



रेलवे भर्ती बोर्ड / RAILWAY RECRUITMENT BOARDS
सीईएन - 05/25 - जेई, डीएमएस, सीएमए - CEN - 05/25 - JE, DMS, CMA



Test Date	02/07/2026
Test Time	9:00 AM - 11:00 AM
Subject / Exam Group	RRB JE Stage 2 CMA

* 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 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 retina moves forward and backward to adjust the focus ☒ 2. The iris controls the amount of light entering and helps to focus ☒ 3. The cornea provides all the focusing power required for clear vision ☒ 4. The eye lens changes its focal length by altering its shape through ciliary muscle action
Q.2	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. Enable multiple clocks ☒ 4. Set time zone globally
Q.3	The Mappila Uprisings of the 19 th century occurred mainly in which region of India?
Ans	☒ 1. Malabar region of Kerala ☒ 2. Sunderbans region of West Bengal ☒ 3. Konkan region of Maharashtra ☒ 4. Coromandel Coast of Tamil Nadu
Q.4	मुंबई में स्थित कौन-सी ब्रिटिश औपनिवेशिक इमारत, जिसका निर्माण 1888 में पूरा हुआ था, विक्टोरियन गोथिक और भारतीय स्थापत्य तत्वों के मिश्रण को प्रदर्शित करती है?
Ans	☒ 1. बॉम्बे टाउन हॉल ☒ 2. छत्रपति शिवाजी महाराज टर्मिनस ☒ 3. गेटवे ऑफ इंडिया ☒ 4. राजाबाई क्लॉक टॉवर
Q.5	Which Quick Style type is applied only to selected words or individual characters within a paragraph in MS Word 2010?
Ans	☒ 1. Paragraph styles ☒ 2. Page styles ☒ 3. Linked styles ☒ 4. Character styles

Q.6	The Atal Bhujal Yojana 2020 focused on improving water resources management of how many states?
Ans	☐ 1. five ☐ 2. ten ☐ 3. eight ☒ 4. seven

Q.14 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. Keep the fulcrum fixed at any point
 - ☐ 2. Move the fulcrum closer to the worker
 - ☒ 3. Move the fulcrum closer to the beam
 - ☐ 4. Place the fulcrum at the center of the plank

Q.15 What file extension is used to save an MS PowerPoint 2021 presentation?

- Ans**
- ☒ 1. .pptx
 - ☐ 2. .pdf
 - ☐ 3. .docx
 - ☐ 4. .xlsx

Q.16 Which of the following statements best describes the behavior of magnetic field lines around a straight current-carrying conductor?

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

Q.17 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. Cartosat-3
 - ☒ 2. CMS-03 (GSAT-7R)
 - ☐ 3. GSAT-6A
 - ☐ 4. RISAT-2B

Q.18 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 $\text{CaO(s)} + \text{H}_2\text{O(l)} \rightarrow \text{Ca(OH)}_2\text{(aq)} + \text{heat}$ is both a combination reaction and an exothermic reaction.

- Ans**
- ☐ 1. Only Statement I is correct
 - ☐ 2. Only Statement II is correct
 - ☒ 3. Both statements are correct
 - ☐ 4. Both statements are incorrect

Q.19 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, D Only
 - ☒ 2. A, B, C Only
 - ☐ 3. A only
 - ☐ 4. A, B Only

Q.20	Which of the following indicators is NOT typically used to measure sustainable development?
Ans	☐ 1. Ecological Footprint ☒ 2. Gross Domestic Product (GDP) growth rate ☐ 3. Human Development Index (HDI) ☐ 4. Biocapacity
Q.21	Which condition is required for a displacement reaction between a metal and salt solution?
Ans	☐ 1. Salt must be insoluble in water ☒ 2. Metal must be higher in reactivity series ☐ 3. Metal must be same as salt constituent ☐ 4. Reaction must be endothermic
Q.22	The primary goal of the Pradhan Mantri Gram Sadak Yojana (PMGSY) is to:
Ans	☒ 1. Provide rural connectivity through road construction ☐ 2. Enhance telecommunication services in cities ☐ 3. Promote renewable energy usage ☐ 4. Develop urban infrastructure
Q.23	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. Presenter View ☐ 2. Action Buttons ☒ 3. Rehearse Timings ☐ 4. Slide Sorter
Q.24	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 Vikrant ☐ 3. INS Ikshak ☐ 4. INS Arnala
Q.25	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 increasing speed ☒ 2. The box will move at a constant speed ☐ 3. The box will accelerate forward ☐ 4. The box will gradually come to rest
Q.26	The atmospheric component that remains largely unreactive is _____.
Ans	☐ 1. Methane ☐ 2. Carbon dioxide ☒ 3. Argon ☐ 4. Oxygen
Q.27	Which of the following statements is true about the Outbox?
Ans	☐ 1. It holds emails that have been successfully sent. ☐ 2. It contains emails that are currently being drafted. ☐ 3. It is used to receive incoming emails. ☒ 4. It temporarily stores emails that are queued for sending.

Q.28	Which pair of sectors is commonly addressed together in State Action Plan on Climate Change (SAPCC) adaptation planning?
Ans	☐ 1. Heavy industry and entertainment ☒ 2. Water resources and health systems ☐ 3. Textile design and fashion marketing ☐ 4. Information technology and space research
Q.29	What is the general formula of alkenes?
Ans	☒ 1. C_nH_{2n} ☐ 2. C_nH_{2n-2} ☐ 3. C_nH_n ☐ 4. C_nH_{2n+2}
Q.30	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. 10% ☐ 2. 25% ☐ 3. 20% ☒ 4. 15%
Q.31	Which type of computer virus attaches itself to executable files and gets activated when the file is run?
Ans	☐ 1. Macro Virus ☐ 2. Boot Sector Virus ☒ 3. File Infector Virus ☐ 4. Worm
Q.32	हम किसी बड़ी डायरेक्टरी में ज्ञात एक्सटेंशन वाली लेकिन अज्ञात नाम वाली फ़ाइल का पता कैसे लगा सकते हैं?
Ans	☐ 1. रीसायकल बिन (Recycle Bin) चेक करके ☒ 2. फ़ाइल एक्सप्लोरर (File Explorer) के सर्च बॉक्स (Search box) में *.ext का उपयोग करके ☐ 3. फ़ाइल एक्सप्लोरर (File Explorer) के माध्यम से ☐ 4. dir कमांड का उपयोग करके
Q.33	Which of the following rivers forms a delta along the eastern coastal plains?
Ans	☐ 1. Narmada ☐ 2. Tapi ☐ 3. Ganga ☒ 4. Godavari
Q.34	If 10 grams of salt are dissolved in 100 mL of water, which component is the solute?
Ans	☐ 1. Neither ☐ 2. Water only ☐ 3. Both salt and water ☒ 4. Salt only

Q.35	अस्पताल में बायोमेडिकल अपशिष्ट संचालकों (handlers) को व्यावसायिक संकट का खतरा होता है। उन्हें संक्रामक पदार्थों के संपर्क में आने से बचाने के लिए सबसे प्रभावी तरीका निम्नलिखित में से कौन-सा है?
Ans	☐ 1. अपशिष्ट को वर्ण-कोडित डिब्बे में पृथक करना ☐ 2. नियमित चिकित्सा जांच ☐ 3. सामान्य संक्रमणों के विरुद्ध टीकाकरण ☒ 4. सुरक्षात्मक उपस्कर और सुरक्षित हैंडलिंग का उपयोग
Q.36	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) (a) ☐ 2. Article 19 (1) (d) ☐ 3. Article 19 (1) (b) ☒ 4. Article 19 (1) (c)
Q.37	Which of the following best describes the velocity-time graph for an object moving with uniform velocity?
Ans	☐ 1. A curved line above the time axis ☐ 2. A line starting from the origin and sloping upwards ☐ 3. A straight line sloping upwards from the time axis ☒ 4. A straight horizontal line parallel to the time axis
Q.38	The Kol Rebellion (1831–32) mainly affected which plateau region?
Ans	☐ 1. Meghalaya Plateau ☒ 2. Chotanagpur Plateau ☐ 3. Deccan Plateau ☐ 4. Malwa Plateau
Q.39	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 soft iron core, increasing coil turns, and increasing current through the coil ☐ 3. Using a steel core, decreasing coil turns, and lowering current ☐ 4. Using an air core, decreasing coil turns, and keeping current constant
Q.40	Which function returns the smallest value?
Ans	☐ 1. AVERAGE ☐ 2. COUNT() ☒ 3. MIN() ☐ 4. MAX()
Q.41	According to Thomson's model, how are electrons arranged in an atom?
Ans	☐ 1. Randomly placed inside the nucleus ☒ 2. Embedded in a positively charged sphere like seeds in a watermelon ☐ 3. Moving in fixed orbits around the nucleus ☐ 4. Orbiting around neutrons in elliptical paths

Q.42 The primary method of managing biodegradable domestic waste after collection is _____.

- Ans
- ☐ 1. burnt in open air
 - ☐ 2. sending for recycling
 - ☐ 3. throwing into sewers
 - ☒ 4. conversion into compost

Q.43 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.44 Which experimental discovery contradicted Thomson's model of the atom and led to its rejection?

- Ans
- ☐ 1. Observation of line spectra of hydrogen by Bohr
 - ☐ 2. Measurement of atomic radius using X-ray diffraction
 - ☒ 3. Alpha particle scattering showing deflection at large angles
 - ☐ 4. Discovery of the neutron by James Chadwick

Q.45 अत्यधिक पीड़कनाशी के उपयोग से खेत में केंचुओं की संख्या में तीव्र कमी देखी जाती है। परिणामस्वरूप मृदा पर क्या प्रभाव पड़ता है?

- Ans
- ☒ 1. मृदा की उर्वरता (soil fertility) में कमी
 - ☐ 2. बेहतर वातन (Improved aeration)
 - ☐ 3. जल प्रतिधारण (water retention) में वृद्धि
 - ☐ 4. उन्नत अपघटन (Enhanced decomposition)

Q.46 निम्नलिखित कॉलमों का मिलान कीजिए।

क्षमादान अधिकार (Pardoning power)	प्रकार्य (Function)
1. लघूकरण (Commutation)	a. दंडादेश और दोषसिद्धि दोनों को रद्द करती है
2. प्रविलंबन (Reprieve)	b. विशेष मामलों में, मूल रूप से दिए गए दंडादेश को कम करती
3. विराम (Respite)	c. दंडादेश के स्वरूप को बदले बिना दंडादेश की अवधि को कम
4. परिहार (Remission)	d. किसी दंडादेश के कार्यान्वयन पर अस्थायी रोक लगाती है
5. क्षमा (Pardon)	e. दंड के एक रूप को उससे हल्के रूप में बदलती है

- Ans
- ☐ 1. 1-d, 2-b, 3-e, 4-c, 5-a
 - ☐ 2. 1-a, 2-c, 3-d, 4-e, 5-b
 - ☒ 3. 1-e, 2-d, 3-b, 4-c, 5-a
 - ☐ 4. 1-c, 2-e, 3-b, 4-a, 5-d

Q.47 Which of the following best describes how sound travels through air?

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

Q.48 On which date is National Handloom Day observed in India?

- Ans
- ☐ 1. 5 September
 - ☐ 2. 2 October
 - ☐ 3. 18 August
 - ☒ 4. 7 August

Q.49 If cell A1 = 10 and B1 = 20, what will `=A1+B1` return?

- Ans
- ☒ 1. 30
 - ☐ 2. Error
 - ☐ 3. 1020
 - ☐ 4. 200

Q.50 In a real-life scenario, a chemist discovers a compound with the formula $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_2\text{OH}$. What is the correct IUPAC name for this compound?

- Ans
- ☐ 1. 4-methylpentanol
 - ☐ 2. 3-methylhexanol
 - ☒ 3. 3-methylpentan-1-ol
 - ☐ 4. 2-methylhexanol

Section : Technical Abilities

Q.1 Which of the following is most relevant when discussing health-based international standards for drinking water?

- Ans
- ☐ 1. Permissible limits for water storage used in households
 - ☐ 2. Permissible limits for minerals present in drinking water
 - ☒ 3. Permissible limits for contaminants in water
 - ☐ 4. Permissible limits for temperature in drinking water

Q.2 एक रसायन विज्ञान के विद्यार्थी से यह समझाने के लिए कहा जाता है कि एथेनोइक अम्ल को अक्सर कसकर सील की गई बोतलों में क्यों संग्रहीत किया जाता है। एथेनोइक अम्ल का कौन-सा गुणधर्म इस भंडारण अभ्यास को सर्वाधिक उचित ठहराता है?

- Ans
- ☒ 1. एथेनोइक अम्ल वाष्पशील है और कसकर सील न होने पर वाष्पित हो सकता है
 - ☐ 2. कक्ष ताप पर वायु के संपर्क में आने पर एथेनोइक अम्ल ठोस हो जाता है
 - ☐ 3. एथेनोइक अम्ल तीव्रता से जल और कार्बन डाइऑक्साइड में अपघटित हो जाता है
 - ☐ 4. एथेनोइक अम्ल प्लास्टिक के साथ अभिक्रिया करके विषाक्त गैसों का निर्माण करता है

Q.3 The amplified output signal in a common emitter transistor amplifier is usually taken from _____.

- Ans
- ☐ 1. Base-emitter circuit
 - ☒ 2. Collector-emitter circuit
 - ☐ 3. Base terminal only
 - ☐ 4. Emitter terminal only

Q.4 Which of the following observations confirm a double displacement reaction?

- Ans
- ☒ 1. Formation of a precipitate when two solutions are mixed
 - ☐ 2. Formation of a single product from two reactants
 - ☐ 3. Release of hydrogen gas when metal reacts with acid
 - ☐ 4. Colour change due to displacement of metal

Q.5 What determines the reactivity of elements in chemical reactions?

- Ans
- ☒ 1. Reactivity depends on ease of electron loss or gain
 - ☐ 2. Reactivity remains constant for all chemical elements
 - ☐ 3. Reactivity independent of electron transfer in reactions
 - ☐ 4. Reactivity depends only on nuclear properties of atoms

Q.6	A particle moves 8 m east, then 15 m north, and finally 8 m west. What is the ratio of the total distance travelled to the magnitude of the net displacement?
Ans	✗ 1. 16:15 ✓ 2. 31:15 ✗ 3. 31:8 ✗ 4. 15:31
Q.7	A student observes that diamond and graphite are both made of the same element but have different properties. What is the element that makes up both substances?
Ans	✗ 1. Hydrogen ✗ 2. Oxygen ✓ 3. Carbon ✗ 4. Nitrogen
Q.8	A particle moves with uniform acceleration and has an initial velocity u. It covers distances s and 2s in two successive equal time intervals t. What is the acceleration of the particle?
Ans	✗ 1. $\frac{2s}{t^2}$ ✓ 2. $\frac{s}{t^2}$ ✗ 3. $\frac{3s}{4t^2}$ ✗ 4. $\frac{2s}{3t^2}$
Q.9	A student wants to compare the magnetic field patterns produced by a straight current-carrying wire and a current-carrying circular loop. Which experimental setup would best demonstrate the difference in their magnetic field lines?
Ans	✗ 1. Using a compass to detect direction of magnetic field at various points near the wire only ✗ 2. Measuring the force between two parallel wires carrying current in the same direction ✓ 3. Using iron filings around both the straight wire and the circular loop to visualize their magnetic field patterns ✗ 4. Placing a bar magnet near both conductors to observe attraction or repulsion
Q.10	What does the Aufbau principle state about electron filling in orbitals?
Ans	✗ 1. Orbitals filled randomly without energy consideration ✗ 2. Energy levels do not affect electron filling order ✓ 3. Lower energy orbitals filled before higher energy orbitals ✗ 4. Higher energy orbitals filled before lower energy orbitals
Q.11	If a hydrocarbon undergoes oxidation in the laboratory and a sweet-smelling liquid is produced, which class of compound is most likely formed?
Ans	✗ 1. A ketone is most likely formed during the reaction ✗ 2. An amide is most likely formed during the reaction ✗ 3. An alkene is most likely formed during the reaction ✓ 4. An ester is most likely formed during the reaction
Q.12	Which process is mainly responsible for ozone layer depletion in the stratosphere?
Ans	✗ 1. Industrial dust particles in the air ✗ 2. Urban heat island effect ✗ 3. Acid rain due to sulfur emissions ✓ 4. Reactions involving chlorofluorocarbons

Q.13	Which statement best explains how ionic radius varies with charge and electronic configuration of ions?
Ans	☒ 1. Higher positive charge leads to smaller ionic radius due to attraction ☐ 2. Ionic radius remains constant regardless of ionic charge or structure ☐ 3. Ionic charge has no influence on magnitude of ionic radius ☐ 4. Electronic configuration plays no role in determining ionic size
Q.14	Which of the following statements is INCORRECT regarding combination reactions?
Ans	☒ 1. All combination reactions are endothermic in nature ☐ 2. Burning of coal is an example of a combination reaction ☐ 3. Combination reactions form a single product from two or more reactants ☐ 4. CaO reacts with H₂O to form Ca(OH)₂ with release of heat
Q.15	Electric potential at a point is defined as the work done in bringing a unit positive charge from infinity to that point _____.
Ans	☒ 1. Without changing kinetic energy ☐ 2. With infinite acceleration always ☐ 3. Along a circular closed path ☐ 4. Only in magnetic fields
Q.16	A vehicle manufacturer is designing engines compatible with both petrol and alcohol-based fuels. What challenge must be addressed to ensure efficient engine performance with alcohol blends?
Ans	☐ 1. Alcohol remains completely immiscible with petroleum-based fuels ☒ 2. Alcohol tends to absorb water and corrode metallic engine parts ☐ 3. Alcohol shows complete resistance to combustion inside engines ☐ 4. Alcohol tends to freeze easily under normal room conditions
Q.17	Two circular current-carrying loops carry the same current but have different radii. Which loop produces the stronger magnetic field at its center?
Ans	☐ 1. Both loops produce the same magnetic field ☒ 2. The loop with smaller radius produces a larger magnetic field ☐ 3. The magnetic field at the center is zero ☐ 4. The loop with smaller radius produces a smaller magnetic field
Q.18	If the frequency of a sound wave increases while its speed in the medium remains unchanged, what happens to its wavelength?
Ans	☐ 1. Its wavelength remains the same. ☐ 2. Its wavelength becomes zero. ☒ 3. Its wavelength decreases. ☐ 4. Its wavelength increases.
Q.19	Two atoms having the same number of nucleons but different atomic numbers are called _____.
Ans	☐ 1. Isoelectronic particles only ☐ 2. Isotopes only ☒ 3. Isobars only ☐ 4. Isotones only

Q.20 A metal rod is tightly fitted between two rigid walls at room temperature. If the temperature increases, which outcome is most likely due to thermal expansion of solids?

- Ans**
- ☐ 1. The rod will remain unaffected by the temperature change.
 - ☐ 2. The rod will freely increase in length without stress.
 - ☒ 3. The rod will experience compressive stress and may buckle.
 - ☐ 4. The rod will be under tensile stress and stretch.

Q.21 A mixture contains two non-reacting gases A and B. If the partial pressures of A and B are 3 bar and 5 bar, respectively, what is the total pressure of the mixture?

- Ans**
- ☐ 1. 5 bar
 - ☐ 2. 2 bar
 - ☒ 3. 8 bar
 - ☐ 4. 15 bar

Q.22 Which statement correctly explains the modern periodic law of elements?

- Ans**
- ☐ 1. Atomic number has no effect on chemical properties
 - ☒ 2. Properties repeat periodically with increasing atomic number values
 - ☐ 3. Properties depend only on atomic mass values of elements
 - ☐ 4. Properties vary randomly without any periodic trend observed

Q.23 Which combination of objective and eyepiece focal lengths will result in the highest magnifying power for a simple astronomical telescope?

- Ans**
- ☒ 1. Short focal length eyepiece and long focal length objective
 - ☐ 2. Short focal length eyepiece and short focal length objective
 - ☐ 3. Long focal length eyepiece and short focal length objective
 - ☐ 4. Long focal length eyepiece and long focal length objective

Q.24 A chemist is analyzing an unknown organic sample. If the compound contains a benzene ring directly attached to a methyl group, how should the compound be classified based on its structure?

- Ans**
- ☐ 1. Open-chain alkene
 - ☐ 2. Aliphatic alcohol
 - ☒ 3. Aromatic hydrocarbon
 - ☐ 4. Cyclic ether

Q.25 According to the Heisenberg uncertainty principle, what happens when the precision in measuring position increases?

- Ans**
- ☐ 1. Measurements remain unaffected by uncertainty principle limits
 - ☐ 2. Uncertainty decreases for both variables simultaneously
 - ☐ 3. Both variables can be measured accurately simultaneously always
 - ☒ 4. Greater precision in one variable leads to greater uncertainty in other

Q.26 A cylinder fitted with a frictionless movable piston contains 2 moles of an ideal gas at 27°C and a volume of 10 L. The gas is heated to 127°C while maintaining constant pressure. What will be the final volume of the gas?

- Ans**
- ☐ 1. 15.0 L
 - ☒ 2. 13.3 L
 - ☐ 3. 12.0 L
 - ☐ 4. 10.8 L

Q.27 Two objects, one made of copper and the other of aluminum, are placed in thermal contact. Both have equal masses and are initially at different temperatures. Considering their specific heat capacities, which statement best describes what happens as they approach thermal equilibrium?

- Ans**
- ☐ 1. Both interacting objects experience entirely identical magnitudes of temperature shifts.
 - ☒ 2. The object with lower specific heat experiences larger temperature shifts.
 - ☐ 3. The object with higher specific heat experiences larger temperature shifts.
 - ☐ 4. Neither interacting object experiences any measurable variation in absolute temperature.

Q.28 For an sp^3 molecule with one lone pair, how and why does the bond angle change compared to the ideal tetrahedral angle?

- Ans**
- ☒ 1. The bond angle will decrease due to lone pair-bond pair repulsion
 - ☐ 2. The bond angle will increase due to electron sharing
 - ☐ 3. The bond angle will remain unchanged due to stable geometry
 - ☐ 4. The bond angle will decrease due to increased nucleus attraction

Q.29 Which of the following correctly describes a homogeneous mixture?

- Ans**
- ☐ 1. It forms separate layers on standing
 - ☐ 2. It contains only solid components
 - ☒ 3. It has uniform composition throughout
 - ☐ 4. It has visible particles that settle on standing

Q.30 The magnetic field lines around an infinitely long straight current-carrying wire are _____.

- Ans**
- ☐ 1. Radially outward directed lines
 - ☒ 2. Concentric circular paths
 - ☐ 3. Straight parallel lines only
 - ☐ 4. Elliptical closed trajectories

Q.31 Which of the following equations is dimensionally consistent?

- Ans**
- ☐ 1. Velocity = mass $\times$ time
 - ☐ 2. Energy = mass $\times$ velocity
 - ☐ 3. Power = force $\times$ time
 - ☒ 4. Force = mass $\times$ acceleration

Q.32 When a hot metal block is placed in a cooler liquid inside a calorimeter, which property of the metal primarily determines how readily heat is conducted through the block to its surface?

- Ans**
- ☒ 1. The thermal conductivity of the metal block
 - ☐ 2. The specific heat capacity of the metal block
 - ☐ 3. The internal density profile of the metal block
 - ☐ 4. The absolute volume metrics of the metal block

Q.33 The charge of an electron is best described as:

- Ans**
- ☐ 1. Sometimes positive charge under certain environmental conditions
 - ☐ 2. Variable charge depending on speed and energy conditions
 - ☒ 3. Constant negative charge independent of external physical conditions
 - ☐ 4. Charge depending on surrounding magnetic field conditions

Q.34	A new physical quantity 'Y' is defined by the equation $Y = \text{Power} \times \text{Time} / \text{Area}$. Which one of the following expressions correctly represents the dimensions of 'Y'?
Ans	✗ 1. $M L^{-2} T$ ✓ 2. $M T^{-2}$ ✗ 3. $M L^2 T^{-2}$ ✗ 4. $M T^{-1}$
Q.35	In the parallelogram method of vector addition, two vectors are drawn from the same point as adjacent sides of a parallelogram. What does the diagonal passing through the common point represent?
Ans	✗ 1. The average of the two vectors ✓ 2. The resultant vector in both magnitude and direction ✗ 3. The scalar sum of the two vectors ✗ 4. The difference between the two vectors
Q.36	A satellite is placed in a circular orbit around Earth at a fixed orbital radius. If the mass of the satellite is doubled while keeping the orbital radius unchanged, how does the gravitational force between Earth and the satellite change according to Newton's law of gravitation?
Ans	✗ 1. The gravitational force quadruples ✗ 2. The gravitational force halves ✓ 3. The gravitational force doubles ✗ 4. The gravitational force remains the same
Q.37	Cathode rays observed in discharge tubes are best described as:
Ans	✗ 1. Streams of photons emitted from heated metal electrodes ✗ 2. Streams of protons moving from anode toward cathode ✗ 3. Streams of neutrons moving randomly inside the tube ✓ 4. Streams of electrons moving from cathode toward anode
Q.38	Proton discovery is associated with which observation in discharge tube experiments?
Ans	✗ 1. Cathode rays contain negatively charged particles identified as protons ✗ 2. Canal rays contain neutral particles identified as neutrons ✗ 3. Cathode rays contain photons emitted from metal electrodes ✓ 4. Canal rays contain positively charged particles identified as protons
Q.39	Radioactive decay cannot be predicted exactly for a single nucleus because the process is _____.
Ans	✗ 1. Controlled by temperature only ✗ 2. Dependent on chemical state always ✓ 3. Random in nature ✗ 4. Completely deterministic
Q.40	A particle of mass m starts from rest and moves with constant acceleration 'a'. After travelling a distance 's', what is its kinetic energy?
Ans	✗ 1. $\frac{1}{2}ma^2$ ✓ 2. mas ✗ 3. 2mas ✗ 4. $\frac{1}{2}mas$

Q.41	The stability of the nucleus is mainly due to the balance between _____.
Ans	☐ 1. Electron attraction and neutron decay ☐ 2. Gravitational force and magnetic flux ☐ 3. Atomic volume and electric current ☒ 4. Nuclear attraction and proton repulsion
Q.42	Which of the following best explains how the thermal conductivity of a metal rod can be determined experimentally?
Ans	☐ 1. By enclosing the metallic structure inside a vacuum chamber and monitoring the resulting thermal radiation emissions over time. ☒ 2. By measuring the steady rate of heat flow through the metal rod when its boundaries are maintained at two distinct temperatures. ☐ 3. By evaluating the absolute volumetric mass density shifts of the metal rod samples before and after a prolonged thermal exposure. ☐ 4. By tracking the localized color variations along the metal rod surface when it undergoes direct heating at one focal terminal.
Q.43	Which of the following best explains why radio waves are suitable for long-distance communication compared to other regions of the electromagnetic spectrum?
Ans	☐ 1. Radio waves are the exclusive electromagnetic signals generated by electronic circuits. ☐ 2. Radio waves exhibit much higher energy per photon than optical frequency signals. ☒ 3. Radio waves are less likely to be absorbed or scattered by Earth's atmosphere. ☐ 4. Radio waves travel at significantly higher velocities through dense atmospheric layers.
Q.44	A company is designing a heating element and wants to reduce the resistance of a conductor. The material, temperature, and length of the conductor must remain unchanged. Which modification will most effectively decrease the resistance?
Ans	☐ 1. Raising the resistivity of the conductor ☐ 2. Decreasing the cross-sectional area of the conductor ☒ 3. Increasing the cross-sectional area of the conductor ☐ 4. Decreasing the resistivity of the conductor.
Q.45	Which of the following correctly explains a precipitation reaction?
Ans	☒ 1. Formation of an insoluble solid when two solutions are mixed ☐ 2. Formation of gas during a chemical reaction ☐ 3. Formation of a single product from two reactants ☐ 4. Breaking down of a compound into simpler substances
Q.46	According to the Kossel-Lewis approach, what is the main reason atoms form chemical bonds?
Ans	☐ 1. To maximize their energy states always ☒ 2. To achieve stable octets in their outermost shells ☐ 3. To increase their atomic mass significantly ☐ 4. To share electrons regardless of stability
Q.47	Which of the following correctly identifies an acid using litmus paper?
Ans	☐ 1. Turns red litmus blue ☐ 2. Turns blue litmus green ☒ 3. Turns blue litmus red ☐ 4. No change in red litmus

Q.48	Which combination of environmental factors would most likely accelerate the corrosion of an unprotected iron bridge?
Ans	✗ 1. Cold temperatures and low atmospheric pressure ✗ 2. Continuous sunlight with dry air exposure ✗ 3. Low humidity and absence of pollutants ✓ 4. High humidity and presence of acidic pollutants
Q.49	Which of the following statements correctly describes electric circuit diagrams? 1. They help in analyzing paths of electric current. 2. They provide a simplified representation of a circuit. 3. The symbols used in them should be standardized. 4. They eliminate the need for actual electrical components.
Ans	✗ 1. 1, 2, 3 and 4 ✓ 2. 1, 2 and 3 only ✗ 3. 2 and 4 only ✗ 4. 1 and 4 only
Q.50	A body of mass m is dropped from a height h. When it has fallen through a distance of $\frac{2h}{3}$, the ratio of its kinetic energy to potential energy is _____.
Ans	✗ 1. 3:1 ✓ 2. 2:1 ✗ 3. 1:2 ✗ 4. 1:1
Q.51	Why are half-filled orbitals considered more stable?
Ans	✗ 1. Half-filled orbitals are always less stable ✗ 2. Stability does not depend on electron arrangement ✓ 3. Equal electron distribution reduces repulsion in orbitals ✗ 4. Unequal electron distribution increases atomic instability
Q.52	Which scenario best demonstrates the cost-effective nature of green chemistry in industrial operations?
Ans	✗ 1. Lower raw material usage and increased waste generation during manufacturing ✗ 2. Higher raw material usage and reduced waste generation during manufacturing ✓ 3. Lower raw material usage and reduced waste generation during manufacturing ✗ 4. Higher raw material usage and increased waste generation during manufacturing
Q.53	एक सील किए हुए पात्र में समान तापमान पर हाइड्रोजन और ऑक्सीजन का बराबर द्रव्यमान भरा हुआ है। तापमान की गतिज व्याख्या का उपयोग करते हुए, दोनों प्रकार के गैस अणुओं की औसत गतिज ऊर्जा और चाल के बारे में क्या निष्कर्ष निकाला जा सकता है?
Ans	✗ 1. हाइड्रोजन के अणुओं की माध्य गतिज ऊर्जा अधिक है और साथ ही उच्च औसत वेग बनाए रखते हैं। ✗ 2. हाइड्रोजन के अणुओं की माध्य गतिज ऊर्जा अधिक हैं परंतु साथ ही समान औसत वेग बनाए रखते हैं। ✗ 3. दोनों गैसों की माध्य गतिज ऊर्जाएं समान हैं, परंतु ऑक्सीजन के भारी अणु उच्च औसत वेग बनाए रखते हैं। ✓ 4. दोनों गैसों की माध्य गतिज ऊर्जाएं समान हैं, परंतु हाइड्रोजन के हल्के अणु उच्च औसत वेग बनाए रखते हैं।
Q.54	Which functional group is commonly found in vinegar and gives it acidic properties?
Ans	✗ 1. Hydroxyl group ✗ 2. Ester group ✓ 3. Carboxyl group ✗ 4. Amino group

Q.55 A scientist is designing a concert hall to optimize acoustics. She wants the audience to perceive louder sounds without increasing the energy input from the speakers. Which characteristic of sound should she focus on modifying within the hall's design?

- Ans**
- ☐ 1. Frequency of the sound waves
 - ☐ 2. Wavelength of the sound waves
 - ☐ 3. Speed of sound in air
 - ☒ 4. Amplitude of the sound waves

Q.56 Stoichiometry in chemistry is mainly concerned with calculation of which of the following?

- Ans**
- ☐ 1. Calculations ignoring mole concept in chemical reaction analysis
 - ☒ 2. Reactant and product amounts using balanced chemical equations
 - ☐ 3. Physical properties of substances without chemical reaction calculations
 - ☐ 4. Reactions without using balanced chemical equation relationships

Q.57 Which statement best defines electron gain enthalpy for an isolated gaseous atom?

- Ans**
- ☐ 1. Energy released when atoms combine to form stable molecules
 - ☒ 2. Energy released or absorbed when isolated gaseous atom gains electron
 - ☐ 3. Energy required to remove electron from isolated gaseous atom completely
 - ☐ 4. Energy required to break bonds present in chemical compounds

Q.58 A car is at rest with its horn continuously sounding. If a person walks toward the car, how does the frequency of the sound heard by the person change?

- Ans**
- ☒ 1. The frequency increases
 - ☐ 2. The frequency remains unchanged
 - ☐ 3. The frequency decreases
 - ☐ 4. The frequency fluctuates continuously

Q.59 Which statement correctly explains the relationship between pH and hydronium ion concentration?

- Ans**
- ☒ 1. Higher the hydronium ion concentration, lower is the pH
 - ☐ 2. pH is independent of ion concentration
 - ☐ 3. Lower the hydronium ion concentration, lower is the pH
 - ☐ 4. Higher the hydronium ion concentration, higher is the pH

Q.60 Which of the following options best describes the behaviour of a transistor in the transition regions?

- Ans**
- ☐ 1. The collector current remains constant.
 - ☒ 2. The transistor shows non-linear behaviour due to gradual switching.
 - ☐ 3. The transistor does not conduct at all.
 - ☐ 4. The transistor has a perfectly linear response.

Q.61 A compass needle placed in a uniform magnetic field oscillates about its equilibrium position. What is the main reason for this behavior?

- Ans**
- ☐ 1. It experiences a net force
 - ☐ 2. It gains energy from the field continuously
 - ☒ 3. It experiences a torque
 - ☐ 4. The magnetic field is non-uniform

Q.62	Isotopes of the same element possess different atomic masses because they contain different numbers of _____.
Ans	✗ 1. Electrons in outer shell ✓ 2. Neutrons inside nucleus ✗ 3. Protons inside nucleus ✗ 4. Positive ions in orbit
Q.63	Three resistors of 2 Ω, 3 Ω, and 5 Ω are connected in series. What is their equivalent resistance?
Ans	✗ 1. 8 Ω ✗ 2. 9 Ω ✗ 3. 12 Ω ✓ 4. 10 Ω
Q.64	Which of the following situations can represent non-uniform motion of a particle?
Ans	✗ 1. A horizontal line in a velocity–time graph ✗ 2. Equal distances covered in equal intervals of time. ✗ 3. A straight-line distance–time graph with constant slope ✓ 4. A curved distance–time graph
Q.65	Which statement best explains origin of spectral lines from quantized electronic transitions in atoms?
Ans	✗ 1. Transitions occur between levels without any exchange of energy with surroundings ✗ 2. Spectral lines are independent of electronic configuration of atoms ✓ 3. Electrons jump between levels emitting or absorbing photons of specific energies ✗ 4. Electrons move continuously between levels without defined quantized energy states
Q.66	A diamond (n=2.42) is immersed in a transparent liquid. A light ray inside the diamond is incident at the critical angle at the diamond-liquid interface. If the refractive index of the liquid increases, what happens to the critical angle?
Ans	✗ 1. The critical angle remains unchanged as the refractive index of the liquid increases ✗ 2. The critical angle decreases as the refractive index of the liquid increases ✓ 3. The critical angle increases as the refractive index of the liquid increases ✗ 4. Total internal reflection occurs at all angles as the refractive index of the liquid increases
Q.67	Why does high-density polythene exhibit greater tensile strength than low-density polythene?
Ans	✗ 1. High-density polythene is manufactured at higher temperatures ✗ 2. Low-density polythene contains extensive cross-linked structures ✓ 3. High-density polythene contains linear and closely packed chains ✗ 4. Low-density polythene contains more amorphous chain regions
Q.68	A community water supply contains fluoride at 3 ppm. Which health effect is most likely to appear first among long-term consumers of this water?
Ans	✓ 1. Brown mottling of teeth due to excess fluoride exposure ✗ 2. Loss of tooth enamel due to complete fluoride absence ✗ 3. Severe skeletal deformities due to chronic fluoride exposure ✗ 4. Increased tooth decay due to inadequate fluoride exposure

Q.69 Plaster of Paris is prepared by heating which of the following substances?

- Ans**
- ☐ 1. Calcium hydroxide
 - ☒ 2. Gypsum
 - ☐ 3. Sodium chloride
 - ☐ 4. Calcium carbonate

Q.70 What do electron shells represent in atomic structure?

- Ans**
- ☐ 1. Electron shells do not exist in atoms
 - ☐ 2. All electrons have identical energy values
 - ☒ 3. Electrons occupy fixed energy level shells
 - ☐ 4. Electrons move randomly without defined shells

Q.71 Why is the net magnetic flux through any closed surface always zero?

- Ans**
- ☐ 1. Magnetic field lines are straight
 - ☐ 2. Electric charges cancel magnetic field
 - ☒ 3. Magnetic monopoles do not exist
 - ☐ 4. Magnetic field is weak

Q.72 According to the Aufbau principle, how are electrons distributed among atomic orbitals?

- Ans**
- ☐ 1. Electrons fill highest energy orbitals before lower ones
 - ☐ 2. Electrons occupy orbitals randomly without any energy order
 - ☐ 3. Orbital filling is independent of relative energy levels
 - ☒ 4. Filling occurs in order of increasing energy of orbitals

Q.73 Which statement correctly describes the strength of the bond in terms of orbital overlap?

- Ans**
- ☐ 1. Lesser orbital overlap forms a stronger covalent bond
 - ☒ 2. Greater orbital overlap forms a stronger covalent bond
 - ☐ 3. Partial orbital overlap forms an ionic bond
 - ☐ 4. Equal orbital overlap forms a weaker covalent bond

Q.74 Read the below Assertion and Reason and choose the correct option.
Assertion (A): Bleaching powder is used as an oxidising agent in chemical industries.
Reason (R): Bleaching powder is produced by the action of chlorine on dry slaked lime.

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

Q.75 Before breakdown, increasing reverse voltage causes reverse saturation current to _____.

- Ans**
- ☐ 1. Become exactly zero
 - ☐ 2. Increase rapidly from the beginning
 - ☒ 3. Remain approximately constant
 - ☐ 4. Change into forward current

Q.76 Which of the following statements correctly describe similarities between a bar magnet and a current-carrying solenoid?

- Both have North and South poles.
- Both produce a nearly uniform magnetic field inside.
- Both require permanent magnetic material only.
- Both follow the right-hand rule for determining the direction of the magnetic field.

- Ans
- ☒ 1. 1, 2, 3 and 4
 - ☒ 2. 1 and 3 only
 - ☒ 3. 2 and 3 only
 - ☒ 4. 1 and 2 only

Q.77 A copper ore is heated in the presence of air during metal extraction. What property of copper makes this process effective?

- Ans
- ☒ 1. Copper's low reactivity allows simple heating
 - ☒ 2. Copper readily combines with chlorine gas
 - ☒ 3. Copper requires strong reducing agents
 - ☒ 4. Copper forms soluble carbonates easily

Q.78 In the output characteristics of a transistor, the nearly horizontal curves indicate that collector current is _____.

- Ans
- ☒ 1. Alternating continuously
 - ☒ 2. Zero for all voltages
 - ☒ 3. Highly dependent on V_{CE}
 - ☒ 4. Nearly constant for fixed base current

Q.79 A molecule containing a hydroxyl group attached to a saturated carbon atom is most appropriately classified under which category?

- Ans
- ☒ 1. It is an aldehyde
 - ☒ 2. It is an ether
 - ☒ 3. It is an amide
 - ☒ 4. It is an alcohol

Q.80 एक खाद्य प्रसंस्करण कंपनी को अम्लीय खाद्य के भंडारण हेतु सामग्रियों का चयन करना है। संक्षारण को कम करने और दीर्घकालिक सुरक्षा सुनिश्चित करने के लिए कौन-सा तरीका सबसे उपयुक्त है?

- Ans
- ☒ 1. टैंकों के निर्माण के लिए स्टेनलेस स्टील का उपयोग करना
 - ☒ 2. आंतरिक भाग को अधात्विक रंगों से पेंट करना
 - ☒ 3. टैंक की भित्तियों पर एल्यूमिनियम स्ट्रिप्स लगाना
 - ☒ 4. टैंकों के अंदर सिलिका जेल पैकेट रखना

Q.81 In the formation of sp hybrid orbitals, what is the geometry adopted by a molecule such as BeCl_2 ?

- Ans
- ☒ 1. Linear
 - ☒ 2. Tetrahedral
 - ☒ 3. Trigonal planar
 - ☒ 4. Octahedral

Q.82 Which statement best explains why exchange energy stabilizes half-filled subshell configurations?

- Ans
- ☒ 1. Opposite spins create stronger exchange interactions increasing stability
 - ☒ 2. Stability depends only on nuclear attraction to electrons
 - ☒ 3. Exchange energy has no role in determining electronic stability
 - ☒ 4. Parallel spins allow exchange interactions increasing configuration stability

Q.83 A copper plate and an aluminum plate of equal thickness and area are maintained at the same temperature difference. If the thermal conductivity of copper is twice that of aluminum, what will be the ratio of heat flow through copper to that through aluminum?

- Ans**
- ☐ 1. The ratio will be 4:1 for copper to aluminum.
 - ☐ 2. The ratio will be 1:1 for copper to aluminum.
 - ☒ 3. The ratio will be 2:1 for copper to aluminum.
 - ☐ 4. The ratio will be 1:2 for copper to aluminum.

Q.84 The electric field outside a uniformly charged spherical shell behaves as if the _____.

- Ans**
- ☒ 1. Entire charge was concentrated at the center
 - ☐ 2. Field lines became circular around shell
 - ☐ 3. Electric fields were always zero everywhere
 - ☐ 4. Charges were uniformly spread in surrounding space

Q.85 Two vectors have equal magnitudes. If the magnitude of their resultant is equal to the magnitude of either vector, what is the angle between the two vectors?

- Ans**
- ☐ 1. 60°
 - ☐ 2. 30°
 - ☒ 3. 120°
 - ☐ 4. 180°

Q.86 Which molecule contains a central atom that has an incomplete octet in its Lewis structure and completes the octet by accepting a lone pair through coordinate bonding?

- Ans**
- ☒ 1. In the formation of the tetrafluoroborate ion from Boron trifluoride
 - ☐ 2. In the formation of the hydronium ion from water
 - ☐ 3. In the formation of carbonate ion from carbon dioxide
 - ☐ 4. In the formation of the ammonium ion from ammonia

Q.87 Which of the following statements correctly describe magnetic field lines around a bar magnet?

- Outside the magnet, field lines go from North to South.
- Inside the magnet, field lines go from North to South.
- Magnetic field lines always form closed loops.
- Magnetic field lines are discontinuous at the poles.

- Ans**
- ☐ 1. 1, 2, 3 and 4
 - ☒ 2. 1 and 3 only
 - ☐ 3. 1, 2 and 4 only
 - ☐ 4. 2 and 3 only

Q.88 Which of the following statements best explains how the speed of sound changes when it travels from air into water?

- Ans**
- ☐ 1. Sound cannot travel through water at all because it is a liquid and not a gas.
 - ☐ 2. Sound travels at the same speed in both air and water because both are fluids with similar properties.
 - ☐ 3. Sound travels slower in water than in air because water particles are further apart, making transmission more difficult.
 - ☒ 4. Sound travels faster in water than in air because water particles are closer together, enabling quicker transmission of vibrations.

Q.89 Which observation confirms a displacement reaction when an iron nail is placed in copper sulphate solution?

- Ans**
- ☒ 1. Blue solution turns green and brown coating forms on iron
 - ☐ 2. A white precipitate is formed in the solution
 - ☐ 3. Blue solution turns colourless with no change in iron
 - ☐ 4. No colour change and no reaction occurs

Q.90 Which equation below is NOT dimensionally consistent?

- Ans
- ☒ 1. $s = (v^2 - u^2)/2a$
 - ☒ 2. $s = ut^2 + (1/2) at$
 - ☒ 3. $s = vt$
 - ☒ 4. $s = ut + (1/2) at^2$

Q.91 उच्चतर कक्षाओं में बोर त्रिज्या बढ़ जाती है क्योंकि इलेक्ट्रॉन _____।

- Ans
- ☒ 1. धनावेश प्राप्त कर लेता है
 - ☒ 2. अपनी संपूर्ण गतिज ऊर्जा खो देता है
 - ☒ 3. पूर्णतः परिक्रमा करना बंद कर देता है
 - ☒ 4. नाभिक से अधिक दूर गति करता है

Q.92 Read the following Assertion (A) and Reason (R) carefully and choose the correct option.

Assertion (A): Dry HCl gas does not show acidic behaviour.
Reason (R): HCl produces hydrogen ions only in the presence of water.

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

Q.93 You have three test tubes: one with dilute HCl, one with NaOH solution, and one with distilled water. Using both red and blue litmus papers, which observation correctly identifies the test tube containing the acidic solution?

- Ans
- ☒ 1. No change in both red and blue litmus
 - ☒ 2. No change in red, turns blue litmus red
 - ☒ 3. Turns red litmus blue
 - ☒ 4. Turns both red and blue litmus blue

Q.94 The existence of cut-in voltage in a diode is mainly due to the presence of _____.

- Ans
- ☒ 1. Infinite conductivity
 - ☒ 2. Neutral atoms without charges
 - ☒ 3. Depletion barrier potential
 - ☒ 4. External magnetic field only

Q.95 Why is molality preferred over molarity in colligative property calculations under varying temperature conditions?

- Ans
- ☒ 1. Molality depends directly on solution volume changes with temperature
 - ☒ 2. Molarity remains unaffected by temperature changes unlike molality values
 - ☒ 3. Molality remains unaffected by temperature changes unlike molarity values
 - ☒ 4. Both molality and molarity remain unaffected by temperature variations

Q.96 The spectral lines in a hydrogen series become closer together because the energy levels at higher n values _____.

- Ans
- ☒ 1. Remain equally spaced
 - ☒ 2. Become farther apart
 - ☒ 3. Become closer together
 - ☒ 4. Disappear completely

Q.97 Which process uses oil and water to separate valuable minerals from impurities during ore concentration?

- Ans**
- ☐ 1. Electrolytic refining method
 - ☐ 2. Leaching process
 - ☐ 3. Magnetic separation method
 - ☒ 4. Froth flotation method

Q.98 Beta decay helps unstable nuclei achieve stability mainly by adjusting the _____.

- Ans**
- ☒ 1. Neutron-proton ratio
 - ☐ 2. Electron orbital speed only
 - ☐ 3. Atomic radius only
 - ☐ 4. Nuclear volume to infinity

Q.99 What happens to a plane wavefront after reflecting from a concave mirror whose principal axis is perpendicular to the incident wavefront?

- Ans**
- ☐ 1. It retains its structural orientation to emerge as a flat plane wavefront moving along the parallel axis.
 - ☐ 2. It breaks apart into irregular fragments to emerge as a highly scattered wave moving in random paths.
 - ☒ 3. It undergoes a shape transition to emerge as a spherical wavefront converging toward a focal point.
 - ☐ 4. It undergoes a shape transition to emerge as a spherical wavefront expanding outward toward infinity.

Q.100 Which of the following correctly describes the gaseous state of matter?

- Ans**
- ☐ 1. Particles are close but can move around
 - ☐ 2. Particles have definite shape and volume
 - ☒ 3. Particles are far apart and move freely
 - ☐ 4. Particles are very close and fixed in position