

MDCAT Paper

(Biology Section)

1. **According to Lamarck, evolution occurred as the result of:**
 - (a) Natural selection
 - (b) The theory of recapitulation
 - (c) Over reproduction
 - (d) Acquired character
2. **Darwin's theory was based on all of the following points except:**
 - (a) Over reproduction
 - (b) Struggle for existence
 - (c) Variations and heredity
 - (d) Survival of the fittest
 - (e) Use and disuse of organs
3. **Which of the following negates Lamarck's theory?**
 - (a) Elongated fore-limb's and neck of giraffe
 - (b) Custom of circumcision
 - (c) Evolution of snake
 - (d) Foot of modern horse
 - (e) Webbed feet of duck
4. **In the Hardy-Weinberg principle, $p^2 + 2pq + q^2 = 1$, q^2 represents the frequency of the:**
 - (a) Homozygous dominant
 - (b) Heterozygous dominant
 - (c) Heterozygous recessive
 - (d) Homozygous recessive
 - (e) Blended genes
5. **Which one of the terms below correctly describes the relationship between the skeletal system in the wing of bird, fore-limb of turtle, fore-leg of horse, and arm of man?**
 - (a) Analogous
 - (b) Homologous
 - (c) Homozygous
 - (d) Monotypic
 - (e) Taxonomic

6. **If Prince is haemophilic and his princess is a carrier, calculate the chances of their son being haemophilic.**
- (a) $\frac{1}{4}$
 - (b) $\frac{1}{2}$
 - (c) $\frac{2}{4}$
 - (d) $\frac{1}{3}$
7. **Law of independent assortment can be explained by:**
- (a) Monohybrid cross and monohybrid ratio
 - (b) Dihybrid cross and dihybrid ratio
 - (c) Trihybrid cross and trihybrid ratio
 - (d) All of the above
8. **Which of the following is an example of a pivot joint?**
- (a) Knee joint
 - (b) Shoulder joint
 - (c) Elbow joint
 - (d) Atlas-axis joint
9. **The basic unit of contraction is the:**
- (a) Myosin
 - (b) Actin
 - (c) Z-Lines
 - (d) Sarcomere
10. **During contraction, which one disappears?**
- (a) H band
 - (b) A band
 - (c) I band
 - (d) H Zone
11. **The control center of reflex action is:**
- (a) Cerebellum
 - (b) Cerebrum
 - (c) Spinal cord
 - (d) Medulla oblongata
12. **Motor neuron leaves from the _____ surface of the spinal cord and forms the _____ root.**
- (a) Dorsal, Ventral
 - (b) Ventral, Dorsal
 - (c) Dorsal, Dorsal
 - (d) Ventral, Ventral

13. **During translation, which of the following is true?**
- (a) tRNA binds with the larger unit of ribosomes
 - (b) The first tRNA binds at the P site
 - (c) The output of translation is proteins
 - (d) All
14. **Which of the following is not the function of the parasympathetic nervous system?**
- (a) Contract pupil
 - (b) Stimulates saliva production
 - (c) Constrict bronchi
 - (d) Inhibits urination
15. **Which nervous system is often called "rest and rumination"?**
- (a) Parasympathetic Nervous system
 - (b) Sympathetic Nervous system
 - (c) Centralized Nervous system
 - (d) Spinal Nervous system
16. **The theory that says Mitochondria and chloroplast are ancient bacteria that now live inside larger cells is called:**
- (a) Darwin's theory
 - (b) Neo-Darwinism
 - (c) Lamarckism
 - (d) Endosymbiotic theory
17. **What is the function of HIV's gp120 protein?**
- (a) Capsid assembly
 - (b) Binding to CD4 receptors
 - (c) Genome replication
 - (d) Viral exit
18. **The light band of the sarcomere is called:**
- (a) H band
 - (b) A band
 - (c) I band
 - (d) M band
19. **The infection of urinary bladder is known as:**
- (a) Urethritis
 - (b) Cystitis
 - (c) Pyelonephritis
 - (d) Glomerulonephritis

20. **Which of the following is not a mode of transmission of AIDS?**
- (a) Through unsterilized needles
 - (b) Through contact with open wounds
 - (c) Through blood transfusion
 - (d) Through holding hands
21. **The structure formed when the cell reaches its maximum size:**
- (a) Primary Cell wall
 - (b) Secondary Wall
 - (c) Middle Lamellae
 - (d) All
22. **The Cristae in mitochondria is composed of:**
- (a) Phospholipid
 - (b) Lipoprotein
 - (c) Glycoprotein
 - (d) Nucleoprotein
23. **The small oval bodies which act as filtering structures are:**
- (a) Afferent lymph vessel
 - (b) Lymph Node
 - (c) Efferent lymph vessel
 - (d) Lymphatic trunk
24. **Which of the following takes part in the formation of the cranium?**
- (a) Frontal bone
 - (b) Occipital bone
 - (c) Sphenoid
 - (d) Ethmoid
 - (e) All
25. **Vital capacity of lungs is:**
- (a) $TV + IRV + ERV$
 - (b) $TV + IRV + RV$
 - (c) $TV + ERV$
 - (d) $IRV + ERV$
26. **How are viruses taxonomically categorized?**
- (a) Solely by host specificity
 - (b) Through analysis of strand multiplicity and pathological manifestations
 - (c) Exclusively by disease severity
 - (d) Based on cellular reproduction rates

27. **What pathological syndrome is predominantly associated with HIV's immunosuppressive effects?**
- (a) Enhanced immune proliferation
 - (b) Acquired Immunodeficiency Syndrome (AIDS)
 - (c) Accelerated cellular regeneration
 - (d) Reduced viral latency
28. **Which transmission vector is most critically linked to HIV dissemination?**
- (a) Airborne particulate matter
 - (b) Bloodborne or bodily fluid exchange
 - (c) Direct cutaneous contact
 - (d) Environmental contamination
29. **What structural feature enables viruses to evade host immunological surveillance?**
- (a) Rigid capsid stability
 - (b) Rapid antigenic variability
 - (c) Enhanced enzymatic activity
 - (d) Increased genomic fidelity
30. **How does cellular respiration adapt the oxidation of proteins and fats relative to glucose?**
- (a) Enhances glycolytic efficiency
 - (b) Correlates metabolic pathways with glucose catabolism
 - (c) Reduces mitochondrial activity
 - (d) Increases anaerobic yield
31. **What mitochondrial process predominantly generates ATP during aerobic respiration?**
- (a) Glycolytic phosphorylation
 - (b) Electron transport chain coupling
 - (c) Krebs cycle intermediates
 - (d) Fermentative conversion
32. **Which metabolic substrate yields the highest ATP output per molecule?**
- (a) Monosaccharide sugars
 - (b) Polypeptide protein chains
 - (c) Triglyceride lipid reserves
 - (d) Nucleic acid derivatives
33. **How does oxygen serve as a critical component in bioenergetic pathways?**
- (a) Catalyzes substrate phosphorylation
 - (b) Acts as the terminal electron acceptor

- (c) Inhibits proton gradient formation
- (d) Enhances carbon fixation

34. How are biological macromolecules systematically classified within cellular systems?

- (a) Based on atomic weight
- (b) Through structural and functional categorization
- (c) According to thermal stability
- (d) By enzymatic degradation rates

35. What physicochemical property underscores water's biological significance?

- (a) Non-polar molecular structure
- (b) Polarity and solvent capabilities
- (c) High ionic conductivity
- (d) Reduced specific heat

36. Which carbohydrate class includes disaccharide sucrose as a representative?

- (a) Monosaccharide units
- (b) Oligosaccharide linkages
- (c) Polysaccharide polymers
- (d) Glycogen reserves

37. What structural motif defines the polypeptide architecture of proteins?

- (a) Carbohydrate cross-links
- (b) Amino acid sequential chains
- (c) Lipid bilayer formations
- (d) Nucleic acid hybrids

38. What distinguishes prokaryotic from eukaryotic cellular organization?

- (a) Presence of membrane-bound organelles in prokaryotes
- (b) Nuclear membrane absence in prokaryotes
- (c) Identical chromosomal structures
- (d) Uniform ribosomal subunits

39. Which organelle serves as the primary site for protein modification?

- (a) Mitochondrial matrix
- (b) Golgi apparatus processing unit
- (c) Endoplasmic reticulum network
- (d) Lysosomal degradation zone

40. How do cytoplasmic organelles contribute to cellular homeostasis?

- (a) Enhance extracellular signaling
- (b) Perform specialized metabolic functions
- (c) Reduce membrane permeability
- (d) Increase genetic mutation rates

41. **What physiological role do sensory receptors fulfill in neural signaling?**
- (a) Generate action potentials directly
 - (b) Transduce environmental stimuli into neural signals
 - (c) Regulate blood flow
 - (d) Synthesize neurotransmitters
42. **Which neuronal component facilitates impulse propagation along the axon?**
- (a) Dendritic branching
 - (b) Myelin sheath insulation
 - (c) Cell body nucleus
 - (d) Axonal terminal vesicles
43. **What defines the electrophysiological nature of a nerve impulse?**
- (a) Passive diffusion of ions
 - (b) Rapid depolarization and repolarization wave
 - (c) Slow enzymatic reaction
 - (d) Continuous membrane leakage
44. **How do enzymes facilitate biochemical reactions at the molecular level?**
- (a) Alter substrate solubility
 - (b) Lower activation energy via active site interaction
 - (c) Increase reaction entropy
 - (d) Enhance product degradation
45. **What role do enzyme inhibitors play in metabolic regulation?**
- (a) Enhance catalytic efficiency
 - (b) Interfere with active site or allosteric binding
 - (c) Increase substrate affinity
 - (d) Stabilize enzyme conformation
46. **Which part of the hindbrain is responsible for regulating breathing patterns?**
- (1) Medulla oblongata
 - (2) Cerebellum
 - (3) Brain stem
 - (4) Pons
47. **When a neuron's membrane potential is between -70 mV and -90 mV, it is said to be in a state of:**
- (1) Depolarization
 - (2) Hyperpolarization
 - (3) Repolarization
 - (4) No polarization

48. **Addison's disease occurs because of the under-secretion of which hormone?**
- (1) Antidiuretic hormone
 - (2) Aldosterone
 - (3) Corticosterone
 - (4) Melanocyte-stimulating hormone
49. **Human immunodeficiency virus attacks which of the following cells for its multiplication?**
- (1) Neutrophils
 - (2) Macrophages
 - (3) Cytotoxic T cells
 - (4) Helper T cells
50. **Carbon dioxide enters the leaf through:**
- (1) Chloroplasts
 - (2) Mesophyll
 - (3) Thylakoids
 - (4) Stomata
51. **Which of the following is respiratory fuel?**
- (1) Sucrose
 - (2) Glucose
 - (3) Galactose
 - (4) Mannose
52. **Lysosomes originate from which cell organelle?**
- (1) Rough endoplasmic reticulum
 - (2) Smooth endoplasmic reticulum
 - (3) Golgi apparatus
 - (4) Cell membrane
53. **Neurilemma cells are also known as?**
- (1) Photoreceptors
 - (2) Odontoblasts
 - (3) Ganglion
 - (4) Schwann cells
54. **An activated enzyme consisting of a polypeptide chain and a cofactor is called?**
- (1) Apoenzyme
 - (2) Holoenzyme
 - (3) Conjugated enzyme
 - (4) Hybrid enzyme

55. The humerus makes a ball and socket joint with:

- (1) Clavicle
- (2) Sternum
- (3) Innominate
- (4) Scapula

56. A chemical which is applied on nonliving surfaces in order to control bacteria is called:

- (1) Disinfectants
- (2) Antiseptic
- (3) Vaccines
- (4) Antibiotics

57. Iliac vein from the lower limb unites to form:

- (1) Vena cava
- (2) Renal vein
- (3) Hepatic portal vein
- (4) Cardiac vein

58. A bacterial cell envelope does not include:

- (1) Slime
- (2) Capsule
- (3) Cell wall
- (4) Cell membrane

59. Rugae are:

- (1) Gastric folds
- (2) Intestinal folds
- (3) Colonic folds
- (4) Oesophageal folds

60. During a muscular contraction, which of the following elements maintains constant length?

- (1) I band
- (2) H zone
- (3) A band
- (4) Sarcomere

61. Glycolysis takes place in:

- (1) Nucleus
- (2) Cytosol
- (3) Mitochondria
- (4) Ribosomes

62. **What is the interaction between genes occupying different loci known as?**
- (1) Dominance
 - (2) Pleiotropy
 - (3) Epistasis
 - (4) None of these
63. **The largest lymphoid tissue of the body is:**
- (1) Spleen
 - (2) Liver
 - (3) Bone marrow
 - (4) Tonsils
64. **Which of the following is common feature of all cells?**
- (1) Intracellular organelles
 - (2) A lipid cell membrane
 - (3) Nuclear membrane
 - (4) RNA genome
65. **Antagonistic organelles of the cell?**
- (1) Nucleus and RER
 - (2) RER and SER
 - (3) Mitochondria and Chloroplast
 - (4) RER and Golgi bodies
66. **Which of the following is NOT innervated by the autonomic nervous system?**
- (1) Branching muscle cell
 - (2) Intestinal muscle cell
 - (3) Striated skeletal muscle cell
 - (4) Myocardial cell
67. **Which of the following structures in the plant cell is responsible for photosynthesis?**
- (1) Mitochondria
 - (2) Chloroplast
 - (3) Nucleus
 - (4) Ribosomes
68. **Which of the following is a characteristic feature of prokaryotic cells?**
- (1) Presence of a true nucleus
 - (2) Presence of mitochondria
 - (3) Absence of membrane-bound organelles
 - (4) Presence of Golgi apparatus

69. The primary structure of a protein refers to:

- (1) Its three-dimensional shape
- (2) The sequence of amino acids in the polypeptide chain
- (3) Its subunit organization
- (4) The folding pattern of the protein

70. Which part of the human brain is responsible for controlling balance and coordination?

- (1) Cerebrum
- (2) Medulla Oblongata
- (3) Cerebellum
- (4) Thalamus

71. Viruses use which of the following enzyme for the breakdown of the bacterial cell wall?

- (1) Lysozyme
- (2) Lipase
- (3) Protease
- (4) Nuclease

72. What type of virus is the poliovirus?

- (1) DNA enveloped virus
- (2) RNA enveloped virus
- (3) DNA naked virus
- (4) RNA naked virus

73. It refers to the final changes within an immature virion that result in an infectious virus particle:

- (1) Assembly
- (2) Coating
- (3) Integration
- (4) Maturation

74. The replication of the HIV nucleic acid depends on:

- (1) Protease
- (2) Reverse transcriptase
- (3) Transcriptase
- (4) Integrase

75. Which of the following is NOT a property of the mucous lining of the respiratory tract?

- (1) Warms incoming air
- (2) Contains microvilli

- (3) Contains cilia
- (4) Cleanses particles

76. Which of the following is the most abundant type of cartilage in the human body?

- (1) Hyaline cartilage
- (2) Elastic cartilage
- (3) Fibrocartilage
- (4) Calcified cartilage

77. Which of the following is NOT innervated by the autonomic nervous system?

- (1) Branching muscle cell
- (2) Intestinal muscle cell
- (3) Striated skeletal muscle cell
- (4) Myocardial cell

78. Which of the following is the primary function of ATP?

- (1) Act as a catalyst
- (2) Act as a primary messenger
- (3) Energy source
- (4) To store energy

79. The primary spermatocytes undergo meiotic division to form:

- (1) Spermatozoa
- (2) Secondary spermatocyte
- (3) Primary oocyte
- (4) Mature sperms

80. Which of the following movements are possible due to pivot joints?

- (1) Flexion
- (2) Adduction
- (3) Rotation
- (4) Extension

81. What is the interaction between genes occupying different loci known as?

- (1) Dominance
- (2) Pleiotropy
- (3) Epistasis
- (4) None of these

(Chemistry Section)

82. Which of the following is used as a conversion factor in stoichiometric calculations?

- A) Density
- B) Mole ratio
- C) Atomic radius
- D) Empirical formula

83. Which of the following orbitals is spherical in shape?

- A) s-orbital
- B) p-orbital
- C) d-orbital
- D) f-orbital

84. The spectral lines in hydrogen atom are explained by:

- A) Rutherford's theory
- B) Bohr's model
- C) Dalton's theory
- D) Quantum mechanical model

85. According to Kinetic Molecular Theory, gases move:

- A) Slowly and steadily
- B) Randomly and constantly
- C) In circular motion
- D) In fixed paths

86. A saturated solution of a sparingly soluble salt is in equilibrium with:

- A) Gas
- B) Ions in solution
- C) Water
- D) Catalyst

87. Vapor pressure of a liquid increases with:

- A) Decrease in temperature
- B) Increase in temperature
- C) Decrease in volume
- D) Increase in atmospheric pressure

88. Which of the following is the correct form of the ideal gas equation?

- A) $PV = nRT$
- B) $P + V = nRT$
- C) $PV/T = nR$
- D) $P = RT/V$

89. According to Boyle's Law, if pressure increases, the volume of gas:

- A) Increases
- B) Remains constant
- C) Decreases
- D) Becomes zero

90. What is the standard electrode potential of the Standard Hydrogen Electrode (SHE)?

- A) 1.0 V
- B) 0.5 V
- C) 0.0 V
- D) -1.0 V

91. The cathode is:

- A) Always positive
- B) Always negative
- C) Where oxidation occurs
- D) Where reduction occurs

92. What happens during dehydration of alcohol?

- A) Addition of water
- B) Removal of H₂
- C) Removal of H₂O
- D) Oxidation

93. Transition metals show variable oxidation states because:

- A) They are radioactive
- B) They have filled d-orbitals
- C) They have unpaired d-electrons
- D) They are noble gases

94. The functional group of aldehyde is:

- A) -COOH
- B) -OH
- C) -CHO
- D) -CO

95. A reaction at equilibrium is characterized by:

- A) Only forward reaction occurring
- B) Only reverse reaction occurring
- C) Forward and reverse reactions occurring at the same rate
- D) Reactions stopping completely

96. According to Le Chatelier's Principle, increasing temperature favors:

- A) Exothermic reaction
- B) Endothermic reaction
- C) Both
- D) Neither

97. Enthalpy is defined as:

- A) Internal energy + work
- B) Heat content at constant pressure
- C) Energy per mole
- D) Product of pressure and temperature

98. What is the first step in the free radical mechanism?

- A) Initiation
- B) Propagation
- C) Termination
- D) Ionization

99. According to Hess's Law:

- A) Enthalpy change depends on the path
- B) Energy cannot be destroyed
- C) Heat change is the same regardless of the path
- D) Energy is released in endothermic reactions

100. Absolute zero is the temperature at which:

- A) Gas volume becomes infinite
- B) Molecular motion stops
- C) Pressure is highest
- D) Gas changes into liquid

101. Which of the following is a crystalline solid?

- A) Glass
- B) Rubber
- C) Quartz
- D) Plastic

102. For the reaction $2A + 3B \rightarrow C$, if 6 moles of A and 12 moles of B are mixed, how many moles of C are formed, assuming complete reaction?

- A) 2 moles
- B) 3 moles
- C) 4 moles
- D) 6 moles

103. In the reaction $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$, 14 g of N_2 reacts with 8 g of H_2 . What is the maximum mass of NH_3 produced?

- A) 8.5 g
- B) 17 g
- C) 34 g
- D) 12 g

104. What is the electron configuration of Cu^+ (atomic number 29)?

- A) $[\text{Ar}] 4s^1 3d^9$
- B) $[\text{Ar}] 3d^{10}$
- C) $[\text{Ar}] 4s^2 3d^8$
- D) $[\text{Ar}] 4s^1 3d^{10}$

105. Which of the following quantum numbers is invalid for an electron in a 4p orbital?

- A) $n=4, l=1, m_l=0, m_s=+1/2$
- B) $n=4, l=2, m_l=-1, m_s=-1/2$
- C) $n=4, l=1, m_l=+1, m_s=+1/2$
- D) $n=4, l=1, m_l=0, m_s=-1/2$

106. What is the wavelength of light emitted when an electron in a hydrogen atom transitions from $n=4$ to $n=2$?

- A) 656 nm
- B) 486 nm
- C) 410 nm
- D) 364 nm

107. A gas at 2 atm and 5 L is compressed to 1 L. What is the final pressure at constant temperature?

- A) 8 atm
- B) 10 atm
- C) 12 atm
- D) 6 atm

108. Which of the following is a crystalline solid?

- A) Glass
- B) Rubber
- C) Quartz
- D) Plastic

109. Which compound has the highest boiling point due to hydrogen bonding?

- A) CH_3NH_2
- B) H_2O

- C) CH_3F
- D) HF

110. For $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g})$, $\Delta H = -198 \text{ kJ/mol}$, what happens if pressure is increased?

- A) Shifts to reactants
- B) Shifts to products
- C) No shift
- D) Temperature increases

111. What is the major product of $\text{CH}_3\text{CH}=\text{CH}_2$ with HBr in the presence of peroxides?

- A) $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$
- B) $\text{CH}_3\text{CHBrCH}_3$
- C) $\text{CH}_2\text{BrCH}_2\text{CH}_3$
- D) $\text{CH}_3\text{CH}_2\text{Br}$

112. The distillation which is carried out under reduced pressure is called as:

- A) Pressure distillation
- B) Reduced distillation
- C) Vacuum distillation
- D) Low boiling distillation

113. HF has higher boiling point than HCl due to:

- A) Dipole-dipole force
- B) Dipole induced dipole forces
- C) London dispersion force
- D) Hydrogen bonding

114. Which of the following compounds has the highest boiling point due to hydrogen bonding?

- A) CH_3NH_2
- B) H_2O
- C) CH_3F
- D) HF

115. Lattice energy decrease when:

- A) Charge to size ratio increases
- B) Charge to size ratio decreases
- C) Charge increases
- D) Size decreases

116. The shape of H_2S is:

- A) Angular
- B) Tetrahedral

- C) Octahedral
- D) Trigonal planar

117. Ionization energies of atoms depend upon the factors:

- A) Atomic radius of atoms
- B) Nature of orbital
- C) Shielding effect of inner electrons
- D) All of these

118. Which of the following shows optical isomerism?

- A) $\text{CH}_3\text{CH}_2\text{OH}$
- B) $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$
- C) $\text{CH}_3\text{CH}_2\text{CH}_3$
- D) CH_3COCH_3

119. In aldol condensation, carbanion acts as:

- A) Acid
- B) Base
- C) Nucleophile
- D) Electrophilic

120. Which of the following does not react with bases?

- A) Carboxylic acids
- B) Phenol
- C) Ethanol
- D) HCl

121. Which enzyme is raised in rickets?

- A) Alkaline phosphatase
- B) LDH-1
- C) Acidic phosphatase
- D) None

122. The type and relative abundance of isotopes in an element can be determined by:

- A) Infrared spectroscopy
- B) Ultraviolet spectroscopy
- C) Mass spectrometry
- D) Nuclear magnetic resonance spectroscopy

123. The atomic mass of an element depends upon:

- A) The atomic number of the element
- B) The number of electrons in the element
- C) The number of isotopes of the element and their relative abundances
- D) None of the above

124. Which of the following compounds does NOT have a tendency to form hydrogen bonding?

- A) Ammonia
- B) Ethyl alcohol
- C) Carboxylic acid
- D) Hydrocarbon

125. The boiling point of a liquid is the temperature at which:

- A) Surface tension is greater than the atmospheric pressure
- B) Viscosity is less than the atmospheric pressure
- C) Vapor pressure equals the atmospheric pressure
- D) Viscosity equals the atmospheric pressure

126. The oxidation number of 'Mn' in KMnO_4 is:

- A) 0
- B) +1
- C) -7
- D) +7

(Physics Section)

127. In case of motion of paratrooper, when weight of paratrooper and air resistance become equal then paratrooper falls with:

- A) Variable acceleration
- B) Zero acceleration
- C) Uniform acceleration
- D) Gravitational acceleration

128. Which of the following has no acceleration?

- A) Man driving a car on busy road
- B) Rock rolling down a mountain
- C) A luggage in flying airplane
- D) A bike moving on a rough road

129. When collision between the bodies in a system is inelastic in nature then for system?

- A) Momentum changes but K.E remain conserve
- B) K.E changes but momentum remain conserve
- C) Both momentum and K.E change
- D) Both momentum and K.E remain conserve

130. A man pulling a bag with force of 20 N at an angle 60° with horizontal plane. If bag covers a distance of 15 m, then work done by the man is:

- A) 50 J
- B) 75 J
- C) 150 J
- D) 100 J

131. The acceleration of a body traveling with uniform speed in a circle is:

- A) Zero
- B) Directed towards center of circle
- C) Directed away from center of circle
- D) Directed along tangent line

132. The power required to raise a block of mass 500 kg vertical to height 15 m in a time of 50s is:

- A) 1 hp
- B) 2 hp
- C) 3 hp
- D) 4 hp

133. According to Faraday's law of electromagnetic induction:

- A) The direction of induced current is such that it opposes the cause producing it
- B) The magnitude of induced emf produced in a coil is directly proportional to the rate of change of magnetic flux
- C) The direction of induced emf is such that it opposes the cause producing it
- D) None of these

134. The energy stored in a parallel plate capacitor is 24 J. What is the potential difference between the plates if the capacitance of the capacitor is 3F?

- A) 4kV
- B) 8 kV
- C) 16kV
- D) 64 kV

135. The half-time of a radioactive sample (in minutes), if its mean life is 200s is:

- A) 0.69 min
- B) 2 min
- C) 2.57 min
- D) 2.31 min

136. A coil having an area 5 m^2 placed in a magnetic field which changes from 1 Wb/m^2 to 4 Wb/m^2 in an interval of 3 seconds. The emf induced in the coil will be:

- A) 15 V
- B) 10 V
- C) 1 V
- D) 5 V

137. What is the measure in radians of the angle $A = 330^\circ$?

- A) $5\pi/6$
- B) $11\pi/6$
- C) $\pi/6$
- D) $7\pi/6$

138. A stationary wave is formed in a pipe which is open at one end. If two complete loops are formed and the wavelength of the wave is 10 cm, what is the length of the pipe?

- A) 10 cm
- B) 15 cm
- C) 12.5 cm
- D) 7.5 cm

139. 100 W heater is used for 5 minutes to heat 500 g of water. What is the change in temperature of water? Specific heat capacity of water is $4.2 \text{ J/g}^\circ\text{C}$.

- A) 140°C
- B) 40°C
- C) 0.2°C
- D) 14°C

140. The force between two charges Q and q , separated by a distance d is F . What will be the force between them when distance between them is $d/2$?

- A) $4F$
- B) $2F$
- C) F
- D) $F/2$

141. Time constant is defined as the time required by the capacitor:

- A) To deposit 63% of the equilibrium charge
- B) To deposit 36% of the equilibrium charge
- C) To deposit 63 times of the equilibrium charge
- D) To deposit 36 times of the equilibrium charge

- B) 2.5 T
- C) 0.5 T
- D) 2 T

143. Radon-222 has 136 neutrons, how many neutrons are there in Radon-220?

- A) 131
- B) 134
- C) 136
- D) none of these

144. The length of a string is 1m, tension in it is 40N, and mass of the string is 0.1 kg. Then the velocity of transverse waves produced in the string will be:

- A) 400 m/s
- B) 80 m/s
- C) 180 m/s
- D) 20 m/s

145. What should be the length of a closed pipe to produce resonance with sound waves of wavelength 62 cm?

- A) 31 cm
- B) 15.5 cm
- C) 45 cm
- D) 20.5 cm

146. A stretched wire of length 1 m and weighing 1 gram is in unison with a tuning fork of frequency 200 Hz. The tension in the wire will be:

- A) 160 N
- B) 80 N
- C) 320 N
- D) 200 N

147. A body is projected with kinetic energy E so as to attain maximum horizontal range. Its potential energy at the highest point is:

- A) $2E$
- B) $E/2$
- C) $4E$
- D) E

148. The work done by gravity during the descent of a projectile:

- A) Is negative
- B) Depends for its sign on the direction of the y axis
- C) Zero
- D) Is positive

149. The concept of the lines of force in the study of electric field was introduced by:

- A) Edison
- B) Faraday
- C) Kirchhoff
- D) Fleming

150. A particle of mass m and charge Q moving with velocity V enters the region of a uniform magnetic field at right angle to the direction of its motion. How does its kinetic energy get affected?

- A) Its kinetic energy will be affected
- B) Its kinetic energy will not be affected
- C) Its kinetic force
- D) None of the above

151. What is the half-life of Iodine I-125?

- A) 2 weeks
- B) 8 weeks
- C) 7 weeks
- D) 10 weeks

152. A car travels 30 m toward east, then it takes turn and travels 40 m towards north. It takes 50 seconds. Its average velocity is:

- A) $7/5$ m/s
- B) 1 m/s
- C) $1/5$ m/s
- D) 5 m/s

153. Which physical quantity is a vector?

- A) Speed
- B) Distance
- C) Displacement
- D) Work

154. Which of the following has the same unit as energy?

- A) Power
- B) Force
- C) Work
- D) Pressure

155. The SI unit of electric charge is:

- A) Coulomb
- B) Ampere

- C) Volt
- D) Ohm

156. Acceleration is defined as:

- A) Rate of change of speed
- B) Rate of change of distance
- C) Rate of change of velocity
- D) None of these

157. Ohm's Law is represented as:

- A) $V = IR$
- B) $P = IV$
- C) $V = IQ$
- D) $I = VR$

158. A body is in equilibrium when net force is:

- A) Zero
- B) One
- C) Two
- D) Infinite

159. Work done is maximum when the angle between force and displacement is:

- A) 30°
- B) 45°
- C) 60°
- D) 0°

160. The unit of electric field is:

- A) N/C
- B) V
- C) A
- D) C

161. Magnetic field is produced by:

- A) Static charges
- B) Moving charges
- C) Insulators
- D) Conductors only

162. The time taken for one complete wave to pass is called:

- A) Frequency
- B) Wavelength
- C) Time period
- D) Speed

(English Section)

163. Fill in the blank: The boys ran through the sprinkler and then the mud.

- A) at
- B) in
- C) onto
- D) into

164. Fill in the blank: They will be treated ____ any other applicant.

- A) as
- B) like
- C) that
- D) of

165. Fill in the blank: Where are they travelling ____ this summer?

- A) to
- B) from
- C) No preposition
- D) in

166. Fill in the blank: Charles talks ____ his brother does.

- A) the way
- B) like
- C) that
- D) of

167. Fill in the blank: Did you take an envelope ____ my desk?

- A) to
- B) on
- C) of
- D) off

168. Find the error: She reacted swift, which made him feel bad about insulting her.

- A) swift
- B) feel
- C) bad
- D) insulting

169. Find the error: Under circumstances, if he lays, he will only compound the case against him.

- A) Under
- B) lays

- C) only
- D) against

170. Find the error: Nervousness, not to mention lack of sleep, contribute to poor performance.

- A) not to mention
- B) lack of sleep
- C) contribute
- D) to poor performance

171. Choose the correct option: Of your three dogs, which is the cutest?

- A) Of your three dogs, which is cutest?
- B) Of your three dogs, which the cuter?
- C) Of your two dogs, which is the more cuter?
- D) Of your three dogs, which is the cutest?

(Analytical Reasoning)

172. Man: Biography :: Nation :?

- A) History
- B) Geography
- C) People
- D) Leader

173. Statements:

All soaps are clean.

All clean are wet.

Conclusions:

I. Some clean are soaps.

II. No clean is soap

III. Some wet are soaps.

IV. All wet are soaps.

- A) Only I follows
- B) Only II and IV follows
- C) Only I and III follows
- D) None follows

174. Statements:

Alert villagers nabbed a group of bandits armed with murderous weapons.

Courses of action:

I. The villagers should be provided sophisticated weapons.

II. The villagers should be rewarded for their courage and unity.

- A) If only I follows

- B) If only II follows
- C) If either I or II follows
- D) If neither I nor II follows

175. Three of the words will be in the same classification, the remaining one will not be. Your answer will be the one word that does NOT belong in the same classification as the others.

- A) Tulip
- B) Rose
- C) Bud
- D) Daisy

176. The student discussed mainly industrial relations problems.

- A) Definitely true
- B) Probably true
- C) Data inadequate
- D) Probably false
- E) Definitely false

177. Statements:

- I. The price of aircraft fuel has risen during the past few months.
- II. Many Passenger airlines in Pakistan have been forced to cut their air fares by about 10%
- A) Statement I is the cause and statement II is its effect.
- B) Statement II is the cause and statement I is its effect.
- C) Both statement I and II are independent causes.
- D) Both statement I and II are effects of independent causes.

178. Which number comes next in the series?

2, 6, 12, 20, 30, ?

- A) 36
- B) 40
- C) 42
- D) 44

179. What comes next?

AZ, BY, CX, DW, ?

- A) EV
- B) FU
- C) EX
- D) EZ

180. If 3 cats catch 3 mice in 3 minutes, how many cats are needed to catch 100 mice in 100 minutes?

- A) 3
- B) 4
- C) 1
- D) 100