

BIOLOGY

- 1) Sickle cell anemia occurs due to:
 - A) Change in β chain
 - B) Change in α chain
 - C) Change in both chains
 - D) Deletion of amino acid
- 2) Condensation reaction between two monosaccharides will:
 - A) Add water
 - B) Break glycosidic bond
 - C) Remove water
 - D) Add oxygen
- 3) Molecular formula $C_3H_6O_3$ represents a:
 - A) Pentose
 - B) Tetrose
 - C) Triose
 - D) Hexose
- 4) Functional role of hemoglobin is mainly:
 - A) Structural support
 - B) Oxygen transport
 - C) Enzymatic activity
 - D) Hormonal signaling
- 5) The function of the cardiovascular system is:
 - A) Respiration
 - B) Transport of substance
 - C) Digestion
 - D) Excretion
- 6) In α -helix, hydrogen bond is formed between:
 - A) Side chains
 - B) Adjacent amino acids
 - C) Carbonyl O of one and amino H of fourth next residue
 - D) R groups only
- 7) After ring formation, which carbon becomes new chiral center in glucose?
 - A) C-2
 - B) C-3
 - C) C-4
 - D) C-1
- 8) Anomeric carbon in fructose:
 - A) C-1
 - B) C-2
 - C) C-3
 - D) C-4
- 9) Dry weight of cell mainly consists of:
 - A) Biomolecules
 - B) Water
 - C) Only proteins
 - D) Only carbohydrates
- 10) Blood pressure is highest in:
 - A) Veins
 - B) Capillaries
 - C) Arteries
 - D) Venules
- 11) Glycogen is more branched than amylopectin because it has:
 - A) More α -1,4 bonds
 - B) More β bonds
 - C) More α -1,6 bonds
 - D) Fewer glucose units
- 12) DNA probes are used to:
 - A) Measure heart rate
 - B) Detect complementary DNA sequences
 - C) Produce insulin
 - D) Measure blood sugar
- 13) The flower color of Four O'clock plant is an example of:
 - A) Codominance
 - B) Complete dominance
 - C) Incomplete dominance
 - D) Polygenic inheritance
- 14) In a monohybrid cross ($Aa \times Aa$), the phenotypic ratio is:
 - A) 1:2:1
 - B) 3:1
 - C) 9:3:3:1
 - D) 2:1

- 15) Which vessels connect arteries and veins:
- A) Arterioles
B) Capillaries
C) Vanules
D) Lymph vessels
- 16) A Y-linked trait is transmitted from:
- A) Mother to son
B) Father to daughter
C) Father to son only
D) Mother to daughter
- 17) Formation of lysosomes depends on the Golgi apparatus because:
- A) Golgi packages hydrolytic enzymes into vesicles
B) Golgi produces catalase for lysosomes
C) Golgi synthesizes DNA for lysosomal function
D) Lysosomes are fragments of Golgi membrane
- 18) Purines in DNA are:
- A) Adenine and Cytosine
B) Adenine and Guanine
C) Cytosine and Thymine
D) Thymine and Guanine
- 19) Formation of enzyme-substrate complex results in:
- A) Increase in activation energy
B) Decrease in activation energy of reaction
C) Permanent change in enzyme
D) Destruction of substrate
- 20) Which blood group is universal recipient:
- A) A
B) B
C) AB
D) O
- 21) Sarcoplasmic reticulum mainly stores:
- A) Sodium ions
B) Potassium ions
C) Chloride ions
D) Calcium ions
- 22) RER is well developed in:
- A) Secretory cells
B) Fat cells
C) Muscle cells
D) Red blood cells
- 23) Which layer of the heart wall is also known as the visceral pericardium?
- A) Epicardium
B) Myocardium
C) Endocardium
D) Fibrous pericardium
- 24) Structural rigidity in plant cell wall is mainly due to:
- A) α -1,4 linkage
B) β -1,4 linkage
C) α -1,2 linkage
D) None of them
- 25) Which of the following statements regarding the "pay-off" phase of glycolysis is INCORRECT?
- A) It results in the production of 4 ATP molecules per glucose molecule.
B) It involves the oxidation of Glyceraldehyde-3-phosphate
C) It consumes 2 molecules of NAD^+ to produce 2 molecules of NADH
D) It requires the presence of oxygen to proceed in the cytoplasm
- 26) If a cell is treated with a toxin that specifically inhibits the enzyme Enolase, which of the following intermediates will likely increase in concentration?
- A) Phosphoenolpyruvate (PEP)
B) 2-phosphoglycerate (2-PGA)
C) 3-phosphoglycerate (3-PGA)
D) Pyruvic acid
- 27) The right side of heart contain:
- A) Oxygenated blood
B) Deoxygenated blood
C) Mixed blood
D) No blood
- 28) A blood clot that forms and remains attached to the wall of an unbroken blood vessel is called a
- A) Thrombus
B) Embolus
C) Coagulum
D) Plaque

29) Some enzymes are made of RNA and are called:

- A) Ribozymes
- B) Apoenzymes
- C) Coenzymes
- D) Allosteric enzymes

30) In 1935, who showed that viruses could be crystallized and that these crystals consist largely of proteins?

- A) D.J. Ivanosky
- B) M.W. Beijerinck
- C) W.M. Stanley
- D) T.O. Diener

31) The outer layer of plant cell wall is:

- A) Secondary wall
- B) Primary wall
- C) Middle lamella
- D) Plasma membrane

32) The exchange of nutrients, gases, and waste products between blood and tissue cells occurs only at the level of:

- A) Arterioles
- B) Venules
- C) Capillaries
- D) None of them

33) "Retro-viruses" (like HIV) are unique in their structure because they carry which enzyme to convert RNA into DNA?

- A) DNA Polymerase
- B) RNA Polymerase
- C) Reverse Transcriptase
- D) Lysozyme

34) The lifespan of RCB is about:

- A) 20 Days
- B) 50 Days
- C) 120 Days
- D) 200 Days

35) DNA stability increases with:

- A) G–C pairing
- B) A–T pairing
- C) Uracil presence
- D) Ribose sugar

36) Chordae tendineae are found in:

- A) Atria of the heart
- B) Ventricles of the heart
- C) Joints of legs
- D) Ventricles of the brain

37) The progressive decrease in the number of which cells leads to the onset of AIDS symptoms?

- A) Helper T-lymphocytes
- B) Suppressor T-cells
- C) Natural Killer cells
- D) Platelets

38) The axial skeleton consists of:

- A) Skull, vertebral column, ribs and sternum
- B) Skull and limbs only
- C) Pectoral girdle and pelvic girdle
- D) Limbs and girdle only

39) The main function of platelets is:

- A) Oxygen transport
- B) Immunity
- C) Clotting
- D) Transport Hormones

40) Implantation of the embryo normally occurs in the

- A) Ovary
- B) Cervix
- C) Endometrium of uterus
- D) Vagina

41) Which blood vessel carries filtered blood away from the glomerulus?

- A) Renal artery
- B) Afferent article
- C) Renal vein
- D) Efferent article

42) Lacteals absorb

- A) Amino Acid
- B) Glucose
- C) Fat
- D) Minerals

- 56) Human skin color is mainly determined by the amount of:
- A) Hemoglobin
 - B) Melanin
 - C) Keratin
 - D) Collagen
- 57) Haversian canals mainly contain:
- A) Air
 - B) Cartilage
 - C) Fat only
 - D) Blood vessels and nerves
- 58) The wrist bones are collectively called:
- A) Carpals
 - B) Tarsals
 - C) Metacarpals
 - D) Phalanges
- 59) Which division increases heart rate?
- A) Parasympathetic
 - B) Sympathetic
 - C) Somatic
 - D) Sensory
- 60) Which molecule binds to calcium ions (Ca^{2+}) to initiate muscle contraction?
- A) Myosin
 - B) Actin
 - C) Tropomyosin
 - D) Troponin
- 61) Which genotype represents a color-blind male?
- A) $\text{X}^{\text{N}}\text{X}^{\text{N}}$
 - B) $\text{X}^{\text{N}}\text{X}^{\text{n}}$
 - C) $\text{X}^{\text{n}}\text{Y}$
 - D) $\text{X}^{\text{N}}\text{Y}$
- 62) The color of oxygenated blood is:
- A) Dark red
 - B) Light red
 - C) Blue
 - D) Yellow
- 63) Binding of hemoglobin with oxygen is catalyzed by the enzyme:
- A) Carbonic anhydrase
 - B) Carboxylase
 - C) Oxygenase
 - D) Dehydrogenase
- 64) The transfer of phosphate from one compound to another compound requires an enzyme called:
- A) Oxidoreductase
 - B) Transferase
 - C) Hydrolase
 - D) Ligase
- 65) When antibodies produced by B-cells kill the antigens, it is called:
- A) Cell mediated response
 - B) Passive response
 - C) Humoral response
 - D) Cells collaborated response
- 66) B-Lymphocytes are formed and matured in:
- A) Liver
 - B) Spleen
 - C) Bone marrow
 - D) Thymus
- 67) Which part of the small intestine is responsible for nutrient absorption?
- A) Duodenum
 - B) Jejunum
 - C) Ileum
 - D) Rectum
- 68) Water can circulate in living organisms due to:
- A) Surface tension and polarity
 - B) Cohesion and adhesion
 - C) Solubility in cells
 - D) Stable liquid range
- 69) Optimum temperature for most human enzymes is approximately:
- A) 20°C
 - B) 37°C
 - C) 60°C
 - D) 100°C

- 70) The modern accepted model of the cell membrane is:
- A) Unit membrane model
 - B) Sandwich model
 - C) Fluid mosaic model
 - D) Micellar model
- 71) Cellulose molecules are arranged in bundles called:
- A) Microtubules
 - B) Microfilaments
 - C) Microfibrils
 - D) Vesicles
- 72) Facilitated diffusion differs from simple diffusion because it
- A) Requires membrane proteins
 - B) Requires ATP
 - C) Occurs against gradient
 - D) Occurs only in animals
- 73) The enzyme responsible for breaking hydrogen peroxide into water and oxygen is
- A) Peroxidase
 - B) Catalase
 - C) Oxidase
 - D) Hydrolase
- 74) The secondary cell wall is usually deposited:
- A) Outside the primary wall
 - B) Between cells
 - C) Inside the cell membrane
 - D) Inside the primary wall
- 75) What is the primary functional difference between the Loop of Henle and the Vasa Recta in the renal medulla?
- A) Loop of Henle is a multiplier; Vasa Recta is an exchanger
 - B) Loop of Henle is an exchanger; Vasa Recta is a multiplier
 - C) Loop of Henle secretes urea; Vasa Recta reabsorbs glucose
 - D) Loop of Henle maintains gradients; Vasa Recta creates gradients
- 76) Homologous organs have:
- A) Same function but different origin
 - B) Different origin and different function
 - C) Same origin but different functions
 - D) Same origin and same function
- 77) An inhibitory postsynaptic potential (IPSP) hyperpolarizes the postsynaptic membrane. This is typically achieved by the opening of which channels?
- A) Chemically-gated Na^+ channels
 - B) Chemically-gated Cl^- or K^+ channels
 - C) Voltage-gated Ca^{2+} channels
 - D) Voltage-gated Na^+ channels
- 78) Which component of the Human Papillomavirus is used to create the VLP-based HPV vaccine?
- A) Viral DNA
 - B) Viral RNA
 - C) Major capsid protein L1
 - D) E6 and E7 oncoproteins
- 79) The term “vascular” refer to:
- A) Nerves
 - B) Blood vessels
 - C) Muscles
 - D) Bones
- 80) The cross-bridge is formed between:
- A) Actin and troponin
 - B) Myosin and ATP
 - C) Troponin and tropomyosin
 - D) Actin and myosin
- 81) You saw life cycle of Human Immunodeficiency virus (HIV) and you knew it contain an envelope which comes from:
- A) Cell membrane of liver cells
 - B) Cell membrane of skin cells
 - C) Cell membrane of lymphocytes
 - D) Cell membrane of spleen cells

CHEMISTRY

- 82) Which of the following gas samples contains the greatest number of moles?
 A) 22 g of CO_2 B) 4 g of H_2
 C) 17 g of NH_3 D) 18 g of H_2O
- 83) In an industrial synthesis, if 10 moles of N_2 react with 15 moles of H_2 to produce ammonia, which substance acts as the limiting reactant?
 A) N_2 B) H_2
 C) NH_3 D) Both are consumed completely
- 84) The electronegativity of carbon in ethyne will be
 A) 2.5 B) 2.66
 C) 3.0 D) 2.1
- 85) According to Pauli's Exclusion Principle, no two electrons in the same atom can have an identical set of:
 A) Three quantum numbers B) Four quantum numbers
 C) Principal and azimuthal quantum numbers D) Spins in different orbitals
- 86) The maximum number of electrons that can be accommodated in a subshell is given by the formula:
 A) $2n^2$ B) $2\ell + 1$
 C) $4\ell + 2$ D) $n - 1$
- 87) Which series of the hydrogen emission spectrum falls entirely within the visible region?
 A) Lyman series B) Balmer series
 C) Paschen series D) Brackett series
- 88) The shape of SO_2 molecule will be
 A) Trigonal Planar B) Bent
 C) Tetrahedral D) Trigonal Pyramidal
- 89) What is the accepted value and unit for the universal gas constant (R) when pressure is in atmospheres and volume is in liters?
 A) $8.314 \text{ J K}^{-1} \text{ mol}^{-1}$ B) $0.0821 \text{ atm L K}^{-1} \text{ mol}^{-1}$
 C) $1.987 \text{ cal K}^{-1} \text{ mol}^{-1}$ D) $62.4 \text{ torr L K}^{-1} \text{ mol}^{-1}$
- 90) Kinetic Molecular Theory assumes that the collisions between ideal gas molecules are:
 A) Inelastic B) Perfectly elastic
 C) Heat-generating D) Slow and irregular
- 91) The exceptionally high boiling point of water compared to hydrogen sulfide is primarily due to:
 A) High molecular mass B) London dispersion forces
 C) Hydrogen bonding D) Covalent bonding
- 92) The temperature at which the vapor pressure of a liquid becomes equal to the external atmospheric pressure is defined as its:
 A) Melting point B) Critical temperature
 C) Boiling point D) Dew point
- 93) Diamond is extremely hard because it is an example of a:
 A) Metallic solid B) Ionic solid
 C) Molecular solid D) Covalent network solid

- 94) The amount of energy released when one mole of an ionic crystalline solid is formed from its constituent gaseous ions is called:
- A) Hydration energy
B) Lattice energy
C) Ionization energy
D) Electron affinity
- 95) In the reversible reaction $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$, the addition of a catalyst will:
- A) Shift the equilibrium to the right
B) Decrease the activation energy for both forward and reverse reactions
C) Increase the yield of ammonia
D) Alter the equilibrium constant
- 96) A solution that resists changes in its pH upon the addition of small amounts of a strong acid or a strong base is known as a:
- A) Standard solution
B) Buffer solution
C) Saturated solution
D) Colloidal solution
- 97) As a general rule of thumb in reaction kinetics, the rate of a chemical reaction typically doubles for every:
- A) 1°C rise in temperature
B) 5°C rise in temperature
C) 10°C rise in temperature
D) 20°C rise in temperature
- 98) The sum of the exponents of the concentration terms in the experimentally determined rate law is called the:
- A) Molecularity of the reaction
B) Order of the reaction
C) Rate constant
D) Activation energy
- 99) Which of the following is a path function
- A) Temperature
B) Gibbs free energy
C) Pressure
D) Work
- 100) Hess's Law of constant heat summation is a direct application of the law of conservation of:
- A) Mass
B) Momentum
C) Energy
D) Matter
- 101) In any galvanic cell, the process of oxidation always occurs at the:
- A) Cathode
B) Anode
C) Salt bridge
D) Electrolyte solution
- 102) What is the oxidation state of manganese (Mn) in potassium permanganate (KMnO_4)?
- A) +3
B) +5
C) +7
D) +2
- 103) According to VSEPR theory, a central atom with sp^2 hybridization will exhibit which molecular geometry?
- A) Linear
B) Trigonal planar
C) Tetrahedral
D) Octahedral
- 104) Which of the following diatomic molecules contains a triple covalent bond?
- A) O_2
B) N_2
C) F_2
D) Cl_2
- 105) The anomalous behavior of lithium in Group I is primarily attributed to its:
- A) Large atomic radius
B) Small atomic size and high charge density
C) Exceptionally low ionization energy
D) High metallic character

- 106) Elements of Group IIA (Alkaline Earth Metals) typically exhibit an oxidation state of:
A) +1
B) +2
C) +3
D) -2
- 107) The transition metals frequently form brightly colored compounds due to:
A) s-p electron transitions
B) Large atomic radii
C) d-d electron transitions
D) High electronegativity
- 108) Organic compounds that possess the same molecular formula but contain different functional groups are known as:
A) Chain isomers
B) Position isomers
C) Functional group isomers
D) Metamers
- 109) Identify the correct IUPAC name for the structural formula $\text{CH}_3\text{--CH=CH--CH}_3$:
A) But-1-ene
B) But-2-ene
C) Butyne
D) Butadiene
- 110) The molecular shape of a benzene ring is:
A) Tetrahedral
B) Regular hexagonal planar
C) Trigonal bipyramidal
D) Octahedral
- 111) Alkynes can be synthesized in the laboratory by the dehydrohalogenation of:
A) Alkanes
B) Monohaloalkanes
C) Vicinal or geminal dihalides
D) Alcohols
- 112) Markovnikov's rule is specifically applied to the electrophilic addition reactions of:
A) Symmetrical alkenes
B) Unsymmetrical alkenes
C) Alkanes
D) Benzene rings
- 113) Which class of alkyl halides most readily undergoes nucleophilic substitution via the $\text{S}_\text{N}1$ mechanism?
A) Primary alkyl halides
B) Secondary alkyl halides
C) Tertiary alkyl halides
D) Methyl halides
- 114) Photochemical chlorination of an alkane initiated by
A) Pyrolysis
B) Homolysis
C) Peroxidation
D) Rearrangement
- 115) The mild oxidation of a primary alcohol initially produces:
A) A ketone
B) A carboxylic acid
C) An aldehyde
D) An ester
- 116) When phenol reacts with concentrated nitric acid, the major product formed is:
A) o-Nitrophenol
B) p-Nitrophenol
C) Picric acid (2,4,6-trinitrophenol)
D) Benzoic acid
- 117) Nucleophilic addition reactions are the characteristic chemical reactions of:
A) Alkanes
B) Alkenes
C) Carbonyl compounds (aldehydes and ketones)
D) Alkyl halides
- 118) Aldehydes can be distinguished from ketones because they reduce Tollens' reagent to produce a:
A) Red precipitate
B) Silver mirror
C) Blue solution
D) White precipitate

- 119) When acetic acid is heated with ethanol in the presence of an acid catalyst, the product formed is:
- A) Ethyl acetate
B) Dimethyl ether
C) Acetone
D) Acetaldehyde
- 120) Which of the following is a functional group derivative of carboxylic acids that contains a nitrogen atom?
- A) Ester
B) Acid halide
C) Amide
D) Acid anhydride
- 121) The specific linear sequence of amino acids in a polypeptide chain constitutes the protein's:
- A) Primary structure
B) Secondary structure
C) Tertiary structure
D) Quaternary structure
- 122) Enzymes, which act as biological catalysts in living organisms, are chemically composed of:
- A) Complex carbohydrates
B) Specialized lipids
C) Proteins
D) Nucleic acids
- 123) Nylon-6,6 is synthesized industrially and is classified as a:
- A) Addition polymer
B) Condensation polymer
C) Thermosetting plastic
D) Natural elastomer
- 124) In industrial chemistry, substances specifically formulated to bind two surfaces together are called:
- A) Dyes
B) Synthetic resins
C) Adhesives
D) Solvents
- 125) A dye that physically binds to a fabric through a direct chemical reaction with the fibers is called a:
- A) Direct dye
B) Reactive dye
C) Vat dye
D) Disperse dye
- 126) The correct solubility product (K_{sp}) expression for silver chloride (AgCl) in an aqueous solution is:
- A) $[\text{Ag}^+][\text{Cl}^-]$
B) $[\text{Ag}^+]^2[\text{Cl}^-]$
C) $[\text{Ag}^+][\text{Cl}^-]^2$
D) $[\text{AgCl}]$

PHYSICS

- 127) The cross product of two parallel or anti-parallel vectors always results in a:
 A) Unit vector
 B) Maximum magnitude vector
 C) Null (zero) vector
 D) Scalar value
- 128) If the rectangular components of a force are $F_x = 3 \text{ N}$ and $F_y = 4 \text{ N}$, the magnitude of the resultant force is:
 A) 1 N
 B) 5 N
 C) 7 N
 D) 12 N
- 129) A generator produces 500 pulses in 50 seconds. Its frequency is
 A) 10 sec^{-1}
 B) 0.1 sec^{-1}
 C) 500 sec^{-1}
 D) 50 sec^{-1}
- 130) During the entire flight of a projectile (ignoring air resistance), which quantity remains perfectly constant?
 A) Vertical velocity
 B) Horizontal velocity
 C) Kinetic energy
 D) Potential energy
- 131) The work done by a conservative force moving an object along a closed path is:
 A) Always positive
 B) Always negative
 C) Zero
 D) Equal to the frictional force
- 132) The gravitational potential energy of an object located at the surface of the Earth, when taken with reference to infinity, is:
 A) Positive
 B) Negative
 C) Zero
 D) Infinite
- 133) A body moving along a circular path with a uniform speed experience an acceleration that is directed:
 A) Along the tangent to the circle
 B) Outwards from the center
 C) Towards the center of the circle
 D) Zero, since speed is constant
- 134) Which of the pair of two projectiles projected at different angles have same ranges?
 A) $(30^\circ, 70^\circ)$
 B) $(40^\circ, 50^\circ)$
 C) $(35^\circ, 40^\circ)$
 D) $(45^\circ, 40^\circ)$
- 135) According to the equation of continuity for an ideal fluid, the velocity of fluid flow is:
 A) Directly proportional to the cross-sectional area
 B) Inversely proportional to the cross-sectional area
 C) Independent of the pipe's area
 D) Proportional to the fluid's pressure
- 136) The mathematical expression for the drag force acting on a spherical object falling through a viscous fluid is given by:
 A) Bernoulli's equation
 B) Torricelli's theorem
 C) Stokes' Law
 D) Pascal's principle
- 137) A motor boat is moving with velocity of 4 m/s . The net force acting on it is 4000 N . What will be power of engine of boat?
 A) 1000 W
 B) 160 W
 C) 16 KW
 D) 1600 W

- 138) In the formation of a stationary (standing) wave, the distance between two consecutive nodes is:
 A) λ B) $\lambda/2$
 C) $\lambda/4$ D) 2λ
- 139) The speed of sound in a gas is completely independent of changes in the gas's:
 A) Temperature B) Pressure (at constant density)
 C) Density D) Humidity
- 140) A body is moving with momentum of 100 kg m/s. What is the magnitude of force required to stop this body in 25 sec?
 A) 4 N B) 25 N
 C) 100 N D) 2500 N
- 141) The principle stating that heat cannot spontaneously flow from a colder body to a hotter body without external work is the:
 A) Zeroth Law of Thermodynamics B) First Law of Thermodynamics
 C) Second Law of Thermodynamics D) Third Law of Thermodynamics
- 142) The electric field intensity at any point inside a hollow, statically charged spherical conductor is:
 A) Maximum at the center B) Zero
 C) Uniform but non-zero D) Infinite
- 143) The speedometer of a car shows 36 km/hr. The angular speed of the wheels having 0.5m radius is
 A) 5 rad/sec B) 10 rad/sec
 C) 15 rad/sec D) 20 rad/sec
- 144) The rate at which electrical energy is dissipated as heat in a resistor is given by the formula:
 A) I^2Rt B) IRt
 C) I^2R D) V/R
- 145) A semiconductor material, whose electrical resistance decreases with a rise in temperature, is said to have a:
 A) Positive temperature coefficient B) Negative temperature coefficient
 C) Zero temperature coefficient D) Infinite resistance
- 146) A charged particle moving through a uniform magnetic field will experience zero magnetic force if the angle between its velocity and the field is:
 A) 90° B) 45°
 C) 0° or 180° D) 270°
- 147) When a charged particle enters a uniform magnetic field at exactly a right angle (90°) to the field lines, its path becomes:
 A) A straight line B) A parabola
 C) A circle D) An ellipse
- 148) The negative sign present in Faraday's law of electromagnetic induction indicates the direction of the induced emf and is a mathematical statement of:
 A) Ampere's Law B) Lenz's Law
 C) Gauss's Law D) Biot-Savart Law
- 149) The distance between adjacent node and anti-node is equal to
 A) λ B) $\lambda/2$
 C) 2λ D) $\lambda/4$

- 150) If the length of simple pendulum becomes four times, then its period will become
 A) Four times
 B) Half
 C) Two times
 D) One fourth
- 151) In alternating current circuits, the reciprocal of impedance is a quantity known as:
 A) Reactance
 B) Conductance
 C) Admittance
 D) Susceptance
- 152) Because it only allows significant current to flow in one direction, a p–n junction diode is primarily used as a:
 A) Signal amplifier
 B) Frequency oscillator
 C) Rectifier
 D) Variable resistor
- 153) The relation between radian and degree is
 A) $1 \text{ rad} = 57.3^\circ$
 B) $1^\circ = 57.3 \text{ rad}$
 C) $1 \text{ rad} = 1^\circ$
 D) $1^\circ = \pi \text{ rad}$
- 154) According to Max Planck's quantum theory, the energy (E) of a single photon with frequency (f) is calculated as:
 A) h/f
 B) hf
 C) hc/f
 D) f/h
- 155) The experimental phenomenon where high-frequency light strikes a metal surface and causes the ejection of electrons is called the:
 A) Compton effect
 B) Photoelectric effect
 C) Pair production
 D) X-ray emission
- 156) In Niels Bohr's model of the atom, the orbital angular momentum of an electron is quantized as an integral multiple of:
 A) h
 B) $h/2\pi$
 C) $2\pi/h$
 D) h/π
- 157) Which specific spectral series of the hydrogen atom falls entirely within the ultraviolet region of the electromagnetic spectrum?
 A) Lyman series
 B) Balmer series
 C) Paschen series
 D) Brackett series
- 158) Isotopes of a given chemical element are defined as atoms that possess the exact same number of:
 A) Neutrons in the nucleus
 B) Total nucleons
 C) Protons in the nucleus
 D) Positrons
- 159) The specific duration of time required for exactly half of the radioactive nuclei in a given sample to undergo decay is termed its:
 A) Mean life
 B) Decay constant
 C) Half-life
 D) Active life
- 160) In the study of nuclear physics and radioactivity, alpha particles are identified as being identical to:
 A) Fast-moving electrons
 B) Helium nuclei
 C) High-energy electromagnetic photons
 D) Isolated neutrons
- 161) If an object is thrown vertically upwards, what is the magnitude and direction of its acceleration at the very highest point of its trajectory?
 A) Zero
 B) 9.8 m/s^2 directed downwards
 C) 9.8 m/s^2 directed upwards
 D) Maximum acceleration upwards

- 162) According to the relationship between kinetic energy and momentum, if the momentum of a moving body is doubled, its kinetic energy becomes:
- A) Two times its original value B) Four times its original value
C) Half of its original value D) One-fourth of its original value

ENGLISH

- 163) Choose the correct option.
Many a candidate, along with his supporters, _____ eager to hear the result.
A) are B) is
C) were D) have been
- 164) The teacher said, "You need not bring your books tomorrow."
A) The teacher said that we needn't bring our books tomorrow
B) The teacher said that we had not needed to bring our books the following day
C) The teacher said that we did not need to bring our books the next day
D) The teacher said that we need not bring our books the next day
- 165) Someone must have stolen the documents.
A) The documents must be stolen. B) The documents had to be stolen.
C) The documents must have stolen. D) The documents must have been stolen.
- 166) Not only the students but also the principal _____ responsible for the delay.
A) are B) were
C) have been D) is
- 167) The officer said, "Let no one enter this room."
A) The officer told that no one would enter this room
B) The officer ordered that no one should enter that room
C) The officer ordered no one entered that room
D) The officer said that no one enters that room
- 168) One of the finest teachers who _____ contributed to our success is being honoured today.
A) has B) was
C) have D) is
- 169) People say that he is honest.
A) He says to be honest B) It has said that he is honest
C) He is said that he is honest D) It is said that he is honest
- 170) The number of applicants _____ increased significantly over the past five years.
A) have B) has
C) were D) are
- 171) He said to me, "May you succeed in your mission!"
A) He hoped me to succeed in my mission.
B) He said that I may succeed in my mission.
C) He prayed that I might succeed in my mission.
D) He wished that I might succeed in my mission

REASONING

- 172) Book : Library :: Artifact :
 A) Museum B) Factory
 C) School D) Laboratory
- 173) If TABLE is coded as UBCMF, then CHAIR will be coded as:
 A) DIBJS B) DIBJR
 C) DICJS D) EJBKS
- 174) A man said, "The woman standing there is the daughter of the only son of my grandfather."
 The woman is the man's:
 A) Sister B) Daughter
 C) Cousin D) Niece
- 175) Statement: All engineers are graduates. Some graduates are researchers.
 Conclusions:
 I. Some engineers are researchers. II. All engineers are graduates.
 A) Only I follows. B) Only II follows.
 C) Both I and II follow. D) Neither I nor II follows.
- 176) 2, 6, 12, 20, 30, ?
 A) 36 B) 40
 C) 42 D) 44
- 177) A man walks 8 km north, then turns right and walks 6 km. He then turns right and walks 8 km. How _____ far is he from his starting point?
 A) 6 km east B) 8 km south
 C) 14 km east D) 2 km west
- 178) Statements:
 All roses are flowers. Some flowers are red.
 Conclusions:
 I. Some roses are red. II. All roses are flowers.
 A) Only I follows. B) Only II follows.
 C) Both I and II follow. D) Neither I nor II follows.
- 179) The school has decided to ban the use of mobile phones during class hours.
 Assumptions:
 I. Mobile phones distract students during lessons. II. Every student owns a mobile phone.
 A) Only I follows B) Only II follows
 C) Both I and II follow D) Neither I nor II follows
- 180) Read the following statements:
 I. Heavy rainfall continued throughout the night.
 II. Several low-lying areas were flooded the next morning.
 A) Statement I is the cause, and Statement II is the effect
 B) Statement II is the cause, and Statement I is the effect
 C) Both statements are independent
 D) Both statements are effects of a common cause

ANSWER KEYS

MDCAT PAPER ON September, 6th 2026

ROOHANI TALABA JAMAT PAKISTAN SELF ASSESSMENT TEST

MCQS NO	Option	MCQS NO	Option	MCQS NO	Option	MCQS NO	Option	MCQS NO	Option	MCQS NO	Option
1	A	31	C	61	C	91	C	121	A	151	C
2	C	32	C	62	B	92	C	122	C	152	C
3	C	33	C	63	Correct	93	D	123	B	153	A
4	B	34	C	64	B	94	B	124	C	154	B
5	B	35	A	65	C	95	B	125	B	155	B
6	C	36	B	66	C	96	B	126	A	156	B
7	D	37	A	67	B	97	C	127	C	157	A
8	B	38	A	68	B	98	B	128	B	158	C
9	A	39	C	69	B	99	D	129	A	159	C
10	C	40	C	70	C	100	C	130	B	160	B
11	C	41	D	71	C	101	B	131	C	161	B
12	B	42	C	72	A	102	C	132	B	162	B
13	C	43	C	73	B	103	B	133	C	163	B
14	B	44	C	74	D	104	B	134	B	164	D
15	B	45	B	75	A	105	B	135	B	165	D
16	C	46	D	76	C	106	B	136	C	166	D
17	A	47	D	77	B	107	C	137	C	167	B
18	B	48	A	78	C	108	C	138	B	168	C
19	B	49	B	79	B	109	B	139	B	169	D
20	C	50	B	80	D	110	B	140	A	170	B
21	D	51	B	81	C	111	C	141	C	171	C
22	A	52	D	82	B	112	B	142	B	172	A
23	A	53	A	83	B	113	C	143	D	173	A
24	B	54	D	84	B	114	B	144	C	174	A
25	D	55	A	85	B	115	C	145	B	175	B
26	B	56	B	86	C	116	C	146	C	176	C
27	B	57	D	87	B	117	C	147	C	177	A
28	A	58	A	88	B	118	B	148	B	178	B
29	A	59	B	89	B	119	A	149	D	179	A
30	C	60	D	90	B	120	C	150	C	180	A