TSD

"EDUCATE, ELEVATE, EMPOWER"

SCIENCE

2024-25

Grade 11 & 12

Q 1 : Which of the following organelles is primarily responsible for the modification and packaging of proteins synthesized in the rough endoplasmic reticulum?

A. Golgi apparatus

B. Lysosome

C. Smooth endoplasmic reticulum

D. Peroxisome

Q 2 : In the context of cell membrane structure, the term 'fluid mosaic model' refers to:

A. A rigid arrangement of phospholipids and proteins

B. A static lipid bilayer with embedded carbohydrates

C. A dynamic phospholipid bilayer with dispersed proteins

D. A solid layer of lipids with fixed protein channels

Q 3 : The primary distinction between prokaryotic and eukaryotic cells lies in the:

A. Presence of a cell wall

B. Size of ribosomes

C. Absence of a true nucleus in prokaryotes

D. Mode of reproduction

Q 4 : Mitochondria and chloroplasts share several features that support the endosymbiotic theory, including:

A. Presence of linear DNA

B. Ability to self-replicate and double membranes

C. Association with the rough endoplasmic reticulum

D. Existence within the nucleoplasm

Q 5 : During the G1 phase of the cell cycle, a cell:

A. Replicates its DNA

B. Synthesizes proteins and grows rapidly

C. Undergoes mitosis

D. Prepares for cytokinesis

Q 6 : The semi-autonomous nature of mitochondria is evidenced by their ability to:

A. Generate ATP through glycolysis

B. Produce proteins using their own ribosomes

C. Exist independently outside the cell

D. Divide synchronously with the cell nucleus

Q 7 : In plant cells, the plasmodesmata function primarily to:

A. Facilitate photosynthesis

B. Store nutrients

C. Enable intercellular communication

D. Provide structural support

Q 8 : The role of ribosomes in a cell is to:

A. Transcribe DNA into RNA

B. Translate mRNA into polypeptides

C. Modify proteins post-translation

D. Degrade malfunctioning proteins

Q 9 : Which of the following statements about ideal gases is correct?

A. They have strong intermolecular forces.

B. Their particles occupy significant volume.

C. They condense into liquids at low temperatures.

D. Their collisions are perfectly elastic.

Q 10 : The deviation of real gases from ideal behavior is most significant under conditions of:

A. High temperature and low pressure.

B. Low temperature and high pressure.

C. High temperature and high pressure.

D. Low temperature and low pressure.

Q 11 : In the kinetic molecular theory, the average kinetic energy of gas molecules is directly proportional to:

A. The pressure of the gas.

B. The volume of the gas.

C. The absolute temperature of the gas.

D. The number of moles of gas.

Q 12 : Which of the following changes will increase the vapor pressure of a liquid?

A. Decreasing the temperature.

B. Increasing the atmospheric pressure.

C. Decreasing the surface area.

D. Increasing the temperature.

Q 13 : The critical temperature of a substance is defined as the temperature above which:

A. The substance cannot exist in the liquid state.

B. The substance cannot exist in the gaseous state.

C. The solid and liquid phases are in equilibrium.

D. The vapor pressure equals atmospheric pressure.

Q 14 : When a solid changes directly into a gas without passing through the liquid phase, the process is called:

A. Condensation.

B. Deposition.

C. Sublimation.

D. Melting.

Q 15 : Which of the following best explains why liquids have a definite volume but no definite shape?

A. The particles are in fixed positions.

B. The particles are far apart and move randomly.

C. The particles can slide past each other but are closely packed.

D. The particles have high kinetic energy.

Q 16 : The triple point of a substance is the temperature and pressure at which:

A. Solid and liquid phases are in equilibrium.

B. Liquid and gas phases are in equilibrium.

C. Solid, liquid, and gas phases coexist in equilibrium.

D. Solid and gas phases are in equilibrium.

Q 17 : A car accelerates uniformly from rest to a speed of 20 m/s in 5 seconds. What is the distance traveled during this time?

A. 50 m

B. 100 m

C. 150 m

D. 200 m

Q 18 : A 5 kg object is acted upon by a net force of 20 N. What is the acceleration of the object?

A. 2 m/s^2

B. 3 m/s^2

C. 4 m/s^2

D. 5 m/s^2

Q 19 : Which of the following statements is true about an object in uniform circular motion?

A. Its velocity is constant.

B. Its acceleration is zero.

C. The net force on the object is zero.

D. The net force is directed towards the center of the circle.

Q 20 : A block of mass 10 kg is pulled up a 30° incline with a force of 100 N parallel to the incline. If the coefficient of kinetic friction is 0.2, what is the acceleration of the block?

A. $2\ m/s^2$

B. $3\ m/s^2$

C. $4\ m/s^2$

D. $5\ m/s^2$

Q 21 : A pendulum has a period of 2 seconds on Earth. What would be its period on the Moon, where the acceleration due to gravity is 1/6th that of Earth?

A. $2\sqrt{6}$ s

B. $2/\sqrt{6}$ s

C. $2\sqrt{3}$ s

D. $2\sqrt{2}$ s

Q 22 : A 0.5 kg ball is dropped from a height of 10 m. Ignoring air resistance, what is its speed just before it hits the ground?

A. 10 m/s

B. 14 m/s

C. 20 m/s

D. $\sqrt{(2gh)}$ m/s

Q 23 : Which of the following is a non-conservative force?

A. Gravitational force

B. Electric force

C. Spring force

D. Frictional force

Q 24 : A 2 kg object moving at 3 m/s collides elastically with a stationary 1 kg object. What is the speed of the 1 kg object after the collision?

A. 1 m/s

B. 2 m/s

C. 3 m/s

D. 4 m/s

Q 25 : Which inorganic ion can act as a cofactor for amylase?

A. OH^-

B. $PO4^{3-}$

C. Cl^-

D. $HCO3^-$

Q 26 : Which of the following factors does not affect the shape of the active site of an enzyme?

A. A drop in temperature

B. Non-competitive inhibitor

C. A change in pH

D. Binding of substrate

Q 27 : Enzymes function optimally in detergents at temperatures between 20 and 60°C and within a pH range of 7–10.5. The most widely used detergent enzymes efficiently break down protein, carbohydrate, and fat stains. If a washing cycle is set to run at 40°C and pH 8, which row best describes what is happening?

A. Protease: condensation of peptide bonds; Carbohydrase: condensation of glycosidic bonds; Lipase: condensation of ester bonds

B. Protease: condensation of peptide bonds; Carbohydrase: hydrolysis of peptide bonds; Lipase: hydrolysis of ester bonds

C. Protease: hydrolysis of peptide bonds; Carbohydrase: hydrolysis of glycosidic bonds; Lipase: hydrolysis of ester bonds

D. Protease: condensation of glycosidic bonds; Carbohydrase: hydrolysis of ester bonds; Lipase: hydrolysis of peptide bonds

Q 28 : Which of the following best describes the role of a catalyst?

A. It increases the activation energy of a reaction.

B. It decreases the activation energy of a reaction.

C. It alters the equilibrium position of a reaction.

D. It is consumed during the reaction.

Q 29 : Which enzyme has the greatest effect on organism development?

A. Amylase

B. Lipase

C. Protease

D. Methyltransferase

Q 30 : Two enzymes, X and Y, were used in an experiment. Enzyme X was from bacteria that live in rivers and lakes at temperatures from 5°C to 20°C. Enzyme Y was from bacteria that live in hot springs at temperatures from 50°C to 80°C. Which statement is correct?

A. Enzyme X has a higher optimum temperature than enzyme Y.

B. Enzyme Y has a higher optimum temperature than enzyme X.

C. Both enzymes have the same optimum temperature.

D. Enzyme X is more heat-stable than enzyme Y.

Q 31 : Which of the following statements is true about enzyme inhibitors?

A. Competitive inhibitors bind to the allosteric site.

B. Non-competitive inhibitors bind to the active site.

C. Competitive inhibitors increase the maximum reaction rate.

D. Non-competitive inhibitors decrease the maximum reaction rate.

Q 32 : Which statement correctly describes the effect of pH on enzyme activity?

A. All enzymes have the same optimal pH.

B. Extreme pH levels can denature enzymes by altering their tertiary structure.

C. Enzymes are not affected by changes in pH.

D. Enzymes function best at a pH of 7.

Q 33 : Which of the following statements about isotopes is correct?

A. Isotopes of an element have different numbers of protons.

B. Isotopes of an element have identical physical properties.

C. Isotopes of an element have different chemical properties.

D. Isotopes of an element have the same number of electrons.

Q 34 : The first ionization energy generally increases across Period 3 of the periodic table. Which element deviates from this trend?

A. Sodium

B. Magnesium

C. Aluminum

D. Sulfur

Q 35 : Which of the following compounds exhibits both ionic and covalent bonding?

A. Sodium chloride

B. Ammonium nitrate

C. Methane

D. Carbon dioxide

Q 36 : The bond angle in a molecule with a trigonal planar shape is approximately:

A. 90°

B. 109.5°

C. 120°

D. 180°

Q 37 : Which of the following species has a square planar molecular geometry?

A. CH_4

B. PF_5

C. SF_4

D. $[Ni(CN)_4]^{2-}$

Q 38 : The electron configuration of a transition metal ion is [Ar] 3d□. The ion is:

A. Fe^{2+}

B. Mn^{2+}

C. Cr^{3+}

D. Co^{2+}

Q 39 : Which of the following statements about metallic bonding is incorrect?

A. Metals have high melting points due to strong electrostatic attractions.

B. Metals are good conductors of electricity because of delocalized electrons.

C. Metals are malleable due to layers of ions that can slide over each other.

D. Metals are brittle because of directional bonds.

Q 40 : In the reaction between aluminum and chlorine to form aluminum chloride, the oxidation state of aluminum changes from:

A. 0 to +1

B. 0 to +2

C. 0 to +3

D. +3 to 0

Q 41 : Which of the following statements about the zeroth law of thermodynamics is correct?

A. It defines the concept of internal energy.

B. It establishes the concept of entropy.

C. It states that energy cannot be created or destroyed.

D. It implies that if two systems are each in thermal equilibrium with a third system, they are in thermal equilibrium with each other.

Q 42 : A gas undergoes an isothermal expansion. Which of the following remains constant during this process?

A. Pressure

B. Volume

C. Temperature

D. Internal energy

Q 43 : The root mean square speed of gas molecules is directly proportional to:

A. The square of the absolute temperature

B. The square root of the absolute temperature

C. The absolute temperature

D. The inverse of the absolute temperature

Q 44 : Which of the following best describes the concept of thermal equilibrium?

A. Two systems in thermal contact exchange matter until their masses are equal.

B. Two systems in thermal contact exchange energy until their temperatures are equal.

C. Two systems in thermal contact exchange volume until their densities are equal.

D. Two systems in thermal contact exchange pressure until their pressures are equal.

Q 45 : In an adiabatic process, which of the following is true?

A. Heat is transferred into the system.

B. Heat is transferred out of the system.

C. No heat is transferred into or out of the system.

D. The temperature of the system remains constant.

Q 46 : The specific heat capacity of a substance is defined as:

A. The amount of heat required to raise the temperature of a unit mass of the substance by one degree Celsius.

B. The amount of heat required to raise the temperature of the substance by one degree Celsius.

C. The amount of heat required to change the state of the substance without changing its temperature.

D. The amount of heat required to raise the temperature of a unit volume of the substance by one degree Celsius.

Q 47 : Which of the following statements about entropy is correct?

A. Entropy is a measure of the total energy of a system.

B. Entropy is a measure of the disorder or randomness of a system.

C. Entropy is conserved in all natural processes.

D. Entropy decreases in all spontaneous processes.

Q 48 : The first law of thermodynamics is a statement of:

A. The conservation of momentum.

B. The conservation of mass.

C. The conservation of energy.

D. The increase of entropy.

Q 49 : The process of water movement through a plant and its evaporation from aerial parts is known as _____.

A. Translocation

B. Respiration

C. Transpiration

D. Osmosis

Q 50 : Which ion is actively transported into root hair cells to enable water uptake by osmosis?

A. Calcium ions

B. Magnesium ions

C. Potassium ions

D. Nitrate ions

Q 51 : The _____ hypothesis explains the transport of sucrose in the phloem.

A. Root pressure

B. Cohesion-tension

C. Pressure flow

D. Capillarity

Q 52 : Chlorosis, caused by the lack of magnesium, directly affects the production of _____.

A. ATP

B. Chlorophyll

C. Proteins

D. Starch

Q 53 : The movement of water through the apoplast pathway is prevented by the _____ in the endodermis.

A. Plasmodesmata

B. Casparian strip

C. Xylem vessels

D. Phloem sieve plates

Q 54 : In xerophytes, reduced leaf size and thick _____ help in minimizing water loss.

A. Phloem layers

B. Spongy mesophyll

C. Cuticle

D. Root hairs

Q 55 : The main driving force for the upward movement of water in plants is:

A. Root pressure

B. Osmosis in root hairs

C. Capillary action

D. Transpiration pull

Q 56 : The stomatal opening is regulated by the _____ of guard cells.

A. Osmotic potential

B. Water uptake

C. Chloroplast density

D. Turgor pressure

Q 57 : Calculate the number of moles in 22.4 dm^3 of nitrogen gas at standard temperature and pressure (STP).

A. 0.5 moles

B. 1 mole

C. 2 moles

D. 1.5 moles

Q 58 : When 4.0 g of hydrogen reacts with 32.0 g of oxygen, how many grams of water are produced?

A. 18 g

B. 36 g

C. 34 g

D. 36.0 g

Q 59 : What is the empirical formula of a compound containing 40% carbon, 6.7% hydrogen, and 53.3% oxygen by mass?

A. CH_2O

B. $C_2H_4O_2$

C. CHO

D. $C_3H_6O_3$

Q 60 : If 0.5 moles of aluminum react with excess hydrochloric acid, how many moles of hydrogen gas are produced?

A. 0.5 moles

B. 1 mole

C. 1.5 moles

D. 2 moles

Q 61 : Determine the limiting reagent when 2 moles of nitrogen react with 5 moles of hydrogen to produce ammonia.

A. Nitrogen

B. Hydrogen

C. Ammonia

D. None

Q 62 : Calculate the mass of carbon dioxide produced when 10 g of methane is burned completely in oxygen.

A. 22 g

B. 25 g

C. 27.5 g

D. 30 g

Q 63 : How many moles of electrons are required to reduce 1 mole of Fe^{3+} ions to Fe^{2+} ions?

A. 0.5 moles

B. 1 mole

C. 1.5 moles

D. 2 moles

Q 64 : What volume of 0.5 M sulfuric acid is required to neutralize 25 cm^3 of 1 M sodium hydroxide?

A. 12.5 cm^3

B. 25 cm^3

C. 50 cm^3

D. 37.5 cm^3

Q 65 : The wavelength of a sound wave is the distance between two consecutive _____.

A. Crests

B. Troughs

C. Nodes

D. Peaks

Q 66 : The speed of a wave is determined by the product of its frequency and _____.

A. Amplitude

B. Wavelength

C. Period

D. Velocity

Q 67 : The equation for the velocity of a wave is given by _____.

A. $v = \lambda \times f$

B. $v = \lambda \div f$

C. $v = f \div \lambda$

D. $v = \lambda + f$

Q 68 : 4. When two waves meet, the resulting displacement is the _____ of the individual displacements.

A. Average

B. Sum

C. Difference

D. Product

Q 69 : The frequency of a wave is defined as the number of oscillations per _____.

A. Minute

B. Second

C. Wave

D. Unit

Q 70 : A wave travels with a velocity of 5 m/s and a frequency of 2 Hz. The wavelength of the wave is _____.

A. 10 m

B. 2.5 m

C. 1 m

D. 0.5 m

Q 71 : The refraction of light occurs when it passes from one medium to another due to a change in _____.

A. Amplitude

B. Speed

C. Wavelength

D. Frequency

Q 72 : The energy of a wave is directly proportional to the square of its _____.

A. Amplitude

B. Speed

C. Frequency

D. Wavelength

Q 73 : Which of the following is a primary source of energy for human cells?

A. Proteins

B. Lipids

C. Vitamins

D. Carbohydrates

Q 74 : The process of digestion begins in the _____.

A. Stomach

B. Small intestine

C. Mouth

D. Large intestine

Q 75 : Which vitamin deficiency causes scurvy?

A. Vitamin A

B. Vitamin C

C. Vitamin D

D. Vitamin E

Q 76 : The enzyme amylase breaks down _____.

A. Lipids

B. Proteins

C. Carbohydrates

D. Starch

Q 77 : What is the role of bile in digestion?

A. It emulsifies fats

B. Breaks down proteins

C. Absorbs nutrients

D. Stores carbohydrates

Q 78 : The mineral that is important for the formation of hemoglobin is _____.

A. Magnesium

B. Zinc

C. Iron

D. Calcium

Q 79 : The absorption of nutrients primarily takes place in the _____.

A. Stomach

B. Esophagus

C. Large intestine

D. Small intestine

Q 80 : A deficiency of which of the following nutrients can lead to rickets?

A. Vitamin C

B. Calcium

C. Vitamin D

D. Phosphorus

Q 81 : The primary site of gas exchange in the human lungs is the _____.

A. Bronchi

B. Trachea

C. Alveoli

D. Bronchioles

Q 82 : Oxygen diffuses from the alveoli into the bloodstream due to a difference in _____.

A. Temperature

B. Pressure

C. Concentration

D. Volume

Q 83 : During inhalation, the diaphragm moves _____.

A. Upward

B. Outward

C. Downward

D. Inward

Q 84 : The main function of hemoglobin in the blood is to _____.

A. Transport carbon dioxide

B. Regulate pH levels

C. Carry oxygen

D. Help in clotting

Q 85 : In the human respiratory system, the exchange of gases occurs between the

alveoli and _____.

A. Capillaries

B. Arteries

C. Veins

D. Lymph vessels

Q 86 : The process by which carbon dioxide is removed from the blood in the lungs is called _____.

A. Filtration

B. Exhalation

C. Reabsorption

D. Carbonation

Q 87 : The volume of air moved in and out of the lungs during normal breathing is called _____.

A. Tidal volume

B. Residual volume

C. Vital capacity

D. Total lung capacity

Q 88 : During the process of gas exchange, oxygen binds to _____ in the blood.

A. White blood cells

B. Platelets

C. Red blood cells

D. Plasma

Q 89 : The enthalpy change for the reaction is positive, indicating that the reaction is _____.

A. Exothermic

B. Endothermic

C. Spontaneous

D. Irreversible

Q 90 : In an exothermic reaction, the energy released to the surroundings is _____ the energy absorbed.

A. Equal to

B. Greater than

C. Less than

D. Unrelated to

Q 91 : The enthalpy change of combustion for a substance is defined as the energy released when _____.

A. One mole is decomposed

B. One mole is burned in excess oxygen

C. One mole is reacted with water

D. One mole is formed from its elements

Q 92 : A reaction has a negative Gibbs free energy (ΔG). This suggests that the reaction is _____.

A. At equilibrium

B. Spontaneous

C. Non-spontaneous

D. Reversible

Q 93 : In a calorimeter, the heat absorbed or released during a reaction is measured by the change in _____.

A. Pressure

B. Volume

C. Temperature

D. Energy

Q 94 : The specific heat capacity of a substance is the amount of heat required to raise the temperature of _____ by one degree Celsius.

A. 1 kg of the substance

B. 1 mole of the substance

C. 100 g of the substance

D. 1 liter of the substance

Q 95 : If the activation energy of a reaction is lowered by a catalyst, the rate of the reaction will _____.

A. Increase

B. Decrease

C. Remain the same

D. Become unpredictable

Q 96 : In an endothermic reaction, the products have _____ energy than the reactants.

A. More

B. Equal

C. Less

D. Unchanged

Q 97 : The potential difference across a resistor is 12V, and the current through it is 4A. The resistance of the resistor is _____.

A. 3 Ω

B. 12 Ω

C. 48 Ω

D. 4 Ω

Q 98 : The resistance of a conductor is inversely proportional to its _____.

A. Length

B. Cross-sectional area

C. Temperature

D. Voltage

Q 99 : If the total resistance in a parallel circuit is 2 Ω and one of the resistors has a resistance of 4 Ω, the resistance of the second resistor is _____.

A. 6 Ω

B. 2 Ω

C. 1.33 Ω

D. 8 Ω

Q 100 : The power dissipated in a resistor is directly proportional to the square of the _____.

A. Voltage

B. Current

C. Resistance

D. Length

Q 101 : Ohm's law states that the current through a conductor is directly proportional to the _____.

A. Temperature

B. Voltage

C. Resistance

D. Power

Q 102 : The energy used by a circuit can be calculated by the formula _____.

A. $E = I^2Rt$

B. $P = IV$

C. $C = I^2R$

D. $V = IR$

Q 103 : In a series circuit, the total resistance is the _____.

A. Sum of individual resistances

B. Reciprocal of the sum of the resistances

C. Product of individual resistances

D. Average of individual resistances

Q 104 : The resistance of a filament lamp increases as the temperature _____.

A. Increases

B. Decreases

C. Stays constant

D. Varies irregularly

Q 105 : The process by which oxygen moves from the alveoli into the blood is known as _____.

A. Phagocytosis

B. Diffusion

C. Active transport

D. Filtration

Q 106 : The partial pressure of oxygen is higher in the _____ compared to the pulmonary capillaries.

A. Alveoli

B. Veins

C. Arteries

D. Interstitium

Q 107 : Hemoglobin's affinity for oxygen is affected by _____.

A. Temperature

B. Partial pressure of carbon dioxide

C. Sodium concentration

D. All of the above

Q 108 : The main function of the surfactant in the alveoli is to _____.

A. Increase surface area

B. Reduce friction

C. Increase surface tension

D. Reduce surface tension

Q 109 : The majority of carbon dioxide in the blood is carried as _____.

A. Bicarbonate ions

B. Carbonic acid

C. Carbaminohemoglobin

D. Carbon dioxide dissolved in plasma

Q 110 : During external respiration, the diffusion of gases occurs due to the differences in _____.

A. Concentration gradients

B. Partial pressure gradients

C. Temperature gradients

D. Volume gradients

Q 111 : In the human respiratory system, the volume of air remaining in the lungs after maximal exhalation is called _____.

A. Tidal volume

B. Residual volume

C. Vital capacity

D. Total lung capacity

Q 112 : The Bohr effect describes the phenomenon where an increase in _____ causes a rightward shift in the oxygen dissociation curve.

A. Temperature

B. Carbon dioxide concentration

C. pH level

D. Chlorine concentration

Q 113 : The rate of a chemical reaction is influenced by all of the following except _____.

A. Temperature

B. Concentration of reactants

C. Catalysts

D. Pressure in a solid-phase reaction

Q 114 : When a reaction reaches equilibrium, the rate of the forward reaction _____.

A. Increases

B. Decreases

C. Becomes zero

D. Equals the rate of the reverse reaction

Q 115 : The change in enthalpy (ΔH) of a reaction is positive for a _____ reaction.

A. Exothermic

B. Reversible

C. Exergonic

D. Endothermic

Q 116 : In a redox reaction, the substance that gains electrons is _____.

A. Oxidized

B. Reduced

C. Neutralized

D. Neither oxidized nor reduced

Q 117 : The activation energy of a reaction is the energy required to _____.

A. Initiate the reaction

B. Convert products into reactants

C. Break the bonds of reactants

D. Overcome the heat of the reaction

Q 118 : In a combustion reaction, oxygen combines with a substance to form _____.

A. Water

B. Carbon dioxide

C. Energy

D. A new element

Q 119 : The principle of Le Chatelier's Principle is used to predict the effect of _____ on a system at equilibrium.

A. Temperature changes

B. Pressure changes

C. Concentration changes

D. All of the above

Q 120 : In a displacement reaction, the more reactive metal displaces the _____.

A. Least reactive metal

B. Most reactive non-metal

C. Least reactive non-metal

D. Most reactive metal

Q 121 : The mass defect of a nucleus is due to the conversion of mass into _____.

A. Energy

B. Protons

C. Neutrons

D. Photons

Q 122 : The energy released in a fission reaction is primarily due to the conversion of _____.

A. Neutron energy

B. Kinetic energy of fragments

C. Binding energy

D. Internal energy

Q 123 : The half-life of a radioactive substance is the time taken for _____.

A. Half of the substance to decay

B. All the atoms to decay

C. Half of the atoms to become stable

D. The decay rate to increase by half

Q 124 : The process of nuclear fusion is primarily responsible for energy production in _____.

A. Power plants

B. Nuclear bombs

C. The Sun

D. All of the above

Q 125 : In alpha decay, the atomic number of the parent nucleus decreases by _____.

A. 1

B. 2

C. 3

D. 4

Q 126 : The most penetrating type of radiation is _____.

A. Alpha particles

B. Beta particles

C. Gamma rays

D. X-rays

Q 127 : The binding energy per nucleon of an iron nucleus is highest because iron is the most _____ element.

A. Stable

B. Reactive

C. Radioactive

D. Energy-efficient

Q 128 : In a nuclear reactor, the role of a moderator is to _____.

A. Slow down neutrons

B. Increase the neutron flux

C. Absorb radiation

D. Prevent fission reactions

Q 129 : In aerobic respiration, the final electron acceptor in the electron transport chain is _____.

A. Oxygen

B. Carbon dioxide

C. Water

D. Glucose

Q 130 : The process of glycolysis occurs in the _____.

A. Mitochondria

B. Cytoplasm

C. Chloroplast

D. Nucleus

Q 131 : The net ATP yield from one molecule of glucose in anaerobic respiration is _____.

A. 2 ATP

B. 4 ATP

C. 36 ATP

D. 38 ATP

Q 132 : In the Krebs cycle, the molecule that is initially formed by the combination of acetyl-CoA and oxaloacetate is _____.

A. Citrate

B. Glucose

C. Pyruvate

D. Acetyl-CoA

Q 133 : The role of NADH and FADH2 in cellular respiration is to _____.

A. Donate electrons to the electron transport chain

B. Produce ATP in glycolysis

C. Act as enzymes

D. Convert glucose into pyruvate

Q 134 : The main purpose of fermentation in yeast cells is to _____.

A. Regenerate NAD+

B. Produce ATP

C. Produce oxygen

D. Break down glucose into pyruvate

Q 135 : Which of the following is a product of both aerobic and anaerobic respiration?

A. Carbon dioxide

B. Water

C. ATP

D. Glucose

Q 136 : The chemiosmotic theory explains how ATP is produced during _____.

A. Glycolysis

B. Oxidative phosphorylation

C. The Krebs cycle

D. Fermentation

Q 137 : The movement of oxygen from the alveoli into the blood is an example of _____.

A. Active transport

B. Simple diffusion

C. Facilitated diffusion

D. Osmosis

Q 138 : The heart's pacemaker, which controls the heart rate, is the _____.

A. Bundle of His

B. SA node

C. AV node

D. Purkinje fibers

Q 139 : The role of hemoglobin in blood is to _____.

A. Transport carbon dioxide

B. Help in immune response

C. Carry oxygen

D. Transport nutrients

Q 140 : Which of the following is responsible for the clotting of blood?

A. Red blood cells

B. Platelets

C. White blood cells

D. Plasma

Q 141 : The circulation of blood from the heart to the lungs and back is called _____.

A. Systemic circulation

B. Pulmonary circulation

C. Coronary circulation

D. Lymphatic circulation

Q 142 : The composition of plasma includes all of the following except _____.

A. Water

B. Ions

C. Proteins

D. Red blood cells

Q 143 : The heart muscle receives its oxygen and nutrients through the _____.

A. Coronary arteries

B. Pulmonary veins

C. Carotid arteries

D. Aorta

Q 144 : The function of the valve in the heart is to _____.

A. Prevent backflow of blood

B. Increase blood pressure

C. Allow blood to flow in any direction

D. Regulate heartbeat

Q 145 : The pH of a neutral solution at 25°C is _____.

A. 7

B. 0

C. 14

D. 8

Q 146 : Which of the following acids is monoprotic?

A. Phosphoric acid

B. Sulfuric acid

C. Hydrochloric acid

D. Nitric acid

Q 147 : A strong acid differs from a weak acid in that a strong acid _____.

A. Partially dissociates in water

B. Completely dissociates in water

C. Has a higher pH

D. Produces fewer hydrogen ions

Q 148 : When an acid reacts with a base, the products formed are _____.

A. Water and salt

B. Water and hydrogen gas

C. Carbon dioxide and salt

D. Water and oxygen

Q 149 : The ion responsible for the acidic properties of a solution is _____.

A. OH^-

B. H_2O

C. H^+

D. Na^+

Q 150 : A solution has a pH of 5. The solution is _____.

A. Neutral

B. Acidic

C. Basic

D. Alkaline

Q 151 : Which of the following is a weak base?

A. Ammonia

B. Potassium hydroxide

C. Sodium hydroxide

D. Calcium hydroxide

Q 152 : Which salt is formed when hydrochloric acid reacts with sodium hydroxide?

A. Sodium sulfate

B. Sodium chloride

C. Sodium nitrate

D. Sodium acetate

Q 153 : The element with the highest ionization energy in Period 3 is _____.

A. Sodium

B. Magnesium

C. Aluminum

D. Silicon

Q 154 : Which of the following elements is a metalloid?

A. Sodium

B. Silicon

C. Chlorine

D. Potassium

Q 155 : The atomic radius of elements generally _____ across a period.

A. Increases

B. Decreases

C. Remains constant

D. Fluctuates

Q 156 : Which of the following groups contains elements that have full outer electron shells?

A. Group 1

B. Group 17

C. Group 18

D. Group 2

Q 157 : The element that has a similar chemical behavior to chlorine is _____.

A. Fluorine

B. Sulfur

C. Argon

D. Bromine

Q 158 : Which element in Group 17 is least reactive?

A. Iodine

B. Chlorine

C. Fluorine

D. Bromine

Q 159 : The transition metals are found in which block of the periodic table?

A. s-Block

B. p-Block

C. d-Block

D. f-Block

Q 160 : An element with the electron configuration [Ne]$3s^2 3p^{\square}$ belongs to Group _____.

A. 1

B. 2

C. 17

D. 18

Q 161 : The main effect of narcotic drugs on the human body is _____.

A. Increase in heart rate

B. Stimulation of the central nervous system

C. Relief of pain

D. Slowed down respiratory function

Q 162 : Which of the following drugs is classified as a hallucinogen?

A. Morphine

B. Ecstasy

C. Heroin

D. LSD

Q 163 : The primary function of beta-blockers is to _____.

A. Increase heart rate

B. Lower blood pressure

C. Stimulate the nervous system

D. Reduce inflammation

Q 164 : Which of the following is a long-term effect of alcohol abuse?

A. Liver damage

B. Improved immune function

C. Reduced heart rate

D. Enhanced cognitive abilities

Q 165 : The mechanism of action of amphetamines involves the release of which neurotransmitter?

A. Dopamine

B. Acetylcholine

C. Serotonin

D. GABA

Q 166 : Nicotine primarily affects the body by _____.

A. Decreasing blood pressure

B. Stimulating the release of adrenaline

C. Decreasing heart rate

D. Relaxing the smooth muscles

Q 167 : The drug that blocks the reuptake of serotonin, norepinephrine, and dopamine is known as a _____.

A. Stimulant

B. Depressant

C. SSRI

D. Tricyclic antidepressant

Q 168 : Which of the following is NOT a common side effect of opioid drugs?

A. Pain relief

B. Respiratory depression

C. Constipation

D. Memory enhancement

Q 169 : Which metal reacts with oxygen to form an amphoteric oxide?

A. Sodium

B. Copper

C. Aluminum

D. Zinc

Q 170 : The metal that does not form cations in solution is _____.

A. Copper

B. Magnesium

C. Potassium

D. Silver

Q 171 : Which of the following metals is known for its ability to conduct electricity at very high temperatures?

A. Tungsten

B. Copper

C. Silver

D. Platinum

Q 172 : The process of extracting a metal from its ore by heating it with carbon is called _____.

A. Reduction

B. Oxidation

C. Electrolysis

D. Smelting

Q 173 : Which of the following is the most reactive metal in the periodic table?

A. Lithium

B. Potassium

C. Sodium

D. Cesium

Q 174 : When a metal reacts with dilute hydrochloric acid, it produces hydrogen gas. Which metal would react the slowest?

A. Iron

B. Zinc

C. Copper

D. Magnesium

Q 175 : Which of the following is a characteristic property of transition metals?

A. High reactivity

B. Low melting points

C. Ability to form colored compounds

D. Low density

Q 176 : Which of the following hormones is responsible for the fight-or-flight response?

A. Adrenaline

B. Insulin

C. Thyroxine

D. Prolactin

Q 177 : The part of the brain responsible for regulating heart rate and breathing is the _____.

A. Cerebrum

B. Cerebellum

C. Medulla Oblongata

D. Hypothalamus

Q 178 : In the human nervous system, the synapse is the gap between a(n) _____ and a(n) _____.

A. Axon and dendrite

B. Dendrite and axon

C. Sensory neuron and motor neuron

D. Neuron and effector

Q 179 : Which of the following is NOT a function of the autonomic nervous system?

A. Regulation of blood pressure

B. Control of voluntary muscles

C. Control of digestion

D. Regulation of heart rate

Q 180 : The reflex arc involves the transmission of nerve impulses from the sensory receptor to the spinal cord and then to the effector. What is the order of the nerve pathway?

A. Sensory neuron → Motor neuron → Relay neuron → Effector

B. Relay neuron → Sensory neuron → Motor neuron → Effector

C. Sensory neuron → Relay neuron → Motor neuron → Effector

D. Sensory neuron → Motor neuron → Relay neuron → Effector

Q 181 : In the human eye, the adjustment of the lens for focusing on near or distant objects is controlled by the _____.

A. Ciliary body

B. Iris

C. Sclera

D. Retina

Q 182 : The secretion of insulin by the pancreas is regulated by _____.

A. The hypothalamus

B. The medulla oblongata

C. The anterior pituitary gland

D. The blood glucose concentration

Q 183 : Which of the following is a major greenhouse gas responsible for global warming?

A. Methane

B. Carbon dioxide

C. Nitrous oxide

D. Ozone

Q 184 : The process of denitrification in the nitrogen cycle is carried out by _____.

A. Nitrifying bacteria

B. Ammonifying bacteria

C. Denitrifying bacteria

D. Azotobacter

Q 185 : Which chemical compound is responsible for the depletion of the ozone layer?

A. Carbon dioxide

B. Chlorofluorocarbons (CFCs)

C. Oxides of nitrogen

D. Sulfur dioxide

Q 186 : In the water cycle, the process in which water vapor changes directly into a solid state is called _____.

A. Condensation

B. Evaporation

C. Precipitation

D. Sublimation

Q 187 : The term 'acid rain' refers to rainwater with a pH lower than _____.

A. 5.0

B. 6.0

C. 4.0

D. 7.0

Q 188 : Which of the following pollutants is primarily responsible for the formation of photochemical smog?

A. Carbon monoxide

B. Sulfur dioxide

C. Nitrogen oxides

D. Chlorofluorocarbons (CFCs)

Q 189 : The BOD (biochemical oxygen demand) of a water sample is a measure of _____.

A. The concentration of oxygen required by bacteria to decompose organic material in water

B. Total dissolved oxygen in the water

C. The amount of light penetrating the water

D. Concentration of suspended particles in the water

Q 190 : Which of the following techniques is used to amplify a specific segment of DNA?

A. Polymerase chain reaction (PCR)

B. Genetic sequencing

C. Restriction digestion

D. Cloning

Q 191 : The process of inserting a gene from one organism into the DNA of another organism is known as _____.

A. Genetic mutation

B. Genetic modification

C. Gene cloning

D. Gene editing

Q 192 : In genetic modification, the enzyme used to cut DNA at specific sequences is called _____.

A. Reverse transcriptase

B. Polymerase

C. Restriction endonuclease

D. Ligase

Q 193 : A genetically modified organism (GMO) may contain genes that confer resistance to _____.

A. Herbicides

B. Pesticides

C. Antibiotics

D. All of the above

Q 194 : Which of the following is a potential risk associated with genetic modification of organisms?

A. Ethical concerns

B. Disease resistance

C. Overproduction of crops

D. All of the above

Q 195 : The functional group present in an aldehyde is _____.

A. –OH

B. –COOH

C. –CHO

D. –C=O

Q 196 : The reaction between an alcohol and a carboxylic acid to form an ester is known as _____.

A. Oxidation

B. Reduction

C. Condensation

D. Hydrolysis

Q 197 : Ethene reacts with bromine in the presence of light to form _____.

A. Bromethane

B. Ethanol

C. 1,2-Dibromoethane

D. Propane

Q 198 : CH3-CH2-CH2-CHO is named as _____ in IUPAC nomenclature.

A. Propyl aldehyde

B. Butanal

C. Propionaldehyde

D. Ethanol

Q 199 : Among methane, propane, butane, and hexane, _____ has the highest boiling point.

A. Methane

B. Propane

C. Butane

D. Hexane

Q 200 : Symbiosis refers to a relationship where organisms _____.

A. Live in isolation

B. Live together for mutual benefit

C. Compete for resources

D. One benefits, and the other is harmed

Q 201 : The term “niche” in ecology refers to _____.

A. The physical space an organism occupies

B. The role or function of an organism in its ecosystem

C. The distribution of species across habitats

D. The competition between organisms

Q 202 : In mutualism, both organisms _____.

A. Benefit from the relationship

B. Are harmed equally

C. Are unaffected by each other

D. One benefits while the other is harmed

Q 203 : A relationship where one organism benefits while the other is neither harmed nor benefited is called _____.

A. Parasitism

B. Commensalism

C. Mutualism

D. Competition

Q 204 : Predation involves _____.

A. A relationship where one organism feeds on another

B. Two organisms living together for mutual benefit

C. A relationship where both organisms are equally benefited

D. Competition for resources

Answers Key

Q 1 :	A	Q 28 :	B	Q 55 :	D	Q 82 :	C	Q 109 :	A
Q 2 :	C	Q 29 :	D	Q 56 :	D	Q 83 :	C	Q 110 :	B
Q 3 :	C	Q 30 :	B	Q 57 :	B	Q 84 :	C	Q 111 :	B
Q 4 :	B	Q 31 :	D	Q 58 :	B	Q 85 :	A	Q 112 :	B
Q 5 :	B	Q 32 :	B	Q 59 :	A	Q 86 :	B	Q 113 :	D
Q 6 :	B	Q 33 :	D	Q 60 :	A	Q 87 :	A	Q 114 :	D
Q 7 :	C	Q 34 :	D	Q 61 :	B	Q 88 :	C	Q 115 :	D
Q 8 :	B	Q 35 :	B	Q 62 :	C	Q 89 :	B	Q 116 :	B
Q 9 :	D	Q 36 :	C	Q 63 :	B	Q 90 :	A	Q 117 :	A
Q 10 :	B	Q 37 :	D	Q 64 :	A	Q 91 :	B	Q 118 :	B
Q 11 :	C	Q 38 :	B	Q 65 :	A	Q 92 :	B	Q 119 :	D
Q 12 :	D	Q 39 :	D	Q 66 :	B	Q 93 :	C	Q 120 :	A
Q 13 :	A	Q 40 :	C	Q 67 :	A	Q 94 :	A	Q 121 :	A
Q 14 :	C	Q 41 :	D	Q 68 :	B	Q 95 :	A	Q 122 :	C
Q 15 :	C	Q 42 :	C	Q 69 :	B	Q 96 :	A	Q 123 :	A
Q 16 :	C	Q 43 :	B	Q 70 :	A	Q 97 :	D	Q 124 :	C
Q 17 :	B	Q 44 :	B	Q 71 :	B	Q 98 :	B	Q 125 :	B
Q 18 :	C	Q 45 :	C	Q 72 :	A	Q 99 :	C	Q 126 :	C
Q 19 :	D	Q 46 :	A	Q 73 :	D	Q 100 :	B	Q 127 :	A
Q 20 :	A	Q 47 :	B	Q 74 :	C	Q 101 :	B	Q 128 :	A
Q 21 :	C	Q 48 :	C	Q 75 :	B	Q 102 :	A	Q 129 :	A
Q 22 :	B	Q 49 :	C	Q 76 :	D	Q 103 :	A	Q 130 :	B
Q 23 :	D	Q 50 :	D	Q 77 :	A	Q 104 :	A	Q 131 :	A
Q 24 :	D	Q 51 :	C	Q 78 :	C	Q 105 :	B	Q 132 :	A
Q 25 :	C	Q 52 :	B	Q 79 :	D	Q 106 :	A	Q 133 :	A
Q 26 :	A	Q 53 :	B	Q 80 :	C	Q 107 :	D	Q 134 :	A
Q 27 :	C	Q 54 :	C	Q 81 :	C	Q 108 :	D	Q 135 :	C

Q 136 :	B	Q 165 :	A	Q 194 :	A
Q 137 :	B	Q 166 :	B	Q 195 :	C
Q 138 :	B	Q 167 :	D	Q 196 :	C
Q 139 :	C	Q 168 :	D	Q 197 :	C
Q 140 :	B	Q 169 :	C	Q 198 :	B
Q 141 :	B	Q 170 :	A	Q 199 :	D
Q 142 :	D	Q 171 :	A	Q 200 :	B
Q 143 :	A	Q 172 :	D	Q 201 :	B
Q 144 :	A	Q 173 :	D	Q 202 :	A
Q 145 :	A	Q 174 :	C	Q 203 :	B
Q 146 :	C	Q 175 :	C	Q 204 :	A
Q 147 :	B	Q 176 :	A		
Q 148 :	A	Q 177 :	C		
Q 149 :	C	Q 178 :	B		
Q 150 :	B	Q 179 :	B		
Q 151 :	A	Q 180 :	C		
Q 152 :	B	Q 181 :	A		
Q 153 :	D	Q 182 :	D		
Q 154 :	B	Q 183 :	B		
Q 155 :	B	Q 184 :	C		
Q 156 :	C	Q 185 :	B		
Q 157 :	D	Q 186 :	D		
Q 158 :	A	Q 187 :	C		
Q 159 :	C	Q 188 :	C		
Q 160 :	C	Q 189 :	A		
Q 161 :	C	Q 190 :	A		
Q 162 :	D	Q 191 :	B		
Q 163 :	B	Q 192 :	C		
Q 164 :	A	Q 193 :	D