
SINDH MDCAT PAST PAPER: 2024

#Biology

1. In which part of the brain a set of neurosecretory cells are found that exert control over the anterior pituitary gland by secreting releasing and inhibiting hormones?

- A. Pons**
- B. Hypothalamus ✓**
- C. Hippocampus**
- D. Amygdala**
- E. Midbrain**

2. Frostbites are due to:

- A. Fluid retention**
- B. Vasodilation**
- C. Muscular expansion**
- D. Vasoconstriction ✓**
- E. Vascular contraction**

3. Stimuli such as pressure, touch, stretch, motion stimulate which of the following receptors?

- A. Thermoreceptors**
- B. Mechanoreceptors ✓**
- C. Gustatory receptors**
- D. Olfactory receptors**
- E. None of these**

4. The situation when two alternative forms is said to have:

- A. Codominance**
- B. Sex-influenced traits**
- C. Multiple alleles**
- D. Incomplete dominance ✓**
- E. Sex-limited traits**

5. Bacterium, with a tuft of flagella present at each of two poles, is called:

- A. Amplitrichous**
- B. Atrichous**
- C. Lophotrichous ✓**
- D. Peritrichous**
- E. Monotrichous**

6. What is the correct order of organelles in ultracentrifugation?

- A. Ribosome → Nuclei → Mitochondria**
- B. Lysosome → Ribosome → Mitochondria**
- C. Nuclei → Mitochondria → Ribosome ✓**
- D. Mitochondria → Nuclei → Golgi bodies**
- E. Golgi bodies → Ribosome → Nuclei**

7. A peptide hormone, released from Sertoli cells, inhibiting secretion of FSH is:

- A. Testosterone**
- B. GnRH**
- C. FSH**
- D. Inhibin ✓**
- E. Luteinizing hormone**

8. Name the protein complex which stabilizes the separated strand of DNA during replication:

- A. Double-stranded binding proteins**
- B. Double-stranded binding enzymes**
- C. Single-stranded binding proteins ✓**
- D. Single-stranded binding enzyme**
- E. Non-stranded binding proteins**

9. Which of the following is not essential for photosynthesis?

- A. Oxygen ✓**
- B. Chlorophyll**
- C. ATP**
- D. Light**
- E. NADP**

10. Proteins which cause disease in humans and animals are called:

- A. Prions ✓**
- B. Viroid**
- C. Prophage**
- D. Bacteriophage**

11. Which size of sponge can filter an entire residential pool in one day?

- A. Tennis ball-sized**
- B. Ladle-sized**
- C. Basket ball-sized ✓**
- D. Hockey ball-sized**
- E. Teaspoon-sized**

12. Koshland proposed a model for enzyme with the name of "Induced Fit Model" in the year:

- A. 1957 ✓**
- B. 1952**
- C. 1954**
- D. 1956**
- E. 1949**

13. Why do ribosomes require Mg^{++} ions?

- A. To synthesize protein**
- B. To transport amino acid to ribosome**
- C. To stabilize the ribosomal structure ✓**
- D. To develop mRNA molecules**
- E. To break down RNA molecules**

14. Hemoglobin fails to carry sufficient oxygen, leading to death of a person when:

- A. Glutamic acid is replaced by Valine at 3rd position**
- B. Glutamic acid is replaced by Valine at 6th position ✓**
- C. Glutamic acid is replaced by Valine at 5th position**
- D. Glutamic acid is replaced by Valine at 4th position**
- E. Glutamic acid is replaced by Valine at 2nd position**

15. Formation of hard uric acid crystals in the joints is identified as:

- A. Rheumatoid arthritis**
- B. Ankylosing spondylitis**
- C. Osteoarthritis**
- D. Callus**
- E. Gout ✓**

16. Which virus kills cancer cells and aids immunity?

- A. Saccharomyces**
- B. Lactobacillus**
- C. Penicillium**
- D. Lymphobacterium**
- E. Oncolytic ✓**

17. The pigment in the muscles responsible for the binding of oxygen is:

- A. Oxyhemoglobin**
- B. Plasmin**
- C. Myoglobin ✓**
- D. Heme**
- E. Hemoglobin**

18. In Gram -ve bacteria, the peptidoglycan layer is:

- A. Condensed**
- B. Thick**
- C. Moderate**
- D. Thin ✓**
- E. Entangled**

19. The human enzymes are highly active at about:

- A. 8°C**
- B. 15°C**
- C. 37°C ✓**
- D. 45°C**
- E. 55°C**

20. The locomotion in segmented worms is brought about by:

- A. True Pods**
- B. Pseudopodia**
- C. Segmented ✓**
- D. Peritrichous flagella**

21. The type of carbohydrates, made up of 6 to 10 monosaccharides, which are comparatively less sweet in taste and less soluble in water, are called:

- A. Oligosaccharides ✓**
- B. Monosaccharides**
- C. Starch**
- D. Cellulose**
- E. Polysaccharides**

22. This technique is used to determine growth of bacteria, rate of photosynthesis, and minute quantity of DNA:

- A. Electrophoresis**
- B. Micrometry**
- C. Microscopy**
- D. Chromatography**
- E. Spectrophotometry ✓**

23. Which of the following is an example of a sub-viral particle that infects plants?

- A. Prion**
- B. Viroid ✓**
- C. Bacteriophage**
- D. Infectious protein**

24. In heterotrophs, during digestion, macromolecules are broken into monomers by hydrolysis with the help of:

- A. Chymosin**
- B. Gastrin**
- C. Remin**
- D. Hydrolytic enzyme ✓**
- E. Endonuclease**

25. Animals that have a ladder-type nervous system, consisting of two nerve cords and connecting nerves that look like a ladder, belong to the phylum:

- A. Protozoa**
- B. Coelenterata**
- C. Cnidarian**
- D. Porifera**
- E. Platyhelminthes ✓**

26. The term enzyme was coined by:

- A. Darwin**
- B. Lamarck**
- C. Friedrich Wilhelm Kuhn ✓**
- D. Mendel**
- E. Thomas Cech**

27. Which lipophilic hormone is found in every tissue of the body and is involved in dealing with inflammation, blood flow, and protection from injury?

- A. Estradiol**
- B. Aldosterone**
- C. Testosterone**
- D. Prostaglandins ✓**
- E. Estrogen**

28. Hardy-Weinberg Equation is:

- A. $p^2 + 2pq + q^2 = 1$ ✓**
- B. $p + 2pq + q^2 = 1$**
- C. $p^2 + 2pq + q^2 = 0$**
- D. $2p + q^2 = 1$**
- E. $2p + 2q^2 = 1$**

29. F.C Steward used this plant for his experiment i.e (tissue culture):

- A. Radish**
- B. Corn**
- C. Maize**
- D. Carrot ✓**
- E. Mango**

30. Histone proteins are rich in:

- A. Basic amino acid ✓**
- B. Acidic fatty acid**
- C. Basic citric acid**
- D. Acidic amino acid**
- E. Basic fatty acid**

31. The site of maturation and storage of sperms is:

- A. Seminal vesicles**
- B. Scrotum**
- C. Testes**
- D. Epididymis ✓**
- E. Vasa differentia**

32. A disease resulting in complete lack of spermatozoa in ejaculate is:

- A. Azospermia ✓**
- B. Obstruction**
- C. Oligospermia**
- D. Zoospermia**
- E. Ejaculation disorder**

33. The type of bacteria which oxidize CO into CO₂ is:

- A. Bacillus oligocacprobillous**
- B. Hydrogenomonas**
- C. Pseudomonas**
- D. Thiobacillus ✓**
- E. Azobacter**

34. What structure holds sister chromatids together?

- A. Gene**
- B. Nucleosome**
- C. Centrosome**
- D. Centromere ✓**
- E. Histone protein**

35. The most widely accepted explanation for ascent of sap is:

- A. Role of root pressure**
- B. Transpiration**
- C. Capillarity**
- D. Role of atmospheric pressure**
- E. Cohesion and transpiration pull ✓**

36. In which of the following environments are plants, with aerenchyma, most likely to be found?

- A. Mesophytes**
- B. Sciophytes**
- C. Xerophytes**
- D. Hydrophytes ✓**
- E. Halophytes**

37. Each helix of DNA is made up of four types of nucleotides and both helices are complementary to each other i.e. if one helix contains Adenine the opposite helix will contain:

- A. Histidine**
- B. Uracil**
- C. Cytosine**
- D. Thymine ✓**
- E. Guanine**

38. Bacteriophages escape from host cells by the activity of:

- A. Non-Ribosome**
- B. Lysozyme ✓**
- C. Peroxisome**
- D. Lysosome i**

39. Which soft-bodied animal is usually Ambisexual?

- A. Tapeworm**
- B. Earthworm ✓**
- C. Jellyfish**
- D. Snail**
- E. Oyster**

40. The number of teeth in deciduous and permanent teeth is:

- A. 21 and 32 respectively**
- B. 18 and 22 respectively**
- C. 12 and 32 respectively**
- D. 10 and 32 respectively**
- E. 20 and 32 respectively ✓**

41. Which hormone is responsible to convert the ruptured follicle into a yellowish glandular mass known as corpus luteum?

- A. FSH**
- B. ACTH**
- C. DHT**
- D. LH ✓**
- E. TSH**

42. Phage genome incorporated with host DNA is called:

- A. Bacteriophage**
- B. Viroids**
- C. Prophage ✓**
- D. Prions**

43. Plants oxidize sugar in chloroplasts during day time without production of energy. This process is called:

- A. Decarboxylation ✓**
- B. Oxidative phosphorylation**
- C. Non-cyclic photophosphorylation**
- D. Cyclic oxidative phosphorylation**
- E. Lactic acid fermentation**

44. Sufficient depolarization in neurolemma results in:

- A. Potassium leakage**
- B. Resting membrane potential**
- C. Action potential ✓**
- D. Repolarization**
- E. Sub-threshold potential**

45. Fusion of two genetically dissimilar parents through artificial pollination is:

- A. Selection**
- B. Acclimatization**
- C. Hybridization ✓**
- D. Evolution**
- E. Back crossing**

46. In the flowering plant, food is trans located in the form of:

- A. Starch**
- B. Sucrose ✓**
- C. Glucose**
- D. Sugar**
- E. Fructose**

47. Which reaction is also known as Z-scheme?

- A. Oxidative phosphorylation**
- B. Cyclic photophosphorylation**
- C. Non-cyclic oxidative phosphorylation**
- D. Cyclic oxidative phosphorylation**
- E. Non-cyclic photophosphorylation ✓**

48. In gel electrophoresis, how do molecules migrate through the gel?

- A. Under the influence of agar**
- B. By diffusion**
- C. Under the influence of an electric field ✓**
- D. Active transport**
- E. By osmosis**

49. In carbohydrates, hydrogen and oxygen are present in the simple ratio of:

- A. 2:1 ✓**
- B. 3:1**
- C. 1:1**
- D. 3:4**
- E. 1:3**

50. Which of the pigments are common in both human and plant?

- A. Carotenoids ✓**
- B. Fucoxanthin**
- C. Xanthophyll**
- D. Chlorophyll**
- E. Retinol**

51. Two different gene pairs, located at different loci, all work for a same trait and express in an additive manner. This phenomenon is called:

- A. Codominance**
- B. Polygenic inheritance ✓**
- C. Multiple alleles**
- D. Incomplete dominance**
- E. Epistasis**

52. Isolation of cellular components to determine their structure and chemical composition is:

- A. Cell fractionation ✓**
- B. Chromatography**
- C. Microscopy**
- D. Spectrometry**
- E. Electrophoresis**

53. The type of cancer, common in young men between the ages of 15 and 34, that has a high cure rate with early treatment is:

- A. Skin cancer**
- B. Lung cancer**
- C. Blood cancer**
- D. Lymph cancer**
- E. Testicular cancer ✓**

54. This process inhibits metabolism and growth of anaerobic microbes used for the treatment of Gas Gangrene:

- A. Desiccation**
- B. Radiation**
- C. Hyperbaric oxygen therapy ✓**
- D. High-pressure process**
- E. Lyophilization**

55. The branching network-like arrangement of cardiac muscles is called:

- A. Epimysium**
- B. Syndesmosis**
- C. Gomphosis**
- D. Sarcolemma**
- E. Syncytium ✓**

56. Molecules that bind to an enzyme away from the active site and increase the function of that active site are known as:

- A. Activation energy without enzyme**
- B. Energy of reactants**
- C. Activation energy with enzyme**
- D. Energy of product**
- E. Allosteric activators ✓**

57. The number of oxygen molecules that is transported by one hemoglobin molecule is:

- A. 1**
- B. 4 ✓**
- C. 3**
- D. 2**
- E. 5**

58. The top milk-producing animal is:

- A. Nili-Ravi ✓**
- B. Bhadawari**
- C. Godavari**
- D. Blue-Ravi**
- E. Jaffrabadi**

59. Which one of the following is the precursor for the synthesis of testosterone, progesterone, and estrogens?

- A. Choline**
- B. Cholesterol ✓**
- C. Oil**
- D. Waxes**
- E. Albumin**

60. A neural cable extending from the brain down through the backbone and enclosed in the vertebral column is called:

- A. Meninges**
- B. Spinal cord ✓**
- C. Axon**
- D. Brainstem**
- E. Hindbrain**

61. Which of the following accurately describes *Helicobacter pylori*?

- A. Flagellated rod-shaped bacterium
- B. Flagellated chain bacterium
- C. Flagellated spiral-shaped bacterium ✓
- D. Non-flagellated spiral-shaped bacterium
- E. Non-flagellated rod-shaped bacterium

62. Water has very high heat of vaporization i.e.:

- A. 274 kcal/kg
- B. 374 kcal/kg ✓
- C. 474 kcal/kg
- D. 574 kcal/kg
- E. 674 kcal/kg

63. Which cells are responsible for the formation of cartilage?

- A. Neurosecretory cells
- B. Lymphocytes
- C. Osteocytes
- D. Leukocytes
- E. Chondrocytes ✓

64. Which statement about tautomerism is correct?

- A. Only occurs in organic compounds
- B. Not influenced by temperature
- C. Have same molecular formula ✓
- D. Have different molecular formula
- E. Identical chemical properties

65. Behavioral responses are controlled by:

- A. Pituitary gland**
- B. Hypothalamus ✓**
- C. Thalamus**
- D. Amygdala**
- E. Hippocampus**

66. In skeletal muscles, which tube runs perpendicularly and is connected with the sarcoplasmic reticulum?

- A. Troponin**
- B. T-tubules ✓**
- C. Monochondrion**
- D. Myosin**
- E. Actin**

67. The active site of the enzyme is the region that:

- A. Binds with the product of catalytic reaction**
- B. Is involved in catalytic reactions ✓**
- C. Is inhibited by coenzymes and cofactors**
- D. Binds allosteric regulators of the enzyme**
- E. Is inhibited by coenzymes only**

68. It is a condition of blindness where a person cannot distinguish blue color:

- A. Protanopia**
- B. Monochromacy**
- C. Dichromacy**
- D. Deuteranopia**
- E. Tritanopia ✓**

CHEMISTRY

69. Chelate means:

- A. Bidentate ✓**
- B. Ion**
- C. Monodentate**
- D. Crab claws**
- E. Metal**

70. The shape of an ammonia molecule is:

- A. Angular**
- B. Tetrahedral**
- C. Linear**
- D. Planar**
- E. Pyramidal ✓**

71. It is used as a preservative and antibacterial agent in livestock feed:

- A. Butyric acid**
- B. Formic acid**
- C. Caroic acid**
- D. Propionic acid ✓**
- E. Valeric acid**

72. The charge of electron is:

- A. $1.602 \times 10^{-16} \text{C}$**
- B. $1.602 \times 10^{-15} \text{C}$**
- C. $1.602 \times 10^{-17} \text{C}$**
- D. $1.602 \times 10^{-18} \text{C}$**
- E. $1.602 \times 10^{-19} \text{C}$ ✓**

73. The equilibrium of this reaction would not be affected by an increase in pressure:

- A. $2\text{SO}_2 + \text{O}_2 \rightleftharpoons 2\text{SO}_3$
- B. $\text{N}_2 + \text{O}_2 \rightleftharpoons 2\text{NO}$ ✓
- C. $2\text{NO} + \text{Cl}_2 \rightleftharpoons 2\text{NOCl}$
- D. $\text{PCl}_5 \rightleftharpoons \text{PCl}_3 + \text{Cl}_2$
- E. $\text{CO} + 3\text{H}_2 \rightleftharpoons \text{CH}_4 + \text{H}_2\text{O}$

74. The density of benzene is:

- A. 0.80 g/cm^3
- B. 0.88 g/cm^3 ✓
- C. 0.85 g/cm^3
- D. 0.82 g/cm^3
- E. 0.08 g/cm^3

75. According to Raoult's law, the relative lowering of vapor pressure is equal to:

- A. Mole fraction of solute ✓
- B. Mole fraction of solvent
- C. Molarity
- D. Molality
- E. Parts per million

76. When an unsymmetrical alkene undergoes addition reactions, the negative part of attacking reagent is added to that double-bonded carbon atom which contains:

- A. Highest number of chloride atoms
- B. Lesser number of hydrogen atoms ✓
- C. Highest number of hydrogen atoms
- D. Moderate number of hydrogen atoms
- E. Lesser number of chloride atoms

77. According to Charles, at 0° K (-273.15°C.), the volume of a gas should be:

- A. -2
- B. Zero ✓
- C. -1
- D. +2
- E. +1

78. The paramagnetic behavior of molecules such as oxygen molecules cannot be explained by:

- A. Molecular orbital theory
- B. Hybridization
- C. Valence bond theory
- D. Valence shell electron pair repulsion theory ✓
- E. Chemical bonding

79. The decomposition of H_2O_2 is inhibited by:

- A. MnO_2
- B. Ethanol
- C. Glycerin ✓
- D. V_2O_5

80. It transports oxygen from the lungs to every tissue of the body:

- A. Hemoglobin ✓**
- B. Proteins**
- C. Hormones**
- D. Lipids**
- E. Antibodies**

81. The bond length between C-C in benzene is:

- A. 1.34 Å**
- B. 1.39 Å ✓**
- C. 1.56 Å**
- D. 1.38 Å**
- E. 1.46 Å**

82. "In an orbital of an atom, no two electrons can have the same set of four quantum numbers, at least one quantum number must be different." This statement is:

- A. Aufbau principle**
- B. Pauli's exclusion principle ✓**
- C. Hund's rule**
- D. Wissewser rule**
- E. Magnetic quantum number**

83. IUPAC name of isopropyl alcohol is:

- A. 1-butanol**
- B. 2-propanol ✓**
- C. 1-propanol**
- D. 2-butanol**
- E. propanol**

84. The unit of rate constant for the first order reaction is:

- A. conc. s^{-1}
- B. $\text{M}^2 \text{s}^{-1}$
- C. s^{-1} ✓
- D. $\text{M}^{-1} \text{s}^{-1}$
- E. $\text{M} \cdot \text{s}^{-1}$

85. Volume is a:

- A. Intensive property
- B. Entropy
- C. Path function
- D. Isolated system
- E. State function ✓

86. Collection of gas over water is an example of:

- A. Boyle's law
- B. Avogadro's law
- C. Dalton's law ✓
- D. Graham's law
- E. Gay-Lussac law

87. Dry ice is the example of:

- A. Molecular solid ✓
- B. Metallic solid
- C. Covalent solid
- D. Ionic solid
- E. Plastic

88. Low atmospheric pressure system is called:

- A. Diffusion
- B. Depression ✓
- C. Effusion
- D. Contraction
- E. Cooling

89. The pH value of human blood is:

- A. 7.80
- B. 7.35 ✓
- C. 7.33
- D. 6.62
- E. 7.05

90. It is used to distinguish between primary, secondary, and tertiary alcohol:

- A. Tollens Reagent
- B. Grignard Reagent
- C. Benedict Reagent
- D. Bloor Reagent
- E. Lucas Reagent ✓

91. An example of an endothermic reaction is:

- A. Photosynthesis ✓
- B. Synthesis of NH_4
- C. Nuclear fission
- D. Oxidation of sulfur gases
- E. Burning of fuel and coal

92. Stoichiometry is the study of ___ relationship between reactants and products in a chemical reaction by using a balanced chemical equation:

- A. Quantitative ✓
- B. Qualitative
- C. Chemical
- D. Descriptive
- E. Physical

93. Ketones, when treated with LiAlH_4 , reduce to:

- A. Primary alcohol
- B. Tertiary alcohol
- C. Alcohol
- D. Dihydric alcohol
- E. Secondary alcohol ✓

94. The term "active mass" used in the Law of Mass Action means:

- A. Number of moles per dm^3 ✓
- B. Number of moles per dm^2
- C. Gram per dm^3
- D. Number of moles
- E. Number of molecules

95. The neutron was discovered by:

- A. Max Planck
- B. Neil Bohr
- C. J.J. Thomson
- D. Goldstein
- E. James Chadwick ✓

96. When chlorobenzene reacts with sodium hydroxide at 350°C and 150 atmospheric pressure, it gives rise to the formation of:

- A. Sodium chromate**
- B. Phenol ✓**
- C. Sodium phenoxide**
- D. Sodium sulfate**
- E. Phenoxide**

97. The carboxylic acid is stronger than:

- A. PCl_5**
- B. H_2SO_4**
- C. HNO_3**
- D. HCl**
- E. CH_3OH ✓**

98. The initial discovery of natural gas in Pakistan dates back to ____ when it was found in the Sui area of Baluchistan:

- A. 1955**
- B. 1954 ✓**
- C. 1956**
- D. 1952**

99. Reduction of aldehydes & ketones by Zn-Hg amalgam and concentrated HCl results in conversion to an alkane. This reaction is known as:

- A. Down Reduction**
- B. Cope Reduction**
- C. Wolff-Kishner Reduction**
- D. Clemmensen Reduction ✓**
- E. Sodium tetrahydroboride**

100. Deficiency of ____ causes loss of weight, appetite, and taste:

- A. K
- B. P
- C. Fe
- D. Zn ✓

101. The rate of SN_1 mechanism depends upon:

- A. Concentration of nucleophile
- B. Concentration of both substrate and nucleophile
- C. Polar non-polar solvent
- D. Concentration of substrate only ✓
- E. Concentration of reactant

102. Total number of alpha amino acids are:

- A. 19
- B. 27
- C. 22 ✓
- D. 25
- E. 28

103. Aldehydes & ketones can be converted to alkane. This reaction is called:

- A. Ozonolysis
- B. Wolff-Kishner reaction
- C. Grignard reaction
- D. Friedel-Craft reaction
- E. Clemmensen reaction ✓

104. An example of a bidentate ligand among the following is:

- A. Br⁻
- B. CN⁻
- C. C₂O₄²⁻ ✓
- D. OH⁻
- E. Cl⁻

105. Fuel cell is a typical galvanic cell which is based on reaction between:

- A. Hydrogen and copper
- B. Methane and oxygen
- C. Hydrogen and oxygen ✓
- D. Nitrogen and oxygen
- E. Hydrogen and zinc

106. The alkali metal that gives a yellow color during a flame test is:

- A. Ba
- B. Na
- C. K ✓
- D. Cs

107. Which of the following possesses the weakest London dispersion forces?

- A. F₂
- B. Br₂
- C. Cl₂
- D. I₂
- E. He ✓

108. Which of the following liquids shows maximum surface tension?

- A. Water
- B. Mercury ✓
- C. Ethyl alcohol
- D. Chloroform
- E. Benzene

109. Hydroquinone is a phenol; it contains two -OH groups at:

- A. Position 1 and 2
- B. Position 1 and 3
- C. Position 2 and 4 ✓
- D. Position 2 and 3

110. Generally, actual yield is:

- A. Less than theoretical yield ✓
- B. Equal to the theoretical yield
- C. Greater than theoretical yield
- D. Greater than percent yield

111. Formic acid is naturally found in:

- A. Butter
- B. Goat
- C. Milk
- D. Vinegar
- E. Ants ✓

112. Urea was first synthesized by Wohler from an inorganic material named:

- A. Ammonium bicarbonate**
- B. Ammonium nitrate**
- C. Ammonium oxalate**
- D. Ammonium cyanate ✓**
- E. Ammonium chloride**

113. Oil of Vitriol refers to:

- A. Caustic soda**
- B. Alum**
- C. Borax**
- D. Sulfuric acid ✓**
- E. Nitric acid**

114. The number of five-membered and six-membered rings in Buckyball are respectively:

- A. 40 and 20**
- B. 12 and 12 ✓**
- C. 5 and 15**
- D. 14 and 14**
- E. 12 and 20**

115. It is an example of a crystalline solid:

- A. Plastics**
- B. Charcoal**
- C. Glass**
- D. Alum ✓**
- E. Rubber**

116. The structure of primary amines is:

- A. Trigonal
- B. Tetrahedral pyramidal ✓
- C. Planar
- D. Linear
- E. Regular tetrahedral

117. Mostly p block elements react with ____ to form binary compounds:

- A. Oxygen ✓
- B. Water
- C. Halogens
- D. Nitrogen
- E. Hydrogen

118. Maximum number of electrons in a given sub-shell are calculated by:

- A. n^2
- B. $2(n+1)$
- C. $2n^2$
- D. $2l+1$ ✓
- E. $2+1$

119. This shape is found in AX₂ when the bond angle is 180°

- A. Pyramidal
- B. Bent
- C. Triangle
- D. Tetrahedral
- E. Linear ✓

120. A colloidal solution of liquid into liquid is known as:

- A. Solid foam**
- B. Foam**
- C. Fog**
- D. Emulsion ✓**

121. These hydrocarbons contain one or more double or triple bonds between the two adjacent carbon atoms in their structure:

- A. Alkenes and alcohol**
- B. Alkenes and cycloalkanes**
- C. Alkanes and alkyl halides**
- D. Alkenes and alkynes ✓**
- E. Alkanes and alkenes**

122. Conjugated acid of NH_3 is:

- A. NH_4^+ ✓**
- B. NH**
- C. NH_2**
- D. NH_2^-**
- E. NH_3**

PHYSICS

123. The linear momentum of a photon is given as:

- A. mc**
- B. mv**
- C. mc_2**
- D. mc_2**
- E. $h\nu/c$ ✓**

124. The unit of resistance is:

- A. Volt**
- B. Watt**
- C. Coulomb**
- D. Ohm ✓**
- E. Ampere**

125. Longitudinal waves do not exhibit:

- A. Reflection**
- B. Diffraction**
- C. Polarization ✓**
- D. Interference**
- E. Refraction**

126. One kilogram mass is entirely converted into energy. The amount of energy will be:

- A. 9×10^9 J**
- B. 3×10^{10} J**
- C. 9×10^{16} eV**
- D. 9×10^{16} J ✓**
- E. 9×10^{15} eV**

127. The unit of resistivity is:

- A. Ohm m ✓**
- B. Ampere**
- C. Volt**
- D. Watt**
- E. Ohm**

128. The SI unit of power is:

- A. Ampere**
- B. Coulomb**
- C. Ohm**
- D. Watt ✓**
- E. Volt**

129. Total potential difference across the combination of three similar cells becomes maximum when:

- A. Two cells are connected in series and the third cell in parallel with the combination**
- B. All the three cells are connected in parallel**
- C. Two cells are connected in parallel and the third cell in series with the combination**
- D. The load connected to the combination is minimum**
- E. All the three cells are connected in series ✓**

130. Which one of the following is correct for a transformer?

- A. Transformer converts ac into ac**
- B. Transformer converts mechanical energy into electrical energy**
- C. Transformer works on the principle of mutual induction ✓**
- D. Transformer converts ac into dc**
- E. Transformer converts electrical energy into mechanical energy**

131. Time rate of change of linear momentum is equal to:

- A. Moment of force**
- B. Force ✓**
- C. Angular momentum**
- D. Torque**
- E. Moment**

132. In projectile motion, the horizontal component of acceleration is:

- A. Zero ✓**
- B. 9.8 m/s^2**
- C. 19.6 m/s^2**
- D. 4.9 m/s^2**

133. Which of the following statements is correct?

- A. Work can never be converted into heat.**
- B. Work can be converted completely into heat.**
- C. Both heat and work are inter-convertible. ✓**
- D. Heat can never be converted into work.**
- E. Heat can be converted completely into work.**

134. The force responsible for simple harmonic motion of a simple pendulum is:

- A. $mg \cos \theta$**
- B. $mg \tan \theta$**
- C. $mg \sin^2 \theta$**
- D. $mg \sin \theta$ ✓**

135. "The current through a conductor is directly proportional to the potential difference between the ends of the conductor, provided that physical conditions remain the same." This is:

- A. Laplace's Law**
- B. Ohm's Law ✓**
- C. Coulomb's Law**
- D. Charles's Law**
- E. Boyle's Law**

136. The measure of energy between any two points on a circuit is:

- A. Resistance**
- B. Electromotive force**
- C. Internal resistance**
- D. Resistivity**
- E. Potential difference ✓**

137. If electronic transitions in hydrogen atom terminate in the second orbit, the emitted series is known as:

- A. Brackett series**
- B. Paschen series**
- C. Lyman series**
- D. Balmer series ✓**
- E. Pfund series**

138. The force experienced by a current-carrying conductor placed in a magnetic field is:

- A. $F = qBL \sin \theta$**
- B. $F = BL \sin \theta$**
- C. $F = qvB \sin \theta$**
- D. $F = BL \cos \theta$**
- E. $F = BIL \sin \theta$ ✓**

139. The ratio of 'molar gas constant' to 'Avogadro's number' (R/NA) is called:

- A. Stefan's constant**
- B. Boltzmann constant ✓**
- C. Rydberg's constant**
- D. Coulomb's constant**
- E. Planck's constant**

140. "The electric force between two static point charges varies directly to the product of charges with each charge and inversely with the square of the distance between them." This is:

- A. Gay-Lussac's Law**
- B. Coulomb's Law ✓**
- C. Faraday's Law**
- D. Charles's Law**
- E. Boyle's Law**

141. In radioactivity, the product of half-life $T_{1/2}$ and decay constant λ is equal to:

- A. 0.693 ✓**
- B. 0.396**
- C. 0.953**
- D. 0.963**
- E. 0.369**

142. The change in potential energy per unit charge between two points in an electric field is:

- A. Retentivity**
- B. Potential difference ✓**
- C. Intensity**
- D. Permittivity**
- E. Permeability**

143. Which of the following statements is correct?

- A. A magnetic field exerts a force if the charge particle moves opposite to the magnetic field.**
- B. A magnetic field never exerts a force on a charge particle.**
- C. A magnetic field exerts a force if the charge particle moves parallel to the magnetic field.**
- D. A magnetic field exerts a force if the charge particle moves perpendicular to the magnetic field. ✓**

144. Resistivity depends on:

- A. Weight of material**
- B. Charge of material**
- C. Shape of material**
- D. Size of material**
- E. Temperature of material ✓**

145. The speed of electromagnetic waves 'c' in free space is:

- A. $c = 3 \times 10^8$ m/s ✓**
- B. $c = 3 \times 10^6$ m/s**
- C. $c = 3 \times 10^{10}$ m/s**
- D. $c = 3 \times 10^5$ m/s**

146. The constant power output of a machine is 6W. The energy delivered by it in 2 minutes is:

- A. 12 joules**
- B. 720 joules ✓**
- C. 72 joules**
- D. 3 joules**
- E. 120 joules**

147. The process in which all the supplied heat is converted into work is called:

- A. Isochoric**
- B. Isobaric**
- C. Adiabatic**
- D. Isotropic**
- E. Isothermal ✓**

148. The charge to mass ratio (e/m) of an electron is:

- A. 1.9×10^{31} C/kg**
- B. 1.76×10^{19} C/kg**
- C. 1.76×10^{11} C/kg ✓**
- D. 1.602×10^{19} C/kg**
- E. 1.602×10^{11} C/kg**

149. If the instantaneous velocity of a body is equal to the average velocity, then:

- A. The body moves with decreasing velocity**
- B. The body moves with variable acceleration**
- C. The body moves with uniform velocity ✓**
- D. The body moves with uniform acceleration**
- E. The body moves with increasing velocity**

150. The waves that require medium for their propagation are known as:

- A. Electromagnetic waves**
- B. De Broglie waves**
- C. Mechanical waves ✓**
- D. Particle waves**
- E. Matter waves**

151. The SI unit of the electric field is:

- A. J C^{-2}**
- B. N C^{-1} ✓**
- C. $\text{Nm}^2 \text{C}^{-1}$**
- D. C N^{-2}**
- E. $\text{Nm}^2 \text{C}^{-2}$**

152. An electron and proton enter in a magnetic field perpendicularly with the same momentum:

- A. They move undeflected in opposite directions**
- B. The electron deflects more than the proton**
- C. They will deflect equally ✓**
- D. The proton deflects more than the electron**
- E. They will not deflect at all**

153. A body starts from rest and falls freely under gravity, the distance covered by it in 't' seconds is:

- A. $0.5gt^2$ ✓**
- B. g^2t**
- C. $0.5g^2t^2$**
- D. g^2t^2**

154. The total energy E of a body at any instant, executing simple harmonic motion, is:

- A. $E = -2kx^2$**
- B. $E = 0.5(kx^2)$ ✓**
- C. $E = -kx^2$**
- D. $E = kx^2$**

155. A reverse-biased semiconductor diode acts as:

- A. Rectifier**
- B. On switch**
- C. Inverter**
- D. Off switch ✓**
- E. Amplifier**

156. For maximum work done by a constant force, the angle between force and displacement is:

- A. 45°**
- B. 90°**
- C. 65°**
- D. 145°**
- E. 0° ✓**

157. A body is moving in a circle with constant speed. Which of the following statements is true?

- A. There is a force acting on the body at a tangent to the circle**
- B. There is a force acting on the body toward the center of the circle ✓**
- C. There is no acceleration in the body**
- D. There is a force acting on the body away from the center of the circle**
- E. The net force acting on the body is zero**

158. The unit of potential difference is:

- A. Ampere**
- B. Coulomb**
- C. Volt ✓**
- D. Watt**
- E. Ohm**

159. In SI system, the specific heat capacity is measured in:

- A. $\text{J kg}^{-1} \text{K}^{-1}$ ✓**
- B. $\text{J K}^{-1} \text{g}^{-1}$**
- C. $\text{J kg}^{-1} \text{C}^{-1}$**
- D. $\text{J g}^{-1} \text{C}^{-1}$**

160. The period of uniform circular motion is given as:

- A. $T = \omega/2\pi$
- B. $T = 2\pi/\omega$ ✓
- C. $T = 2\pi \omega$
- D. $T = 2\pi T$
- E. $T = 2\pi \omega^2$

161. In the mathematical relationship $\phi = hv$, the symbol ϕ represents:

- A. Magnetic flux
- B. Threshold frequency
- C. Work function ✓
- D. Electric flux
- E. Wave function

162. The unit of current is:

- A. Volt
- B. Ohm
- C. Watt
- D. Coulomb per second ✓
- E. Coulomb

163. Fast moving electrons stopped by a heavy metallic target in an evacuated glass tube give rise to the production of:

- A. Beta-rays
- B. Gamma-rays
- C. X-rays ✓
- D. Cosmic rays
- E. Alpha-rays

164. The alternating emf (ξ) generated by an AC generator is given by:

- A. $\xi = BvL \sin \theta$
- B. $\xi = NBL \sin \theta$
- C. $\xi = NBL \cos \theta$
- D. $\xi = BNA \sin \theta$ ✓
- E. $\xi = BvL \cos \theta$

165. In N-type semiconductor, the minority carriers are:

- A. Photons
- B. Electrons
- C. Protons
- D. Holes ✓
- E. Neutrons

166. The binding energy of a deuteron (HF) is 2.3 MeV, its binding energy per nucleon will be:

- A. 0.51 MeV
- B. 0.2 MeV
- C. 1.02 MeV ✓
- D. 1.1 MeV
- E. 1 MeV

167. The mathematical relationship between Magnetic flux and magnetic flux density is:

- A. $\Delta\phi = (B.(A.\cos\theta)$ ✓
- B. $\Delta\phi = (B.(\Delta t) \cos\theta$
- C. $B = (\Delta\phi)(\Delta t) \cos\theta$
- D. $B = (\Delta\phi)(\Delta t)$
- E. $\Delta\phi = (B.(\Delta t)$

168. If the length of a simple pendulum is increased four times, its frequency:

- A. Increases 2 times**
- B. Decreases 4 times**
- C. Remains the same**
- D. Increases 4 times**
- E. Decreases 2 times ✓**

169. In the equation of nuclear decay $p^1 \rightarrow n^1 + x$, x is:

- A. Proton**
- B. Positron**
- C. Electron ✓**
- D. Photon**
- E. Gamma ray**

170. A force of magnitude 10N is acting along x-axis, its component along y-axis is:

- A. Zero ✓**
- B. 5N**
- C. 20N**
- D. 10N**
- E. 25N**

171. The proton number of a nucleus increases after emission of:

- A. Negative β particle ✓**
- B. Positive β particle**
- C. Proton**
- D. Alpha particle**
- E. Neutron**

172. $\Sigma\Gamma = \Sigma/\sigma$ is called:

- A. Coulomb
- B. Constant of proportionality
- C. Relative permittivity of the medium ✓
- D. Permittivity of the space
- E. Permittivity of the medium

173. Newton (N) is not the SI unit of:

- A. Centripetal force
- B. Tension
- C. Coulomb's force
- D. Friction
- E. Momentum ✓

174. Faraday's law of electromagnetic induction is mathematically represented as:

- A. $\varepsilon = -N (\Delta B/\Delta t)$
- B. $\varepsilon = -N (\Delta I/\Delta t)$
- C. $\varepsilon = -M (\Delta\phi/\Delta t)$
- D. $\varepsilon = -N (\Delta\phi/\Delta t)$ ✓
- E. $\varepsilon = -M (\Delta\phi/\Delta t)$

175. In law of radioactive decay $N = N_0 e^{(-\lambda t)}$, the ratio N/N_0 is called:

- A. Activity
- B. Relative activity ✓
- C. Absolute activity
- D. Stability
- E. Decay constant

176. In Einstein's photoelectric equation $h\nu = \phi + eV_0$, the kinetic energy of photoelectrons is:

- A. $K.E_{\max} = \phi + eV_0$**
- B. $K.E_{\max} = \phi - eV_0$**
- C. $K.E_{\max} = \phi - h\nu$**
- D. $K.E_{\max} = h\nu - \phi$ ✓**
- E. $K.E_{\max} = h\nu - eV_0$**

#ENGLISH

177. Spot the error in the given sentence: "The stories that she makes up for the children ought to be written down and published."

- A. For ✓**
- B. Down**
- C. Ought**
- D. Stories**
- E. And**

178. Read the passage and choose the best option:

"As the big door swung behind me, I heard the sound of a roar of laughter that went up to the roof of the bank. Since then I use a bank no more. I keep my money in my pocket and my savings in silver dollars in a sock." Where did the writer put his savings in?

- A. Pocket**
- B. Silver box**
- C. Bank**
- D. Pocket**
- E. Sock ✓**

179. Choose the correct option:

Although he very ill, he managed to write a letter to his son.

- A. He managed to write a letter to his son
- B. He was very ill, he managed to write a letter to his son
- C. He managed to write a letter to his son although he was very ill
- D. Although he was very ill, he managed to write a letter to his son ✓

180. Read the passage below and choose the best option for the statement:

"John Keats (1795–1821) was born in London and educated at the Enfield School, where a sympathetic headmaster inspired his passion for literature. After leaving school, he qualified himself for surgery but abandoned it for poetry. He published his first volume of verse in 1817 and "Endymion" in 1818. 1818 was indeed a tragic year for Keats. His brother Tom, whom he nursed devotedly through his last illness, died of Tuberculosis. Soon after his brother's death, Keats himself developed symptoms of the same disease. In a vain attempt to save his health and life, some of Keats' friends arranged for him to go to Italy. He died and was buried at Rome. His death at an early age was perhaps the greatest disaster to befall English poetry."

John Keats and his brother died of this disease:

- A. Diabetes
- B. Alzheimer's disease
- C. Pneumonia
- D. Cancer
- E. Tuberculosis ✓

181. Choose the correct phrase for the sentence given below:

The aero plane travelled 5,000 meters before it took on.

- A. Take into
- B. Took off ✓
- C. Take over
- D. Took away
- E. Take on

182. Choose the best possible option from the given homophones:
How will they get across the river if the _____ is not running?

- A. Furry
- B. Fairly
- C. Fairy
- D. Ferry ✓
- E. Fury

183. Choose the best possible antonym for the underlined word:
"The general's problem was to get 20,000 troops swiftly across this river."

- A. Slowly ✓
- B. Expeditiously
- C. Thoroughly
- D. Anxiously
- E. Strongly

184. Choose the correct sequenced option for the underlined words in the paragraph below:

With the invention of the personal computer and the internet, a new age in communications begins.

Now people could communicate fastest and more easily than ever before. Writing, editing, and storing information became quick and easy. It was no longer necessary to write draft after draft when changes could be made so easily using a word processor program.

- A. Longer – With – Faster – Writing – Editing – Word – Now
- B. With – Faster – Writing – Editing – Longer – Word – Now
- C. With – Now – Faster – Writing – Editing – Longer – Word ✓
- D. Editing – Now – Faster – Writing – Longer – Word
- E. With – Now – Faster – Writing – Editing – Longer – Word

185. The synonym of the word "Oblivion" is:

- A. Forgetful ✓
- B. Observant
- C. Shabby
- D. Daunted

186. Choose the best option:

Some of the race teams were still looking for ____ equipment.

- A. Its
- B. It's
- C. There
- D. Their ✓
- E. It

187. Read the passage and choose the best option:

Nobody has ever been able to compute with any exactness how many people took part in the great rout of 1913, for the panic, which extended from the Winslow Bottling Works in the south and to Clintonville, six miles north, ended abruptly as it began. The shouting, weeping, tangled evacuation of the city lasted not more than two hours in all. Few people got as far east as Reynoldsburg, twelve miles away; fifty or more reached the Country Club, eight miles away; most of the others gave up, exhausted, or climbed trees in Franklin Park, four miles out.
"Most of the people gave up and climbed trees in:"

- A. Winslow Bottling
- B. Clintonville
- C. Reynoldsburg
- D. Country Club
- E. Franklin Park ✓

188. Choose the correct prepositional phrase for the sentence given below:

"In today's session, he ____ the current situation of Pakistan."

- A. Suffers from
- B. Belongs to
- C. Begs for
- D. Compares with
- E. Comments on ✓

189. Spot the error in the given sentence:

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"The bushes on the corner make it difficult for the driver to see the traffic approaching from the write."

- A. Write ✓**
- B. For**
- C. Make**
- D. Approaching**
- E. Bushes**

**190. Punctuate the following sentence:
He said will you have time to play regularly**

- A. He said, 'Will you have time to play regularly?' ✓**
- B. He said, Will you have time to play regularly?**
- C. He said, "Will you have time to play regularly."**
- D. He said 'Will you have time to play regularly'.**
- E. He said, 'Will you have time to play regularly'.**

**191. Complete the main clause of the following sentence:
If I went to Paris, _____.**

- A. I can see the Eiffel Tower**
- B. I must see the Eiffel Tower**
- C. I should see the Eiffel Tower**
- D. I could see the Eiffel Tower**
- E. I would see the Eiffel Tower ✓**

192. Correct the spelling & capitalization errors in the paragraph below:

It was in Korea, June 1953. I had been wounded, and they had strapped me on a stretcher and dumped me by the roadside to wait for an ambulance. If I didn't peg out first, I wanted to die anyway. I had nothing to live for. The pain was pretty bad, I guess I fainted. When I came to, there was a Korean girl sitting beside me. She was about fourteen; not pretty, of course; but friendly blue eyes and long plates hanging in front of her shoulders. She didn't say anything. She just smiled. And I smiled back.

- A. Korea – June – Strapped – Roadside – Peg – Pretty – Fainted – Korean – Sitting – Blue – Platis – Shoulders ✓**
- B. Strapped – Roadside – Peg – Pretty – Fainted – Korean – Sitting – Blue – Platis – Shoulders**
- C. Korea – June – Peg – Pretty – Fainted – Korean – Sitting – Blue – Platis – Shoulders**
- D. Korea – Strapped – Roadside – Peg – Sitting – Blue – Platis – Shoulders**
- E. Korea – June – Strapped – Pretty – Blue – Platis – Shoulders**

193. Choose the correct form of the tense:

I would gladly have helped him if he ____ me into confidence.

- A. Took**
- B. Has taken**
- C. Had taken ✓**
- D. Have taken**
- E. Takes**

194. Choose the correct preposition:

The thief made an escape by ____.

- A. Climbing up the wall
- B. Climbing on the wall
- C. Climbing to the wall
- D. Climbing over the wall ✓
- E. Climbing into the wall

#LOGICAL REASONING

195. Read the statement given, assume it is true, and select the correct course of action:

A public sector television channel is worried about the quality of its programs and, considering the competition from several private sector television channels, has decided to provide some incentives in order to attract talent for its programs.

Course of action:

- A. Public sector television channel has decided to revise its fee structure for artists.**
- B. It should not revise its fee structure until the private sector channels do so.**

- A. Both A and B follow**
- B. Only A follows ✓**
- C. Only B follows**
- D. Neither A nor B follows**
- E. Either A or B follows**

196. Parveen, Qadir, Rehan, Salim, and Tehmina are five people in a family. If Parveen is the daughter of Qadir, Qadir is the son of Rehan,

Rehan is the father of Salim, while Tehmina is the daughter of Parveen, then which of the following is true?

- A. Rehan is the uncle of Parveen
- B. Qadir is the grandfather of Parveen
- C. Qadir is the daughter of Salim
- D. Parveen is the daughter of Tehmina
- E. None of these ✓

197. Look at the numbers below. Identify the pattern and logically deduce the correct option that should follow:

1, 4, 9, 16, ____

- A. 54
- B. 36
- C. 49
- D. 25 ✓

198. Read the two statements given and select the correct option

- A. Advances in cancer chemotherapy have made more drugs available today.
- B. A large number of cancer patients now have a better outcome.

- A. Both statements A and B are effects of some common cause.
- B. Statement A is the cause and statement B is the effect. ✓
- C. Both statements A and B are effects of independent causes.
- D. Statement B is the cause and statement A is the effect.
- E. Both statements A and B are independent causes.

199. Which number is a multiple of its digits?

- A. 21
- B. 44
- C. 52
- D. 24 ✓
- E. 13

**200. Look at the alphabets below. Identify the pattern and choose the correct option that should follow next:
VSA, WRD, XQG, YPJ, _____**

- A. VTC
- B. TLK
- C. MOZ
- D. ZOM ✓
- E. ZNE