Sindh MDCAT Paper 2025

(conducted by IBA-Sukkur)

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Section I (Biology)

1. Overconsumption of which of the following foods increases the risk of calcium oxalate stone?
a. Leafy vegetables
b. Fruits contain Vitamin C
c. Fruits contain high fiber
d. Whole grains

2. Which product is produced by genetically modified bacteria for patients with Diabetes mellitus?
a. Insulin
b. Erythropoietin
c. Growth hormone
d. Vaccine

3. Which changes occur in the endometrium during the proliferative phase of the menstrual cycle?
a. It begins to shed
b. It regenerates and thickens
c. It becomes secretory
d. No change occurs

4. Role of mRNA in COVID-19 vaccines like Pfizer and Moderna is to:
a. Helps the immune system recognize the virus
b. Instructs cells to produce the viral spike protein
c. Triggers immediate antibody release from memory cells
d. Delivers enzymes that destroy the virus

5. Living cells of cartilage are called as:
a. Osteocytes
b. Thrombocytes
c. Chondrocytes
d. Osteoblasts

6. The regulator of muscle contraction, which is released from sarcoplasmic reticulum is:
a. Tropomyosin
b. Troponin
c. Calcium ions
d. ATP

7. Automatic and rapid actions that do not involve the conscious part of brain is:
a. Reflex actions
b. Conditioned reflexes
c. Taxes
d. Synapses

8. Crossing over involves exchange of genetic material between:
a. Sister chromatids of same chromosome
b. Non-sister chromatids of homologous chromosomes
c. Chromatids of non-homologous chromosomes
d. Sister chromatids of homologous chromosomes

9. Name the biomolecule essential for information storage and transmission within cells.
a. Carbohydrates
b. Lipids
c. Nucleic acids
d. Proteins

10. What is the chemical composition of chromosomes?
a. RNA and lipids
b. DNA and proteins
c. Carbohydrates and nucleic acids
d. Proteins and carbohydrates

11. Which of the following surrounds myofibril in skeletal muscle that stores and distributes calcium ions during muscle functioning?
a. Sarcolemma
b. Sarcoplasmic reticulum
c. Transverse tubules
d. Sarcoplasm

12. Shivering thermogenesis involves:
a. Voluntary muscle contraction
b. Involuntary muscle contraction
c. Dehydration
d. Hormone secretion

13. Guanine-cytosine pairs enhance DNA stability due to:
a. Larger size
b. Closer pairing
c. More hydrogen bonds
d. Double ring structure in both

14. Which of the following neurons conduct impulses from sensory receptors to CNS:
a. Sensory neurons
b. Motor neurons
c. Efferent neurons
d. Interneurons

15. Why Lamarck is being remembered till today?
a. Due to his rejected but appealing theory of heredity
b. Due to his universally acceptable theory of evolution
c. Due to his accepted theory of heredity
d. Due to his theory of evolution by natural selection

16. Which of the following is NOT related to DNA?
a. Adenine
b. Thymine
c. Uracil
d. Guanine

17. If a male with hemophilia marries a non-carrier female, what is the likelihood of their sons inheriting the condition?
a. 50 %
b. 100 %
c. 0 %
d. 25 %

18. Which of the following is a characteristic of a non-competitive enzyme inhibitor?
a. Binds to the enzyme active site
b. Can be overcome by increasing substrate concentration
c. Increases the speed of the reaction
d. Point of action is allosteric site

19. Which of the following events prevent backflow of blood from ventricles to atria during ventricular systole?
a. Contraction of the atrial wall muscles
b. Closure of tricuspid and bicuspid valves
c. Opening of semilunar valve
d. Opening of tricuspid and bicuspid valves

20. In the following process the cells release energy from oxidation of food molecules?
a. Cellular respiration
b. Photosynthesis
c. DNA replication
d. Protein synthesis

21. How many NADH are produced, when one Acetyl Co-A is oxidized during Krebs' cycle?
a. 1
b. 2
c. 3
d. 6

22. Which of the following best describes glycoproteins?
a. Proteins linked with carbohydrates
b. Proteins linked with DNA
c. Proteins linked with lipids
d. Proteins linked with minerals

23. The function which is common between Cerebellum and Hippocampus is:
a. Equilibrium
b. Memory formation
c. Body positioning
d. Sexual arousal

24. In males, which of the following is considered a urogenital organ?
a. Urethra
b. Ureter
c. Urinary bladder
d. Vas deferens

25. The most common type of arthritis is:
a. Gout
b. Rheumatoid arthritis
c. Osteoarthritis
d. Spondylitis

26. The other name for interstitial cells in male testes is:
a. Leydig cell
b. Spermatogonia cell
c. Sertoli cell
d. Spermatocyte

27. Binding of hemoglobin with oxygen is catalyzed by the enzyme:
a. Carbonic anhydrase
b. Carboxylase
c. Oxygenase
d. Dehydrogenase

28. Transfer of phosphate from one compound to the other compound requires an enzyme called:
a. Oxidoreductase
b. Transferase
c. Hydrolase
d. Ligase

29. Linkage of genes in *Drosophila* was first discovered by:
a. Thomas Hunt Morgan
b. Alfred Sturtevant
c. Gregor Mendel
d. Hugo de Vries

30. Which phenomenon increases the chances of variations?
a. Crossing Over
b. Linkage
c. Epistasis
d. Dominance

31. When antibodies produced by B-cells kill the antigens then it is called:
a. Cell mediated response
b. Passive response
c. Humoral response
d. Cells collaborated response

32. B-lymphocytes are formed and matured in:
a. Liver
b. Spleen
c. Bone marrow
d. Thymus

33. Which of the following is a route of HIV transmission?
a. Unhygienic living conditions
b. Blood transfusion with contaminated blood
c. Hand shaking
d. Living together in the same room

34. Which part of small intestine is responsible for nutrient absorption?
a. Duodenum
b. Jejunum
c. Ileum
d. Rectum

35. 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

36. If the disease is caused due to a defective gene located on the X chromosome, then defective gene can only be transmitted to male offspring by the:
a. Female gamete
b. Male gamete
c. Bacteria
d. Mutation

37. Which group of viruses can cause diseases like influenza, measles and rabies?
a. Plant viruses
b. Animal viruses
c. Fungal viruses
d. Bacteriophages

38. Which of the following biological molecules releases highest energy from its one gram?
a. Carbohydrates
b. Lipids
c. Protein
d. Water

39. The best way to avoid AIDS is:
a. Preventive measures
b. Vaccination
c. Medication
d. Shots

40. Which of the following substances pass through the glomerulus into Bowman's capsule?
a. Glucose
b. Red blood cells
c. Platelets
d. Albumin

41. The appendix is attached to which part of large intestine?
a. Rectum
b. Caecum
c. Colon
d. Ileum

42. Which structural characteristic is most accurate for arteries?
a. Thin walls with valves
b. Thick and muscular walls
c. Highly permeable walls
d. Large lumen lacking muscle

43. A food sample contains long chains of amino acids bounded together. This indicates the presence of:
a. Carbohydrates
b. Lipids
c. Proteins
d. Nucleic acids

44. Monoclonal antibodies are useful in cancer diagnosis by:
a. Replacing damaged tissue
b. Changing the genetic code of cancer cells
c. Killing healthy cells to reduce tumor spread
d. Detecting specific tumor markers in samples

45. The main function of the pharynx in respiratory system:
a. Serves as passage for both food and air
b. Produces mucus
c. Produces voice
d. Filters air

46. The main cause of acute kidney failure is:
a. Less sweating
b. Hypothermia
c. Liver failure
d. Drinking of excess water

47. During diastole, the heart chambers:
a. Relax and fill with blood
b. Contract strongly
c. Eject blood into arteries
d. Remain closed

48. Kidneys perform their osmoregulatory role under the effect of Antidiuretic Hormone, which type of urine is produced in this situation?
a. Hypotonic urine with decreased volume
b. Hypotonic urine with increased volume
c. Hypertonic urine with decreased volume
d. Hypertonic urine with increased volume

49. A person has swollen lymph nodes after throat infection. What does this indicate?
a. Failure of circulatory system
b. Extra glucose storage
c. Active immune response
d. Blockage of digestive tract

50. Which of the following is correct about the structure of brain?
a. Cerebral cortex is outer part consists of grey matter
b. Cerebral medulla is inner part consists of grey matter
c. Cerebral cortex is inner part consists of white matter
d. Cerebral medulla is outer part consists of white matter

51. Under a microscope plant cells appeared rigid in shape, unlike flexible animal cells. Which structure explains this difference?
a. Cell wall
b. Vacuole
c. Cytoskeleton
d. Plasma membrane

52. Which type of joint allows bending of the elbow joint and has a synovial cavity?
a. Cartilaginous joint
b. Fibrous joint
c. Pubic symphysis
d. Hinge joint

53. If a round seeded pea plant is self-fertilized and all of its offspring are also round seeded:
a. Both parents and offspring must be true breed
b. Both parents and offspring may be true breed
c. Only parents but not offspring will be true breed
d. Only offspring but not parents will be true breed

54. A student observes a microorganism under a microscope that lacks a nucleus and is made of a single cell. Which classification would best fit this organism?
a. Unicellular prokaryote
b. Unicellular eukaryote
c. Multicellular eukaryote
d. Multicellular prokaryote

55. In biotechnology vaccines can be developed by cloning of:
a. Gene for antigen of pathogen
b. Gene for receptor of the patient
c. Gene for antigen of patient
d. Gene for antibody of patient

56. Atrioventricular valve closed during which phase of cardiac cycle:
a. Ventricular systole
b. Ventricular diastole
c. Atrial systole
d. Atrial diastole

57. If "RrYy" is crossed with "rryy", what will be the ratio of "RRYY" to "rryy" in F_2 generation?
a. 9 : 3 : 3 : 1
b. 3 : 1
c. 1 : 3
d. 1 : 1

58. Name the idea of Darwin that best explains the ability of populations to reproduce those individuals who possess beneficial traits.
a. Gene flow
b. Genetic drift
c. Artificial selection
d. Natural selection

59. At least how many saccharide units must be present in polysaccharide?
a. 1
b. 2
c. 10
d. 11

60. A doctor taps below the knee and the leg kicks forward. What does this show?
a. A conditional response
b. Voluntary muscle contractions
c. An involuntary reflex to external stimuli
d. A delayed response due to brain processing

61. If fertilization does not occur, which part of uterus degenerates?
a. Myometrium
b. Endometrium
c. Perimetrium
d. Cervix

62. Which process uses mRNA to make protein at ribosomes?
a. Replication
b. Transcription
c. Translation
d. Cell fractionation

63. Which of the following is the sexually transmitted disease?
a. Syphilis
b. Lung cancer
c. Tuberculosis
d. Autoimmune disorders

64. The Golgi apparatus is structurally made of a series of flattened membrane-bounded sacs:
a. Grana
b. Cristae
c. Cisternae
d. Vesicles

65. Which type of change is a nerve impulse?
a. Electrical and mechanical change
b. Chemical and mechanical change
c. Electrical and chemical change
d. Chemical change only

66. Which of the following fluid flows through the lymphatic vessels?
a. Plasma
b. Lymph
c. Bile
d. Serum

67. Which one of the following is the most common nitrogenous waste excreted in urine of a healthy human?
a. Ammonia
b. Urea
c. Uric acid
d. Creatinine

68. Hippocampus mainly involved in:
a. Vision and hearing reflexes
b. Voluntary muscles movement
c. Memory storage
d. Speech production

69. The covalently bonded non-protein part of enzyme is called:
a. Activator
b. Prosthetic group
c. Coenzyme
d. Apoenzyme

70. The outer surface of the axon membrane in a resting neuron is:
a. Negative due to sodium ions
b. Positive due to sodium ions
c. Positive due to potassium ions
d. Neutral due to balanced ions

71. Which class of animals excrete ammonia as their primary nitrogenous waste?
a. Uricotelic
b. Urotelic
c. Ammonotelic
d. Ureotelic

72. Which of the following best describes the direction of impulse traveling in a typical neuron?
a. Axon → dendrite → cell body
b. Dendrite → cell body → axon
c. Synapse → axon → dendrite
d. Cell body → dendrite → axon

73. Homopolysaccharide that is found in the cell wall of fungi and in the exoskeleton of arthropods is:
a. Cellulose
b. Glycogen
c. Starch
d. Chitin

74. The most abundant lipids in living things are:
a. Terpenes
b. Waxes
c. Steroids
d. Acylglycerols

75. Name the type of bond that join amino acids to form a polypeptide chain:
a. Hydrogen bond
b. Ionic bond
c. Glycosidic bond
d. Peptide bond

76. Which of the following is *not* a globular protein?
a. Enzyme
b. Hormone
c. Channel protein
d. Collagen

77. Which specialized cells of liver perform phagocytic function?
a. Kupffer cells
b. Schwann cells
c. Parietal cells
d. Chief cells

78. According to Darwin, the main force behind evolution is:
a. Migration
b. Genetic mutation
c. Artificial selection
d. Natural selection

79. Beside fertilization, the function of fallopian tube is:
a. Nourishment of embryo
b. Transport of ovum towards uterus
c. Secretion of female hormones
d. Implantation of zygote

80. Which property of water allows it to stick to polar surface like wood?
a. Density
b. Adhesion
c. Cohesion
d. Non-polar attraction

81. The water content of human kidney is regulated by ADH. Which of the following gland is involved in its secretion process?
a. Adrenal gland
b. Pituitary gland
c. Thyroid gland
d. Parathyroid gland

Part II – Chemistry

82. The heat of formation of CO and CO_2 are –26.4 Kcal and –94.0 Kcal respectively. The heat of combustion of carbon monoxide according to Hess's Law will be:
a. +26.4 Kcal
b. –67.6 Kcal
c. –94.0 Kcal
d. –120.4 Kcal

83. Rate of dehydration of alcohol is:
a. 3° > 2° > 1°
b. 1° > 3° > 2°
c. 2° > 3° > 1°
d. 3° > 1° > 2°

84. For which reaction, the value of Kc increases with increase in temperature?
a. $CH_4 + O_2 \rightarrow CO_2 + H_2O$
b. $NaOH + HCl \rightarrow NaCl + H_2O$
c. $2SO_2 + O_2 \rightarrow 2SO_3$
d. $H_2 + I_2 \rightarrow 2HI$

85. Correct order of bond energy will be:
a. HCl > HBr > HI
b. HBr > HCl > HI
c. HI > HCl > HBr
d. HCl > HI > HBr

86. Which of the following is least volatile?
a. Glycerol
b. Water
c. Acetic acid
d. Diethyl ether

87. IUPAC name of the compound $CH_3(CH_2)_4CH(CH_3)_2$:
a. 2-methylheptane
b. 3-methylheptane
c. 4-methylheptane
d. Octane

88. IUPAC name of the compound $C_2H_5CH = C(C_3H_7)\ C_2H_5$ is:
a. 1,2-diethyl-2-propylethene
b. 3-ethylhept-3-ene
c. 4-ethylhept-3-ene
d. 4-ethylhept-2-ene

89. Which of the following molecules have similar molecular shape?
a. NH_3 & $AlCl_3$
b. BCl_3 & NH_3
c. $AlCl_3$ & PCl_3
d. H_2O & $SnCl_2$

90. Value of electronegativity of atoms A and B are 1.20 and 4.0 respectively, the percent ionic character will be:
a. 43 %

b. 50 %
c. 55 %
d. 73 %

91. Phenol differs from ethanol because it:
a. Forms stronger hydrogen bonds to its aromatic ring
b. Is more acidic because of resonance-stabilized conjugate base
c. Readily undergoes nucleophilic substitution at the -OH group
d. Is completely insoluble in water due to its benzene ring

92. Which reagent and condition are used to bring about the reaction shown?
Toluene → p-chloro toluene
a. Cl_2 in the dark
b. Cl_2 in the presence of $AlCl_3$
c. Cl_2 in the presence of UV light
d. Concentrated HCl heated under reflux

93. What is 50 % yield when actual yield and theoretical yield are 2 g and 4 g respectively?
a. 25 %
b. 50 %
c. 75 %
d. 85 %

94. IUPAC name of CHCCl is:
a. Chloroethane
b. Chloroethyne
c. Chloroethene
d. Ethylchloride

95. The order of reactivity of following R–X for S^{N2} reaction is:
a. RF > RCl > RBr > RI
b. RBr > RF > RCl > RI
c. RCl > RF > RBr > RI
d. RI > RBr > RCl > RF

96. Among the following compounds, the most susceptible to nucleophilic attack on carbonyl carbon is:
a. CH_3COCl
b. CH_3CHO
c. CH_3COOCH_3
d. $CH_3COOCOCH_3$

97. Which of the following is expected to be the most paramagnetic?
a. Li
b. Be
c. B
d. C

98. The formation of activated complex in a reaction is:
a. Exothermic process
b. Endothermic process
c. Either endo or exo
d. Always energy released

99. The maximum probability of finding an electron is at a distance of:
a. 0.53 nm

b. 0.35 nm
c. 0.053 nm
d. 0.0053 nm

100. The IUPAC name of Vinyl acetylene is:
a. But-1-en-3-yne
b. But-3-en-1-yne
c. Pent-3-en-1-yne
d. Pent-2-en-4-yne

101. Which atom has at least single electron in dumbbell-shape orbital?
a. H
b. He
c. Li
d. B

102. Which of following adhesive is used to bond broken pieces of jewelry?
a. Super glue
b. Epoxy resin
c. Silicon resin
d. Starch

103. Ratio of sigma bonds and pi bonds present in benzene are:
a. 4 : 1
b. 1 : 4
c. 2 : 3
d. 6 : 1

104. Which one is addition polymer?
a. Polyvinyl chloride
b. Nylon 6,6
c. Nylon 6,10
d. Polyester

105. When one mole of a substance is decomposed preferably as compared to evaporation then decomposition has:
a. Low energy
b. High energy
c. Equal energy
d. Cannot be predicted

106. At start of reaction:
a. Average rate is high
b. Instantaneous rate is high
c. Both rates are same
d. Both rates are slow

107. Which is *not* true about benzene:
a. Sp^2 hybridization
b. Fractional bond order
c. No elimination reaction
d. 6 sites for monosubstitution

108. During Clemmensen reduction of aldehyde and ketone, carbonyl group into alkane is carried out with:
a. H_2 and Pd

b. $LiAlH_4$
c. Zn/Hg conc. HCl
d. NH_2-NH_2/KOH

109. Consider the given reaction:
$N_2 + 3H_2 \rightarrow 2NH_3$
If 56 g of N_2 reacts with 12 g of H_2 and produces 51 g of NH_3, what is the theoretical yield (TY) of NH_3 and the percentage yield (PY) of the reaction?
(Molar mass of N_2 = 28 g/mol, H_2 = 2 g/mol, NH_3 = 17 g/mol)
a. TY = 68 g and PY = 75 %
b. TY = 34 g and PY = 67 %
c. TY = 68 g and PY = 33 %
d. TY = 34 g and PY = 75 %

110. When SHE is connected with Cu electrode using salt bridge and external wire:
a. Cu reduces
b. Cu^+ reduces
c. H^+ reduces
d. H_2 reduces

111. The ionic compound among the following with the highest lattice energy is:
a. LiF
b. NaCl
c. KCl
d. CsI

112. All of following have two bond pairs and show linear geometry except:
a. $SnCl_2$
b. CS_2
c. HCN
d. CO_2

113. If ionization energy of an element is greater then:
a. More is its reducing power
b. More is its electropositivity
c. Less is its metallic character
d. More is its atomic radius

114. Which compound will *not* show geometrical isomerism:
a. But-2-ene
b. 1,2-dimethylcyclopropane
c. Pent-1-ene
d. 1,3-dimethylcyclopentane

115. The mass of hydrogen gas needed to produce 51 g ammonia:
a. 6 g
b. 9 g
c. 12 g
d. 15 g

116. Digestion of protein started when food enters in:
a. Mouth
b. Stomach
c. Intestine
d. Epiglottis

117. Select the standard condition for temperature and pressure:
a. 1 atm and 0 K
b. 760 torr and 25 °C
c. 2 bar and 25 °C
d. 14.7 psi and 0 °C

118. Which of the following is *NOT* a state function?
a. Enthalpy
b. Work
c. Internal energy
d. Pressure

119. Which one is not a type of stereoisomerism?
a. Conformational isomerism
b. Optical isomerism
c. Geometrical isomerism
d. Metamerism

120. Formic acid reacts with ethanol in presence of acid catalyst produces:
a. Ester
b. Ether
c. Acid anhydride
d. Phenol

121. K is called specific rate constant because it is:
a. Rate per unit concentration
b. Temperature independent
c. Depends on concentration
d. Unitless

122. Number of sigma bonds in methyl chloride is due to sp^3-s overlap is/are:
a. 1
b. 2
c. 3
d. 4

123. When pressure is 1520 torr then density of oxygen gas will be:
a. 64/RT
b. 32/RT
c. 16/RT
d. 128/RT

124. Which equation is used to calculate concentration for *n* mole of an ideal gas?
a. P/RT
b. PV/RT
c. PVM/RT
d. PM/RT

125. 50 g of Mg is burnt with 32 g of oxygen to form MgO, amount of excess reagent left is:
a. 6 g Mg
b. 2 g Mg
c. 8 g O_2
d. 16 g O_2

126. Which carbonyl carbon is more electrophilic:
a. HCOOH

b. HCHO
c. CH_3COCH_3
d. CH_3COOH

Part III (Physics)

127. An electron is projected along the positive x-axis in a magnetic field lying in xz-plane. The magnetic force on the electron will act along the:
a. x-axis
b. z-axis
c. y-axis
d. –y-axis

128. The magnetic flux through a loop of 1 m^2 in a 0.5 T magnetic field is same as magnetic flux through a loop of 0.5 m^2 in a magnetic field of:
a. 1.0 T at 0°
b. 1.0 T at 60°
c. 2.0 T at 90°
d. 0.5 T at 90°

129. A body of mass 10 kg is falling through a viscous medium and reached terminal velocity. The net force on the body will be:
a. 0 N
b. 9.8 N
c. 98 N
d. 980 N

130. The value of temperature coefficient of a conductor is zero. This indicates that with the rise in temperature, resistance of conductor:
a. Increases
b. Decreases
c. Remain same
d. Becomes zero

131. The path difference between two sound waves coming from a coherent source of wavelength 50 cm at a point is 100 cm. The superposition of the waves at that point produces:
a. Beats
b. Echo
c. Loudness
d. Silence

132. Potential energy decreases in the process of:
a. Compressing a spring
b. Stretching a spring
c. Releasing a stretched spring
d. Holding the spring at maximum extension

133. A diver of mass *m* is swimming at a depth *h* below the sea level. If the reference level is taken at sea level, the gravitational potential energy of the diver is:
a. 0
b. mgh
c. –mgh
d. 2mgh

134. A constant force *F* acts on a body and displaces it by distance Δd in a time Δt. The rate at which force is doing work is:
a. F × Δd
b. F × Δt
c. F × Δd / Δt
d. F × Δt / Δd

135. In circular motion, if angular displacement is kept constant, decreasing the radius will:
a. Increase linear displacement
b. Increase linear velocity
c. Decrease linear displacement
d. Not affect linear displacement

136. When force and displacement are in opposite direction then the work done is said to be:
a. Positive
b. Negative
c. Infinite
d. Maximum

137. In a step-up transformer, if the secondary voltage is increased by a factor of 10, the current in secondary coil will be:
a. 10 times higher than the primary current
b. 10 times lower than the primary current
c. Equal to the primary current
d. One-tenth of the primary current in transformer

138. When a droplet reaches terminal velocity, its acceleration is:
a. Zero
b. Variable
c. Not changed
d. Negative

139. Newton's original formula underestimated speed of sound in air because he:
a. Ignored viscosity
b. Assumed isothermal
c. Considered vacuum conditions
d. Assumed adiabatic

140. The point where the electric field is zero between two opposite charges lies:
a. Closer to the positive charge
b. At the mid-point
c. Closer to the negative charge
d. Nowhere between them

141. Consider these two vectors A = 2i + 3j and B = –6i + 4j. The angle between these two vectors is:
a. 0°
b. 90°
c. 120°
d. 180°

142. A displacement-time graph is a straight line inclined up at angle of 45° with X-axis; velocity of body according to this graph is:
a. Increasing
b. Decreasing

c. Constant
d. Decreasing at start and then may decrease

143. A 150 kg car has its velocity reduced from 20 m/s to 10 m/s in 3.0 sec. How large was the average retarding force?
a. 500 N
b. 2500 N
c. 1500 N
d. 1000 N

144. The phenomenon of interference of sound waves requires:
a. Two sources with different frequencies
b. Two coherent sources
c. A single source
d. A single source and a reflecting surface

145. A gas expands from 1 m^3 to 3 m^3 at constant pressure of 2 Pa. Work done is:
a. 2 J
b. 4 J
c. 6 J
d. 8 J

146. If frequency of AC is doubled, the inductive reactance will:
a. Remain same
b. Be halved
c. Be doubled
d. Become zero

147. The force between two charges is 28 N in vacuum. If paraffin wax of relative permittivity 2.8 is introduced between the charges as a medium, then the force reduces to:
a. 25 N
b. 20 N
c. 15 N
d. 10 N

148. A body moves along a semicircular path of radius 10 m from one end of the diameter to the other. The ratio of distance to displacement is:
a. $\pi : 1$
b. $1 : \pi$
c. $\pi : 2$
d. $2 : \pi$

149. A body is projected with speed v making an angle θ with the horizontal and covers horizontal range R. If its speed is doubled, the new range will be:
a. R / 2
b. R
c. 2R
d. 4R

150. A ball of mass m strikes a wall and rebounds with the same speed in the opposite direction, taking the initial direction as positive, the change in the momentum of the ball is:
a. 0
b. mv
c. –2 mv
d. –mv

151. A point lies 3 m from a +5 µC charge and 4 m from a –3 µC charge. The most appropriate direction of the net electric field at this point is directed:
a. Away from +5 µC charge
b. Towards +5 µC charge
c. Away from the –3 µC charge
d. Perpendicular to the line joining the charges

152. The increase in kinetic energy associated with decreased pressure of a fluid in a horizontal pipe is a consequence of the:
a. Bernoulli's Principle
b. Equation of continuity
c. Pascal's principle
d. Torricelli's theorem

153. The electric field at a point due to a point charge is 200 N/C. If suppose a –4 C test charge is placed at that point then the magnitude of electric field and electric force on it is:
a. 200 N/C and 50 N
b. 200 N/C and 200 N
c. 200 N/C and 800 N
d. 800 N/C and 800 N

154. Internal resistance reduces the terminal voltage because it:
a. Produces back emf
b. Causes power loss inside the battery
c. Increases the current
d. Decreases the emf

155. The angle formed at the center of a circle as a body moves from one position to another is:
a. Angular displacement
b. Angular velocity
c. Angular acceleration
d. Angular momentum

156. During the drilling of a metal surface the drill bit heats up. This heat comes from the:
a. Vibration of the tool
b. Work done against friction
c. Flow of electric current
d. Compression of air

157. If 2 J of work is done in moving two coulombs of charge from one point to the other in an electric field. The potential difference between the points is:
a. 1 J/C
b. 2 J/C
c. 1 / J C
d. 2 / J C

158. The motion of transverse waves involves particle's vibration:
a. Along the wave direction
b. Opposite to energy flow
c. Perpendicular to wave propagation
d. In random direction at every point

159. In laminar flow of fluid, its adjacent layers:
a. Resist each other
b. Mix with each other

c. Slide smoothly pass each other
d. Produce turbulence

160. A body moving in a circle, half revolution in terms of radians is equivalent to:
a. π
b. $\pi / 6$
c. $\pi / 2$
d. 2π

161. If A = (a i + b j) and B = 4 (a i + b j), magnitude of A × B =
a. $4 (a^2 + b^2)$
b. 4 a b k
c. 8 (a + b)
d. 0

162. A proton and an alpha particle enter in the same magnitude with equal speeds, compared to proton, the alpha particle's path will have:
a. Larger radius
b. Smaller radius
c. Smaller path length
d. Greater deflection

Part IV [English]

163. The board will approve the budget only after the auditor verifies the accounts. The most appropriate passive voice for the given sentence is:
a. The budget will be approved by the board only after the accounts are verified by the auditor.
b. The budget is approved by the board only after the accounts have been verified by the auditor.
c. The budget is being approved by the board only after the accounts are verified by the auditor.
d. The budget has been approved by the board only after the accounts were verified by the auditor.

164. Identify the simile:
a. She trembled like a leaf in the wind.
b. She was a statue, frozen in fear.
c. She was drowning in doubt.
d. Her thoughts were a whirlwind.

165. "His lachrymose speech at the funeral moved everyone to tears." Choose the synonym for *lachrymose*:
a. Joyful
b. Weepy
c. Monotonous
d. Humorous

166. He said, "Will you listen to such a man?" Choose the most appropriate indirect speech conversion from the given options:
a. He asked them that they would listen to such a man.
b. He asked them whether they would listen to such a man.
c. He told them whether they will listen to such a man.
d. He asked them to listen to such a man.

167. Choose the sentence in which "only" indicates that Jamila was the only person who spoke about her tiredness.
a. Only Jamila said she was tired.

b. Jamila only said she was tired.
c. Jamila said only she was tired.
d. Jamila said she was only tired.

168. Choose the correct sentence:
a. The new policy aims at reduce waste, to promote recycling, and creating awareness among citizens.
b. The new policy aims to reducing waste, promoting recycling, and create awareness among citizens.
c. The new policy aims to reduce waste, to promote recycling, and creating awareness among citizens.
d. The new policy aims to reduce waste, promote recycling, and create awareness among citizens.

169. The purpose of using exaggerated language in parody is:
a. To create a serious tone
b. To criticize societal norms
c. To entertain and mock
d. To confuse the reader

170. Choose the word with incorrect spelling:
a. Immigrant
b. Ancestors
c. Montessori
d. Pregmetic

171. He does his work *without any care*. The underlined part of the sentence is:
a. Adverb phrase
b. Adjective phrase
c. Noun phrase
d. Appositive phrase

Part V [Logical Reasoning]

172. A spying agent coded *POWER* as QPXFS. Using this pattern, what will be the code for *GUNED*?
a. HVPFE
b. HVRFE
c. HVOFE
d. IVRFG

173. A new virus is spreading rapidly in the city. The government should impose temporary travel restrictions. What is true about this course of action?
a. Travel restrictions help control the virus spread
b. The government should promote travel to support the economy
c. Travel restrictions do not affect virus transmission
d. People should disregard government advice

174. A tank can hold 240 liters of water. Currently, water is filled to one-third of its capacity. How much more water can it hold?
a. 60 liters
b. 80 liters
c. 100 liters
d. 160 liters

175. M, N, P, Q, S, ??
a. T
b. U
c. V
d. W

176. If Amna is older than Muneeb, and Muneeb is younger than Jaffar, then Amna is:
a. Amna is older than Jaffar
b. Amna is younger than Jaffar
c. Amna and Jaffar are the same age
d. There is not enough information to say

177. Statements: All melons are apples. No apples are mangoes.
Which of the following conclusions about the given statements are true?

Conclusion I: All melons are mangoes.
Conclusion II: Apples are not mangoes.

a. Only I
b. Only II
c. Both I and II
d. Neither I nor II

178. In a family of six members:

- P is the father of Q
- R is the mother of Q
- S is the sister of Q
- T is the brother of P

Who is the Uncle of Q?
a. P
b. R
c. S
d. T

179. If A is mother of B and C is child of B, then what is the relationship between A and C?
a. Aunt
b. Grandmother
c. Sister
d. Cousin

180. Which number comes in the missing place?
120, 119, 117, 114, 110, _____

a. 95
b. 100
c. 105
d. 107