation for inductor having time domain  $v(t) = Ldi/dt$ ?

**Ans**  1.  $V(s) = LsI(s) - Li(0)$

2.  $V(s) = Li(s)$

3.  $V(s) = LsI(s)$

4.  $V(s) = Li(s) - Li(0)$