रेलवे भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS

सीईएन - 05/25 - जेई, डीएमएस, सीएमए - CEN - 05/25 - JE, DMS, CMA

सत्यमेव जयते

Test Date	02/07/2026
Test Time	9:00 AM - 11:00 AM
Subject / Exam Group	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 **You want to automatically advance slides with narration and animations during a presentation. Which MS PowerPoint feature should you use to achieve this?**

Ans
✗ 1. Slide Sorter
✓ 2. Rehearse Timings
✗ 3. Presenter View
✗ 4. Action Buttons

Q.2 **Which of the following best describes the velocity-time graph for an object moving with uniform velocity?**

Ans
✗ 1. A line starting from the origin and sloping upwards
✗ 2. A straight line sloping upwards from the time axis
✓ 3. A straight horizontal line parallel to the time axis
✗ 4. A curved line above the time axis

Q.3 **The primary method of managing biodegradable domestic waste after collection is _____.**

Ans
✗ 1. burnt in open air
✓ 2. conversion into compost
✗ 3. sending for recycling
✗ 4. throwing into sewers

Q.4 **What file extension is used to save an MS PowerPoint 2021 presentation?**

Ans
✗ 1. .xlsx
✗ 2. .pdf
✗ 3. .docx
✓ 4. .pptx

Q.5 **The Kol Rebellion (1831–32) mainly affected which plateau region?**

Ans
✗ 1. Deccan Plateau
✓ 2. Chotanagpur Plateau
✗ 3. Meghalaya Plateau
✗ 4. Malwa Plateau

Q.6 Which of the following statements best describes how the power of accommodation enables the human eye to focus on both near and distant objects?

Ans

✗ 1. The cornea provides all the focusing power required for clear vision

✗ 2. The iris controls the amount of light entering and helps to focus

✗ 3. The retina moves forward and backward to adjust the focus

✓ 4. The eye lens changes its focal length by altering its shape through ciliary muscle action

Q.7 What is the main reason sulfur dioxide irritates the upper respiratory mucous membrane?

Ans

✓ 1. It dissolves in moisture in upper respiratory tract and forms irritant

✗ 2. It oxidizes to sulphur trioxide and inhaled deep into lung

✗ 3. It combines with other pollutants and polymerizes in the lungs

✗ 4. It combines with haemoglobin and effect the oxygen transport

Q.8 Which of the following is a primary mission under India's National Action Plan on Climate Change (NAPCC)?

Ans

✓ 1. National Solar Mission

✗ 2. National Nutrition Mission

✗ 3. National Rural Livelihood Mission

✗ 4. National Highway Development Project

Q.9 A construction worker needs to lift a heavy metal beam using a lever but has a limited length of plank. Which adjustment would allow the worker to lift the beam with the least effort if the position of the fulcrum can be changed but the plank length remains constant?

Ans

✗ 1. Place the fulcrum at the center of the plank

✗ 2. Move the fulcrum closer to the worker

✗ 3. Keep the fulcrum fixed at any point

✓ 4. Move the fulcrum closer to the beam

Q.10 When was the 11th National Handloom Day celebrated across India under the coordination of the Ministry of Textiles?

Ans

✓ 1. August 7, 2025

✗ 2. September 7, 2025

✗ 3. November 7, 2025

✗ 4. October 7, 2025

Q.11 Which of the following rivers forms a delta along the eastern coastal plains?

Ans

✗ 1. Narmada

✓ 2. Godavari

✗ 3. Ganga

✗ 4. Tapi

Q.12 The Mappila Uprisings of the 19th century occurred mainly in which region of India?

Ans

✗ 1. Konkan region of Maharashtra

✗ 2. Sunderbans region of West Bengal

✗ 3. Coromandel Coast of Tamil Nadu

✓ 4. Malabar region of Kerala

Q.13 Which new warship was commissioned by the Indian Navy in November, 2025, to strengthen anti-submarine and coastal defence capabilities?

Ans
- ✔ 1. INS Mahe
- ✘ 2. INS Ikshak
- ✘ 3. INS Arnala
- ✘ 4. INS Vikrant

Q.14 Which of the following Articles states about the right of individual to form associations or unions or co-operative societies?

Ans
- ✘ 1. Article 19 (1) (d)
- ✔ 2. Article 19 (1) (c)
- ✘ 3. Article 19 (1) (b)
- ✘ 4. Article 19 (1) (a)

Q.15 Which of the following options must be DISABLED before manually setting the date and time in Windows?

Ans
- ✔ 1. Set time automatically
- ✘ 2. Night Light
- ✘ 3. Set time zone globally
- ✘ 4. Enable multiple clocks

Q.16 Which of the following is/are the primary reasons to fall in the trap of Email fraud or phishing?
A) Paying attention to lucrative offers.
B) Not checking on links or attachments from unknown senders
C) Providing official information via email
D) Paying attention to the company logo sent in the email

Ans
- ✔ 1. A, B, C Only
- ✘ 2. A only
- ✘ 3. A, B Only
- ✘ 4. A, B, D Only

Q.17 On which date is National Handloom Day observed in India?

Ans
- ✔ 1. 7 August
- ✘ 2. 18 August
- ✘ 3. 5 September
- ✘ 4. 2 October

Q.18 Which function returns the smallest value?

Ans
- ✘ 1. COUNT()
- ✘ 2. AVERAGE
- ✘ 3. MAX()
- ✔ 4. MIN()

Q.19 A farmer applies large amounts of chemical fertilizers over several years. Which consequence most likely results from this practice leading to soil pollution?

Ans
- ✔ 1. Accumulation of toxic substances in soil
- ✘ 2. Erosion of surface soil layers
- ✘ 3. Faster plant growth every season
- ✘ 4. Increase in earthworm population

Q.20 **Which pair of sectors is commonly addressed together in State Action Plan on Climate Change (SAPCC) adaptation planning?**

Ans

✔ 1. Water resources and health systems

✘ 2. Textile design and fashion marketing

✘ 3. Heavy industry and entertainment

✘ 4. Information technology and space research

Q.21 **A student pushes a heavy box that is already moving across a rough floor. If the force applied by the student is exactly equal to the frictional force opposing the motion, what will happen to the box?**

Ans

✔ 1. The box will move at a constant speed

✘ 2. The box will gradually come to rest

✘ 3. The box will move at increasing speed

✘ 4. The box will accelerate forward

Q.22 **Which of the following indicators is NOT typically used to measure sustainable development?**

Ans

✘ 1. Biocapacity

✘ 2. Ecological Footprint

✘ 3. Human Development Index (HDI)

✔ 4. Gross Domestic Product (GDP) growth rate

Q.23 **Which British colonial building in Mumbai, completed in 1888, showcases a blend of Victorian Gothic and Indian architectural elements?**

Ans

✔ 1. Chhatrapati Shivaji Maharaj Terminus

✘ 2. Gateway of India

✘ 3. Bombay Town Hall

✘ 4. Rajabai Clock Tower

Q.24 **Which experimental discovery contradicted Thomson's model of the atom and led to its rejection?**

Ans

✔ 1. Alpha particle scattering showing deflection at large angles

✘ 2. Measurement of atomic radius using X-ray diffraction

✘ 3. Discovery of the neutron by James Chadwick

✘ 4. Observation of line spectra of hydrogen by Bohr

Q.25 **Match the following columns.**

Pardoning power	Function
1. Commutation	a. Removes both sentence and the conviction.
2. Reprieve	b. Lesser sentence than originally given, in special case
3. Respite	c. Reducing the period of sentence without changing th of the sentence.
4. Remission	d. Temporary stay on the execution of a sentence.
5. Pardon	e. Substitution of one form of punishment to a lighter or

Ans

✘ 1. 1-c, 2-e, 3-b, 4-a, 5-d

✔ 2. 1-e, 2-d, 3-b, 4-c, 5-a

✘ 3. 1-a, 2-c, 3-d, 4-e, 5-b

✘ 4. 1-d, 2-b, 3-e, 4-c, 5-a

Q.26 The pollutant group commonly associated with oil spills in oceans is _____.

Ans
- ✗ 1. chemical fertilizers
- ✗ 2. agricultural pesticides
- ✗ 3. synthetic detergents
- ✓ 4. petroleum products

Q.27 A student accidentally spills some hydrochloric acid on a table. Which substance should be used to neutralise the acid safely?

Ans
- ✗ 1. Sugar solution
- ✗ 2. Vinegar
- ✓ 3. Baking soda solution
- ✗ 4. Lemon juice

Q.28 Which Quick Style type is applied only to selected words or individual characters within a paragraph in MS Word 2010?

Ans
- ✗ 1. Page styles
- ✗ 2. Linked styles
- ✓ 3. Character styles
- ✗ 4. Paragraph styles

Q.29 According to the Article 75 of the Indian Constitution, the total number of ministers (including the Prime Minister) in the Council of Ministers shall NOT exceed what percentage of the total members of the House of the People, i.e., Lok Sabha?

Ans
- ✗ 1. 25%
- ✗ 2. 10%
- ✓ 3. 15%
- ✗ 4. 20%

Q.30 In a real-life scenario, a chemist discovers a compound with the formula $CH_3CH_2CH(CH_3)CH_2CH_2OH$. What is the correct IUPAC name for this compound?

Ans
- ✗ 1. 3-methylhexanol
- ✗ 2. 4-methylpentanol
- ✗ 3. 2-methylhexanol
- ✓ 4. 3-methylpentan-1-ol

Q.31 How can we locate a file with a known extension but an unknown name in a large directory?

Ans
- ✓ 1. Using the Search box in File Explorer with *.ext
- ✗ 2. Checking the Recycle Bin
- ✗ 3. Using the dir command
- ✗ 4. Through File Explorer

Q.32 The term 'smog' is a combination of _____.

Ans
- ✗ 1. Fog and clouds
- ✓ 2. Smoke and fog
- ✗ 3. Smoke and haze
- ✗ 4. Smog and mist

Q.33 According to Thomson's model, how are electrons arranged in an atom?

Ans
- ✗ 1. Moving in fixed orbits around the nucleus
- ✗ 2. Randomly placed inside the nucleus
- ✓ 3. Embedded in a positively charged sphere like seeds in a watermelon
- ✗ 4. Orbiting around neutrons in elliptical paths

Q.34 If cell A1 = 10 and B1 = 20, what will `=A1+B1` return?

Ans
- ✗ 1. 1020
- ✗ 2. 200
- ✓ 3. 30
- ✗ 4. Error

Q.35 The Atal Bhujal Yojana 2020 focused on improving water resources management of how many states?

Ans
- ✗ 1. eight
- ✗ 2. five
- ✓ 3. seven
- ✗ 4. ten

Q.36 Which of the following best describes how sound travels through air?

Ans
- ✓ 1. The air particles vibrate back and forth parallel to the direction of the wave
- ✗ 2. The air particles remain stationary while the wave moves through
- ✗ 3. The air particles vibrate up and down perpendicular to the direction of the wave
- ✗ 4. The air particles move in circular paths as the wave passes

Q.37 What is the general formula of alkenes?

Ans
- ✗ 1. C_nH_n
- ✓ 2. C_nH_{2n}
- ✗ 3. C_nH_{2n+2}
- ✗ 4. C_nH_{2n-2}

Q.38 Which type of computer virus attaches itself to executable files and gets activated when the file is run?

Ans
- ✗ 1. Worm
- ✗ 2. Boot Sector Virus
- ✗ 3. Macro Virus
- ✓ 4. File Infector Virus

Q.39 If 10 grams of salt are dissolved in 100 mL of water, which component is the solute?

Ans
- ✗ 1. Water only
- ✗ 2. Neither
- ✗ 3. Both salt and water
- ✓ 4. Salt only

Q.40 Biomedical waste handlers in a hospital are at risk of occupational hazards. The most effective way to protect them from exposure to infectious materials is:

Ans
- ✓ 1. Use of protective equipment and safe handling
- ✗ 2. Regular medical check-ups
- ✗ 3. Segregation of waste into color-coded bins
- ✗ 4. Vaccination against common infections

Q.41 Which of the following statements is true about the Outbox?

Ans
- ✗ 1. It contains emails that are currently being drafted.
- ✓ 2. It temporarily stores emails that are queued for sending.
- ✗ 3. It holds emails that have been successfully sent.
- ✗ 4. It is used to receive incoming emails.

Q.42 Who won the maximum number of medals at the 38th National Games of India?

Ans
- ✗ 1. Manu Bhaker
- ✗ 2. Neeraj Chopra
- ✓ 3. Dhinidhi Desinghu
- ✗ 4. Bajrang Punia

Q.43 Which of the following satellites was launched on November 2, 2025, to enhance the Indian Navy's secure communication network and maritime surveillance capabilities?

Ans
- ✗ 1. RISAT-2B
- ✗ 2. GSAT-6A
- ✓ 3. CMS-03 (GSAT-7R)
- ✗ 4. Cartosat-3

Q.44 Consider the following statements regarding chemical reactions and choose the correct option.

Statement I: Every reaction in which two or more reactants combine to form a single product is classified as a combination reaction regardless of heat change.
Statement II: The reaction $CaO(s) + H_2O(l) \rightarrow Ca(OH)_2(aq)$ + heat is both a combination reaction and an exothermic reaction.

Ans
- ✗ 1. Both statements are incorrect
- ✓ 2. Both statements are correct
- ✗ 3. Only Statement I is correct
- ✗ 4. Only Statement II is correct

Q.45 A field exposed to excessive pesticide use shows a sharp decline in earthworm population. The resulting effect on soil is:

Ans
- ✓ 1. Reduced soil fertility
- ✗ 2. Increased water retention
- ✗ 3. Enhanced decomposition
- ✗ 4. Improved aeration

Q.46 Which of the following statements best describes the behavior of magnetic field lines around a straight current-carrying conductor?

Ans
- ✓ 1. They form concentric circles centered on the conductor.
- ✗ 2. They change direction randomly along the wire.
- ✗ 3. They are parallel straight lines along the wire.
- ✗ 4. They radiate straight outward from the wire.

Q.47 Which condition is required for a displacement reaction between a metal and salt solution?

Ans
- ✓ 1. Metal must be higher in reactivity series
- ✗ 2. Metal must be same as salt constituent
- ✗ 3. Reaction must be endothermic
- ✗ 4. Salt must be insoluble in water

Q.48 The atmospheric component that remains largely unreactive is _____.

Ans
- ✓ 1. Argon
- ✗ 2. Carbon dioxide
- ✗ 3. Methane
- ✗ 4. Oxygen

Q.49 The primary goal of the Pradhan Mantri Gram Sadak Yojana (PMGSY) is to:

Ans

✗ 1. Enhance telecommunication services in cities

✗ 2. Promote renewable energy usage

✓ 3. Provide rural connectivity through road construction

✗ 4. Develop urban infrastructure

Q.50 A factory plans to install a powerful electromagnet for lifting metal scraps. To maximize the magnetic field strength around the coil, which of the following combinations would be most effective?

Ans

✗ 1. Using a copper core, increasing coil turns, and lowering current

✗ 2. Using a steel core, decreasing coil turns, and lowering current

✗ 3. Using an air core, decreasing coil turns, and keeping current constant

✓ 4. Using a soft iron core, increasing coil turns, and increasing current through the coil

Section : **Technical Abilities**

Q.1 An induction furnace operates at 10 kHz and is used to melt 100 kg of steel. If the efficiency is 60% and the energy required to melt steel is 1500 kWh/ton, what is the minimum energy input needed?

Ans

✓ 1. 250 kWh

✗ 2. 150 kWh

✗ 3. 180 kWh

✗ 4. 90 kWh

Q.2 The curve obtained in the input characteristics of a BJT in common-emitter (CE) configuration is _____.

Ans

✗ 1. Similar to a reverse breakdown curve

✗ 2. Linear for all voltages

✓ 3. Similar to a forward diode curve

✗ 4. A horizontal straight line

Q.3 A protective device with high rupturing capacity can:

Ans

✗ 1. Reduce transmission line inductance during balanced load operation only

✗ 2. Improve voltage regulation of transformers during overload conditions

✗ 3. Increase insulation resistance during normal system operating conditions

✓ 4. Safely interrupt heavy fault currents without equipment damage occurrence

Q.4 A 12μF capacitor and a 4μF capacitor are connected in series. The ratio of voltages across them will be:

Ans

✗ 1. 4:1

✗ 2. 1:4

✗ 3. 3:1

✓ 4. 1:3

Q.5 What is the purpose of a Buchholz relay in transformer protection?

Ans

✓ 1. To detect internal faults such as short circuits and arcing in oil

✗ 2. To detect overvoltage

✗ 3. To measure core flux

✗ 4. To measure temperature rise

Q.6 In a series R–C circuit supplied with sinusoidal AC voltage, the current leads the applied voltage by an angle Ø. Which of the following correctly expresses this phase angle?

Ans
✗ 1. $\tan \varnothing = \frac{R}{X_C}$
✗ 2. $\tan \varnothing = -\frac{R}{X_C}$
✓ 3. $\tan \varnothing = -\frac{X_C}{R}$
✗ 4. $\tan \varnothing = X_C R$

Q.7 **Which of the following statements about damping in moving-iron instruments is correct?**

Ans
✓ 1. Damping in MI instruments is usually provided by air friction
✗ 2. Damping in MI instruments is usually provided by eddy currents in an aluminium disc
✗ 3. Damping in MI instruments is usually not required because the pointer is very light
✗ 4. Damping in MI instruments is usually provided by a permanent magnet

Q.8 **Which method is commonly used to reduce earth resistance in an electrical installation?**

Ans
✗ 1. Increasing the supply voltage
✗ 2. Reducing the size of the earth conductor
✓ 3. Increasing the number of earth electrodes
✗ 4. Using a higher-rated fuse

Q.9 **What happens to the magnetic field around a straight current-carrying conductor when the current through it is increased?**

Ans
✗ 1. Magnetic field disappears
✓ 2. Magnetic field strength increases
✗ 3. Magnetic field strength remains the same
✗ 4. Magnetic field strength decreases

Q.10 **How is the phase angle between voltage V and total current I_S in a parallel RLC circuit determined?**

Ans
✗ 1. By comparing voltage drops across each element
✗ 2. From the angle between V and I_R
✗ 3. By subtracting I_L from I_C
✓ 4. From the angle between V and the vector sum of I_R, I_L, and I_C

Q.11 **Consider the following statements about torque in synchronous motors.**

I. The torque in a synchronous motor is produced only when the rotor is locked into synchronism.
II. The torque is directly proportional to the sine of the load angle (δ).
III. Synchronous motor develops starting torque proportional to the power input.
IV. Maximum torque occurs at δ = 180°.

Which of the above statements are correct?

Ans
✗ 1. Statements II, III & IV only
✗ 2. Statements II & IV only
✗ 3. Statements I, II & III only
✓ 4. Statements I & II only

Q.12 **Which Law illustrates the relationship between induced electromotive force (EMF) and the time variation of magnetic flux in a coil?**

Ans
- ✗ 1. Ampere Circuital Law
- ✓ 2. Faraday Law of Induction
- ✗ 3. Lenz's Law
- ✗ 4. Columb's Law

Q.13 **Which of the following statements about the atomic hydrogen arc welding process is correct?**

Ans
- ✗ 1. It works with a consumable iron electrode in a hydrogen atmosphere.
- ✓ 2. It employs two non-consumable tungsten electrodes to create an arc in a hydrogen atmosphere.
- ✗ 3. It requires two non-consumable tungsten electrodes and an oxygen-rich atmosphere.
- ✗ 4. It utilizes a single carbon electrode to generate heat in hydrogen atmosphere.

Q.14 **For accurate measurement of inductors using Hay's bridge, which characteristic should the inductor primarily possess?**

Ans
- ✓ 1. High Q-factor
- ✗ 2. Medium Q-factor
- ✗ 3. High resistance
- ✗ 4. Low Q-factor

Q.15 **In a three-phase induction motor, the phasor diagram shows an angle between the applied stator voltage and the resulting stator current. This angle primarily indicates:**

Ans
- ✗ 1. Rotor frequency
- ✗ 2. Synchronous speed
- ✓ 3. Input power factor
- ✗ 4. Rotor slip

Q.16 **A low demand factor in an electrical installation indicates that:**

Ans
- ✗ 1. Average electrical load remains equal to maximum system demand continuously
- ✓ 2. Connected electrical load is much greater than maximum power demand
- ✗ 3. Maximum electrical demand exceeds total connected electrical load capacity
- ✗ 4. Individual consumer demands occur simultaneously during system operation

Q.17 **In seam welding, the electrodes are made of _____.**

Ans
- ✗ 1. aluminium
- ✗ 2. brass
- ✗ 3. tungsten
- ✓ 4. copper alloys

Q.18 **An oscilloscope displays a measured rise time of 10 ns when observing a fast pulse. If the oscilloscope itself has a specified rise time of 6 ns, then what is the approximate actual rise time of the signal being measured?**

Ans
- ✗ 1. 4 ns
- ✓ 2. 8 ns
- ✗ 3. 6 ns
- ✗ 4. 12 ns

Q.19 **Which strategy reduces electricity charges under a power factor tariff system for a manufacturing plant with predominantly inductive loads?**

Ans

✗ 1. Switching to higher voltage transformers without changing load characteristics

✓ 2. Installing capacitors to improve the power factor of inductive loads

✗ 3. Operating all equipment at full load constantly

✗ 4. Increasing lighting hours during low demand periods

Q.20 **Why does a squirrel cage induction motor not develop maximum starting torque?**

Ans

✗ 1. Slip is less than unity at starting

✓ 2. Rotor resistance is fixed and low

✗ 3. Rotor reactance is zero at starting

✗ 4. Rotor resistance can be externally varied at starting

Q.21 **Which modification in an earthing system most directly reduces earth resistance by improving the contact area between the electrode and surrounding soil?**

Ans

✗ 1. Connecting the earth conductor to the neutral wire only

✓ 2. Increasing the effective contact area by using multiple or larger earth electrodes

✗ 3. Using a higher supply voltage in the installation

✗ 4. Increasing the rating of the protective fuse

Q.22 **Which consideration is important while deciding the capacity of a power station?**

Ans

✗ 1. Type of paint applied on generating station external building surfaces

✗ 2. Number of ceiling fans installed inside administrative office sections

✓ 3. Expected maximum electrical demand and future load growth requirements

✗ 4. Shape of fencing structure surrounding the generating station premises

Q.23 **What is the primary fuel used in a biomass power plant?**

Ans

✗ 1. Natural gas

✗ 2. Uranium

✓ 3. Organic waste materials

✗ 4. Coal

Q.24 **A machine delivers power that is three times its original value, while the duration of operation stays unchanged. How does the work done by the machine change?**

Ans

✓ 1. It becomes three times larger.

✗ 2. It becomes one-third of the original.

✗ 3. It remains unchanged.

✗ 4. It becomes nine times larger.

Q.25 **Which statement about magnetic flux is false?**

Ans

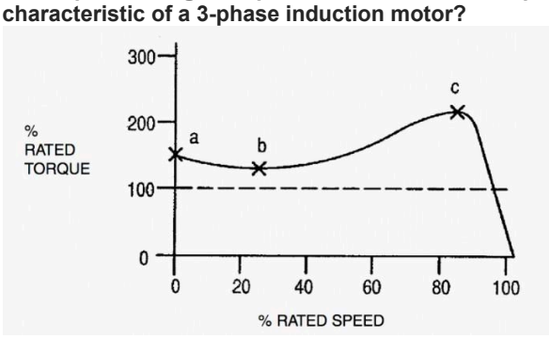
✗ 1. Magnetic flux density unit is Tesla or weber per meter square (Wb/m^2).

✓ 2. Magnetic flux does not have any SI unit.

✗ 3. Magnetic flux is analogous to current in electric circuit.

✗ 4. Magnetic flux density is the magnetic flux passing through per unit cross-section area.

Q.26 **Which point or region represents the Pull-out Torque in the shown torque-speed characteristic of a 3-phase induction motor?**



Ans
- ✗ 1. Point b
- ✗ 2. Point a
- ✗ 3. Anywhere between point a and b
- ✓ 4. Point c

Q.27 **Which set of statements correctly describes the steady state speed-torque characteristics of a three-phase synchronous motor?**
i) Runs at constant synchronous speed
ii) Starting torque is zero
iii) Torque increases significantly with slip
iv) Not suitable for variable speed drives
v) Maintains speed under varying loads

Ans
- ✗ 1. (i), (iii), (iv) and (v) only
- ✗ 2. (i), (ii), (iii) and (v) only
- ✓ 3. (i), (ii), and (v) only
- ✗ 4. (i), (ii), (iii) and (iv) only

Q.28 **Identify the correct equation for controlling torque (T_c) in a spring-controlled moving iron instrument, where K is the spring constant and θ is the deflection angle.**

Ans
- ✗ 1. $T_c = \frac{K}{\theta}$
- ✗ 2. $T_c = K + \theta$
- ✗ 3. $T_c = K - \theta$
- ✓ 4. $T_c = K\theta$

Q.29 **In a closed electrical loop supplied by 10 V, two resistors produce voltage drops of 6 V and 4 V, respectively. Which statement correctly expresses Kirchhoff's Voltage Law for this loop?**

Ans
- ✗ 1. The current through the two resistors is different
- ✓ 2. The algebraic sum of all voltages around the loop is zero
- ✗ 3. The source voltage is greater than the total voltage drop
- ✗ 4. The source voltage is less than the total voltage drop

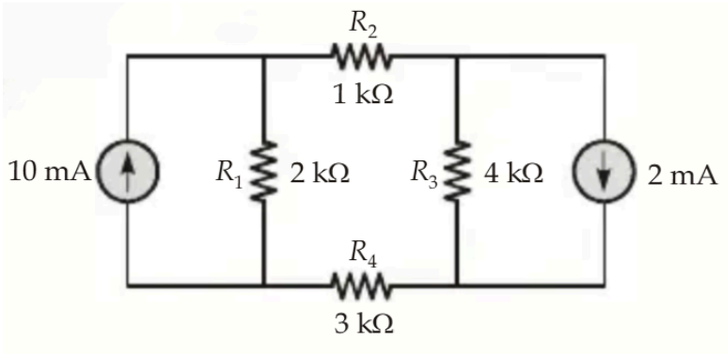
Q.30 **A three-phase slip ring induction motor is preferred over a squirrel cage induction motor for which of the following application scenarios?**

Ans
- ✗ 1. When highest efficiency is the only concern
- ✗ 2. When constant speed under all load conditions is needed
- ✓ 3. When variable speed and high starting torque are required
- ✗ 4. When reduced maintenance is the top priority

Q.31 **Which of the following devices provide rapid fault current interruption independently in a high-voltage power distribution system?**

Ans
- ✔ 1. HRC fuse
- ✘ 2. Isolator
- ✘ 3. Contactor
- ✘ 4. Linear coupler

Q.32 **For the circuit shown in the figure, the current through the resistor R_2 is _____.**



Ans
- ✘ 1. 1.8 mA
- ✔ 2. 2.8 mA
- ✘ 3. 4 mA
- ✘ 4. 2 mA

Q.33 **The hypotenuse of the power triangle represents which type of power?**

Ans
- ✘ 1. Reactive power
- ✘ 2. Power factor
- ✔ 3. Apparent power
- ✘ 4. Active power

Q.34 **What is the main purpose of providing a properly installed earthing system in electrical installations?**

Ans
- ✔ 1. To provide a safe path for leakage and fault currents to earth
- ✘ 2. To increase the insulation resistance of conductors
- ✘ 3. To reduce the reactance of the line conductors
- ✘ 4. To improve the power factor of the electrical system

Q.35 **A Squirrel cage induction generator operates at _____ speed for electric generation in wind turbines.**

Ans
- ✘ 1. variable
- ✘ 2. slip
- ✔ 3. constant
- ✘ 4. negligible

Q.36 **What is the main disadvantage of a half-wave rectifier?**

Ans
- ✔ 1. Utilizes only one half-cycle
- ✘ 2. Ripple frequency equal to supply frequency
- ✘ 3. Requires center-tap transformer
- ✘ 4. High cost

Q.37 Determine whether x(t)=sin(3t) + sin(5t) is periodic. If yes, find its fundamental period.

Ans

✗ 1. Non-periodic

✗ 2. T=π/5

✓ 3. T=2π

✗ 4. T=π

Q.38 A maximum demand tariff is designed to encourage consumers to _____.

Ans

✗ 1. Adopt renewable energy sources

✗ 2. Increase energy production

✗ 3. Reduce overall energy consumption

✓ 4. Manage and reduce their peak power demand

Q.39 Which combination of the following statements about direct resistance heating are correct?
i) The process requires the charge to be electrically conductive.
ii) Electrodes are placed in direct contact with the charge.
iii) Heat is generated by induced eddy currents in the charge.
iv) The charge does not form part of the electric circuit.

Ans

✗ 1. (ii) and (iii) only

✗ 2. (iii) and (iv) only

✗ 3. (i) and (iv) only

✓ 4. (i) and (ii) only

Q.40 What does the Reduction Factor in illumination refer to?

Ans

✗ 1. The ratio of total luminous flux to the consumed electrical power

✓ 2. The ratio of actual illuminance to theoretical illuminance

✗ 3. The percentage of light lost due to reflection and absorption

✗ 4. The ratio of the illumination at a given point to the initial illumination

Q.41 In a single-phase parallel RL circuit connected to a single phase AC supply, which of the following is correct?

Ans

✗ 1. Power factor is unity

✗ 2. Current leads voltage

✗ 3. Power factor is leading

✓ 4. Current lags voltage

Q.42 On a CRO screen, a DC voltage causes a vertical deflection of 4 divisions. If the vertical sensitivity is 2 V/div, what is the value of the DC voltage?

Ans

✗ 1. 4 V

✓ 2. 8 V

✗ 3. 2 V

✗ 4. 6 V

Q.43 Which of the following is used to join two cable conductors?

Ans

✗ 1. Cable marking

✓ 2. Splicing

✗ 3. Surface coating

✗ 4. Insulation taping

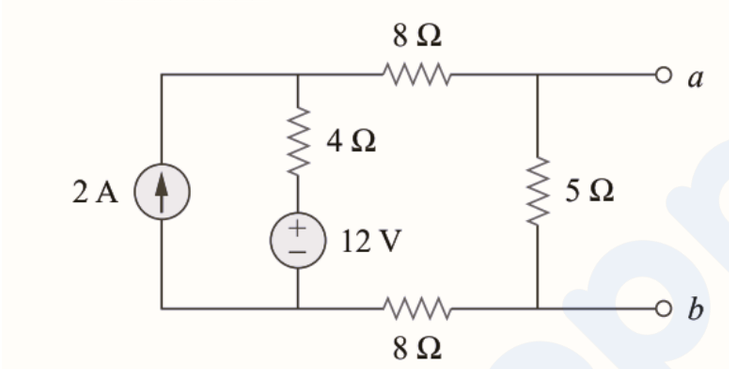
Q.44 **A current I flows through a circular loop. If the radius of the loop is reduced to half and the current is doubled, the magnetic field intensity at the center becomes:**

Ans
✗ 1. Unchanged
✓ 2. Four times the original value
✗ 3. Twice the original value
✗ 4. Eight times the original value

Q.45 **A PNP transistor is operating in active region. If the emitter voltage decreases such that the emitter becomes less positive than the base while the biasing condition of the collector-base junction remains unchanged, the transistor will enter _____.**

Ans
✗ 1. Active region with higher gain
✗ 2. Reverse active region
✓ 3. Cut-off region
✗ 4. Saturation region

Q.46 **The Norton equivalent of the circuit shown in figure at terminals a-b are _____.**



Ans
✗ 1. $R_N = 4\Omega$, $I_N = 2$ A
✗ 2. $R_N = 25\Omega$, $I_N = 1$ A
✓ 3. $R_N = 4\Omega$, $I_N = 1$ A
✗ 4. $R_N = 25\Omega$, $I_N = 3$ A

Q.47 **Which statement correctly explains the principle of direct resistance heating?**

Ans
✓ 1. Heat is generated by the resistance of the material through which the current flows, and it is applied directly to the heating element
✗ 2. Heat is produced through the conversion of mechanical energy into heat
✗ 3. The heating element works by electromagnetic induction
✗ 4. The process is based on the principle of convective heat transfer

Q.48 **Which of the following is a key maintenance practice for reliable operation of a 3-phase induction motor?**

Ans
✓ 1. Regular lubrication of bearings and periodic insulation resistance testing.
✗ 2. Short-circuiting the stator windings when the motor is idle.
✗ 3. Increasing slip by intentionally weakening rotor bars.
✗ 4. Running the motor continuously at no-load to avoid heating.

Q.49 **Which of the following balanced phase-voltage phasor sets represents an abc positive-sequence system?**

Ans
✗ 1. Va = 0°, Vb = 120°, Vc = -120°
✗ 2. Va = 0°, Vb = -90°, Vc = -180°
✓ 3. Va = 0°, Vb = -120°, Vc = 120°
✗ 4. Va = 0°, Vb = 90°, Vc = 180°

Q.50 **In a DC generator, the magnitude of induced EMF is directly proportional to:**

Ans
- ✗ 1. the inverse of number of conductors
- ✓ 2. the product of flux per pole and speed
- ✗ 3. the square of flux per pole
- ✗ 4. the armature resistance

Q.51 **A DC shunt motor is initially running at no load. What is the effect on its speed when the load is increased?**

Ans
- ✓ 1. The speed decreases slightly
- ✗ 2. The speed remains constant
- ✗ 3. The speed increases slightly
- ✗ 4. The speed decreases significantly

Q.52 **A power factor tariff is introduced in energy billing to encourage consumers to _____.**

Ans
- ✗ 1. Receive discounts based only on total energy consumption
- ✓ 2. Improve their power factor for more efficient use of electrical power
- ✗ 3. Reduce electricity consumption during peak hours
- ✗ 4. Pay a fixed electricity charge regardless of usage pattern

Q.53 **What is an advantage of a bridge rectifier over a center-tapped full-wave rectifier?**

Ans
- ✗ 1. A bridge rectifier requires fewer diodes for rectification
- ✗ 2. A bridge rectifier uses only half of the transformer secondary winding
- ✗ 3. A bridge rectifier produces a higher ripple factor at the output
- ✓ 4. A bridge rectifier can operate using diodes with lower peak inverse voltage rating

Q.54 **In the graphical analysis of a FET amplifier, what is the primary purpose of the load line?**

Ans
- ✓ 1. To determine the operating point of the FET
- ✗ 2. To determine the input impedance of the FET
- ✗ 3. To determine the power gain of the FET
- ✗ 4. To determine the output impedance of the FET

Q.55 **Three impedances, each of (3−4j) Ω, are connected in delta to a 200 V, three-phase, 50 Hz balanced supply. What are the values of line current and phase current, respectively, in the delta-connected load?**

Ans
- ✗ 1. $40\ \text{A and } 40\sqrt{3}\ \text{A}$
- ✓ 2. $40\sqrt{3}\ \text{A and } 40\ \text{A}$
- ✗ 3. $40\ \text{A and } 40\ \text{A}$
- ✗ 4. $40\sqrt{3}\ \text{A and } 40\sqrt{3}\ \text{A}$

Q.56 **What does the plant use factor represent?**

Ans
- ✓ 1. The ratio of actual energy generated to the product of plant capacity and hours of use
- ✗ 2. The ratio of actual energy generated to the total installed capacity
- ✗ 3. The ratio of average load to maximum demand
- ✗ 4. The ratio of maximum demand to the total installed capacity

Q.57 **What is a typical starting torque characteristic of a shaded pole induction motor?**

Ans
- ✓ 1. Low starting torque and low efficiency
- ✗ 2. High starting torque and high efficiency
- ✗ 3. High starting torque and low efficiency
- ✗ 4. Low starting torque and high efficiency

Q.58 In a three-phase induction energy meter, the disc rotates due to the interaction between the magnetic fields produced by:

Ans
- ✗ 1. the shunt coil and the field winding
- ✗ 2. the current and cooling coils
- ✗ 3. the mechanical gears and shaft
- ✓ 4. the pressure and current coils

Q.59 If the frequency of an AC source is doubled, the impedance of a pure resistor _____.

Ans
- ✓ 1. remains unchanged
- ✗ 2. quadruples
- ✗ 3. doubles
- ✗ 4. halves

Q.60 In a radial distribution system, which factor causes an increase in voltage drop?

Ans
- ✓ 1. Increase in load current
- ✗ 2. Increase in insulation
- ✗ 3. Decrease in distance
- ✗ 4. Decrease in resistance

Q.61 Why are instrument transformers used with a wattmeter for high-power AC measurements?

Ans
- ✓ 1. To extend the current and voltage range of the wattmeter safely
- ✗ 2. To eliminate the need for a pressure coil in the wattmeter
- ✗ 3. To reduce the frequency of the measured circuit
- ✗ 4. To convert AC power into DC power

Q.62 Which of the following sets of statements about the causes of errors in current transformers is correct?
i) Leakage reactance in secondary winding contributes to ratio error
ii) High magnetizing current increases phase angle error
iii) Burden with low power factor increases phase angle error
iv) Core saturation reduces both ratio and phase angle errors

Ans
- ✗ 1. (ii) and (iv) only
- ✗ 2. (i) and (iv) only
- ✓ 3. (i), (ii) and (iii) only
- ✗ 4. (iii) and (iv) only

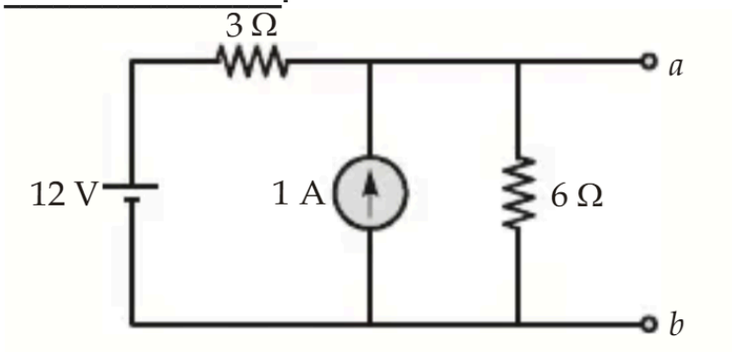
Q.63 In a single-phase RL circuit, the RMS voltage across the supply is 100 V, the RMS current is 5 A, and the current lags the voltage by 60°. Determine the apparent power of the circuit.

Ans
- ✓ 1. 500 VA
- ✗ 2. 250 VA
- ✗ 3. 400 VA
- ✗ 4. 200 VA

Q.64 A 12 V battery is connected in series with two resistors 4 Ω and 6 Ω, forming a closed circuit. What is the Thevenin equivalent resistance across the terminals of the 6 Ω resistor after it is removed?

Ans
- ✗ 1. 10 Ω
- ✗ 2. 2 Ω
- ✗ 3. 6 Ω
- ✓ 4. 4 Ω

Q.65 **The Thevenin equivalent voltage at terminals a-b is _____.**



Ans
✗ 1. 12 V
✓ 2. 10 V
✗ 3. 9 V
✗ 4. 6 V

Q.66 **Which of the following is the main purpose of earth resistance measurement?**

Ans
✓ 1. Ensure safe dissipation of fault current
✗ 2. Reduce frequency variation
✗ 3. Increase power output
✗ 4. Improve voltage level

Q.67 **Megger is an instrument used to measure _____.**

Ans
✗ 1. Current carrier.
✓ 2. High resistance.
✗ 3. Source of e.m.f.
✗ 4. Type of a null detector.

Q.68 **Where is the shading coil placed in a shaded-pole motor?**

Ans
✓ 1. On a portion of the stator pole
✗ 2. On the air-gap surface only
✗ 3. On the rotor shaft
✗ 4. On the motor bearings

Q.69 **Retentivity in a B-H curve indicates:**

Ans
✗ 1. Reverse magnetic field required to reduce flux density to zero
✗ 2. Maximum field strength
✗ 3. Resistance to demagnetization
✓ 4. Magnetic flux density left after removing the external magnetizing force

Q.70 **Anderson's bridge belongs to which category of measuring circuits?**

Ans
✓ 1. AC bridge for inductance measurement
✗ 2. DC potentiometer circuit
✗ 3. Resonance circuit for frequency measurement
✗ 4. DC bridge for resistance measurement

Q.71 **The speed of a synchronous motor depends on:**

Ans
✓ 1. Supply frequency
✗ 2. Field resistance
✗ 3. Load only
✗ 4. Armature current

Q.72 **Which of the following points are True regarding the effect of short-time duty on the size and cost of electric motors?**

i) Short-time duty allows use of higher rated motors for short durations.
ii) Motors used for short-time duty are generally smaller for the same load.
iii) Short-time duty increases the need for oversized enclosures.
iv) Cost per kW is lower for motors used in short-time duty.

Ans
- ✗ 1. (ii), (iii), and (iv) only
- ✗ 2. (i), (iii), and (iv) only
- ✗ 3. (i) and (iii) only
- ✓ 4. (i), (ii), and (iv) only

Q.73 **A room requires an average illuminance of 200 lux over a 60 square meter area. If the total luminous flux emitted by the lamps is 15000 lumens and the utilization factor is 0.8, what is the actual illuminance achieved?**

Ans
- ✗ 1. 125 lux
- ✗ 2. 100 lux
- ✗ 3. 160 lux
- ✓ 4. 200 lux

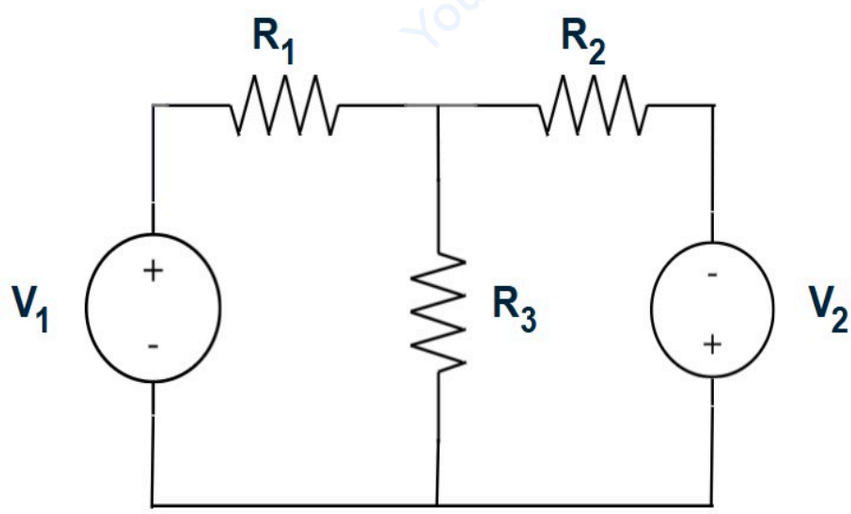
Q.74 **At which voltage level are the maximum consumers connected?**

Ans
- ✗ 1. primary distribution level
- ✗ 2. secondary transmission level
- ✗ 3. primary transmission level
- ✓ 4. secondary distribution level

Q.75 **A single-phase preventer continuously monitors and protects preferably which motor against phase failure?**

Ans
- ✗ 1. DC Motor
- ✓ 2. 3-phase induction motor
- ✗ 3. Reluctance motor
- ✗ 4. Single phase induction motor

Q.76 **In the given circuit R_1= 6Ω, R_2= 4Ω and R_3= 3Ω. The voltage sources are V_1 = 21V and V_2 = 5V. Determine the currents flowing through R_1 and R_2, respectively.**



Ans
- ✓ 1. 3A and 2A
- ✗ 2. 2A and 3A
- ✗ 3. 4A and 6A
- ✗ 4. 2A and 6A

Q.77 Three identical capacitors are connected in parallel. If the total charge stored in the system is Q, what is the charge on each individual capacitor?

Ans
- ✗ 1. Q/9
- ✗ 2. Q
- ✗ 3. 3Q
- ✓ 4. Q/3

Q.78 Select the option that is correct regarding the following two statements labelled Assertion (A) and Reason (R).

Assertion (A): Three-phase auto-transformers are smaller and lighter than equivalent three-phase two-winding transformers.
Reason (R): Auto-transformers use fewer windings and a smaller core.

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

Q.79 The output of an alternator is taken from the:

Ans
- ✗ 1. Rotor winding
- ✗ 2. Commutator
- ✗ 3. Field winding
- ✓ 4. Stator winding

Q.80 An underground cable used in power systems should possess which important requirement?

Ans
- ✗ 1. High magnetic saturation capability inside cable conductor arrangements only
- ✗ 2. Low melting point of conductor material during fault conditions
- ✗ 3. Variable conductor diameter during balanced load operating conditions
- ✓ 4. High insulation resistance and adequate mechanical strength properties

Q.81 Two inductors of 8 H and 2 H connected in series opposing with mutual inductance of 1 H will have equivalent:

Ans
- ✓ 1. 8 H
- ✗ 2. 9 H
- ✗ 3. 5 H
- ✗ 4. 11 H

Q.82 Concentrating solar technology is a type of solar power technology which:

Ans
- ✗ 1. uses sunlight energy to directly rotate turbines without a heat conversion stage
- ✓ 2. uses mirrors to focus sunlight, generating heat that drives turbines to produce electricity
- ✗ 3. directly converts sunlight into electricity using photovoltaic (PV) panels
- ✗ 4. produces heat from sunlight without using mirrors or optical concentration

Q.83 What is the main objective of backup protection in a power system?

Ans
- ✗ 1. To detect minor disturbances in voltage
- ✗ 2. To increase the complexity of the system
- ✓ 3. To isolate faults if primary protection fails
- ✗ 4. To operate faster than primary protection

Q.84 **A PNP transistor is fabricated with an increased base doping concentration while keeping all other physical dimensions and doping levels constant. What is the effect on the transistor's performance?**

Ans
- ✗ 1. The emitter injection efficiency increases
- ✗ 2. The collector current becomes independent of emitter current
- ✓ 3. The common-emitter current gain decreases
- ✗ 4. The base transport factor increases.

Q.85 **A limitation of Buchholz relay protection is:**

Ans
- ✗ 1. Automatic detection of gas accumulation inside transformer oil systems
- ✗ 2. Detection of incipient faults inside oil immersed transformers effectively
- ✗ 3. Fast isolation of internal transformer faults during abnormal conditions
- ✓ 4. Operation possible only in transformers provided with conservator tanks

Q.86 **The fundamental operating principle of a transformer is based on:**

Ans
- ✗ 1. direct electrical conduction between primary and secondary windings for energy transfer
- ✓ 2. electromagnetic induction between two electrically isolated coils magnetically coupled through a low-reluctance magnetic circuit
- ✗ 3. mechanical coupling of coils to facilitate energy transfer through physical motion
- ✗ 4. conversion of alternating current (AC) into direct current (DC) via semiconductor devices

Q.87 **The maximum fault current attained during a short circuit at the instant before the fuse completely interrupts the circuit is called:**

Ans
- ✗ 1. Rated current
- ✗ 2. Melting current
- ✗ 3. Breaking capacity
- ✓ 4. Cut-off current

Q.88 **When an alternator operates at unity power factor, the armature current:**

Ans
- ✗ 1. leads terminal voltage
- ✗ 2. lags terminal voltage
- ✗ 3. is opposite to terminal voltage
- ✓ 4. is in phase with terminal voltage

Q.89 **In a parallel RC circuit connected to a single-phase AC supply, the correct relationship between the supply voltage and the total circuit current is _____.**

Ans
- ✗ 1. Current is in phase with the voltage
- ✗ 2. Current lags the voltage
- ✗ 3. Current and voltage are 180° out of phase
- ✓ 4. Current leads the voltage

Q.90 **Field failure protection in an alternator is provided to detect:**

Ans
- ✗ 1. Variation in illumination intensity inside generator control panels
- ✓ 2. Loss of excitation current in the synchronous generator field winding
- ✗ 3. Reduction in paint thickness of alternator outer protective enclosure
- ✗ 4. Change in colour of lubricating oil storage tank surface coating

Q.91 **Which generator in wind turbines uses slip rings and a partially rated converter for variable-speed operation?**

Ans
- ✗ 1. permanent magnet synchronous generator
- ✗ 2. brushless DC generator
- ✗ 3. squirrel cage induction generator
- ✓ 4. doubly-fed induction generator

Q.92 **In a buck-boost converter, how does the inductor contribute to the inversion of the input voltage polarity while regulating the output voltage?**

Ans
- ✓ 1. The inductor stores energy from the input voltage and releases it in the opposite polarity during the 'off' phase of the switch.
- ✗ 2. The inductor filters out high-frequency noise from the input supply.
- ✗ 3. The inductor provides a low-impedance path for the return current.
- ✗ 4. The inductor acts as a transformer to invert the voltage polarity.

Q.93 **In a ring distribution system, what happens when there is a fault in one section?**

Ans
- ✗ 1. The receiving end voltage becomes more than the sending end voltage.
- ✓ 2. The power can be supplied through the alternate path.
- ✗ 3. The entire system is shut down.
- ✗ 4. The voltage drop increases significantly.

Q.94 **In a properly biased PNP transistor operating in active region, the emitter terminal is _____.**

Ans
- ✓ 1. more positive than the base
- ✗ 2. more negative than the collector
- ✗ 3. grounded permanently
- ✗ 4. equal in potential to the base

Q.95 **Which type of magnetic material loses its magnetism immediately after the removal of the magnetic field?**

Ans
- ✗ 1. Ferromagnetic
- ✓ 2. Paramagnetic
- ✗ 3. Ferrimagnetic
- ✗ 4. Diamagnetic

Q.96 **The tapping in an auto transformer is used to:**

Ans
- ✗ 1. reduce insulation
- ✗ 2. increase magnetic losses
- ✓ 3. regulate voltage output
- ✗ 4. separate windings

Q.97 **Which among the given statements correctly distinguishes Avalanche breakdown from Zener breakdown in a PN junction diode?**

Ans
- ✗ 1. Zener breakdown occurs only under forward bias conditions.
- ✗ 2. Avalanche breakdown does not result in a sharp increase in reverse current.
- ✗ 3. Zener breakdown voltage is typically higher than the avalanche breakdown voltage.
- ✓ 4. Avalanche breakdown is the predominant mechanism in lightly doped junctions.

Q.98 **For supplying a large three-phase load with neutral connection requirement, which transformer connection is generally preferred?**

Ans
- ✗ 1. Open delta connection for reduction of transformer copper losses
- ✗ 2. Delta-delta connection for single-phase domestic lighting systems
- ✗ 3. Scott connection for operation of balanced three-phase motor loads
- ✓ 4. Star-star connection with neutral grounding arrangement on both sides

Q.99 **Protection of transmission lines using differential pilot wire protection provides:**

Ans

✔ 1. Fast and selective protection of short transmission feeder sections

✘ 2. Reducing transmission line inductance under balanced operating conditions only

✘ 3. Increasing transmission conductor diameter during overload conditions

✘ 4. Improving illumination level inside substation control room sections

Q.100 **Which crystal structure is specifically associated with ferrite iron (α-iron), a ferromagnetic material?**

Ans

✘ 1. Diamond cubic

✘ 2. Face-centered cubic (FCC)

✔ 3. Body-centered cubic (BCC)

✘ 4. Hexagonal close-packed (HCP)

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