

MCQs: 200

Time: 3.5 hours

No Negative Marking

BIOLOGY

1. Catalase can be activated at pH:
 - a. 1
 - b. 3
 - c. 5
 - d. 7
2. Enzymatic activity can be inhibited by?
 - a. Heavy metal ions
 - b. Methane
 - c. Mutase
 - d. Noble gases
3. A competitive inhibitor:
 - a. Accelerates the chemical reaction
 - b. Competes with the enzyme
 - c. Is irreversible
 - d. Is reversible
4. Wings of birds and that of flying lizards provide evidence of:
 - a. Convergent evolution
 - b. Divergent evolution
 - c. No evolution
 - d. Same origin
5. The embryological stages of _____ show similarity in anatomical features.
 - a. All living things
 - b. All non-vertebrates
 - c. All vertebrates
 - d. Human, jelly fish and mouse
6. Which enzyme is secreted in the active form?
 - a. Amylase
 - b. Lipase
 - c. Peptidase
 - d. Protease
7. Which hormone stimulates the secretion of gastric juice?
 - a. Cholecystokinin
 - b. Gastrin
 - c. Insulin
 - d. Secretin
8. In an inflammatory response, bradykinin causes?
 - a. Activation of natural killer cells
 - b. Blockage in blood vessels
 - c. Constriction of blood vessels
 - d. Leakage of fluid from blood vessels
9. Which of the following is an example of passive immunity?
 - a. Antibodies from mother's milk
 - b. Previous chickenpox infection
 - c. Inactivated polio vaccine
 - d. Live polio vaccine
10. Bacteria that lack flagella are called?
 - a. Amphitrichous
 - b. Atrichious
 - c. Lophotrichous
 - d. Peritrichous
11. Antibiotics can be used against:
 - a. Herpes simplex
 - b. Influenza
 - c. Polio
 - d. Salmonella typhi
12. The _____ in semen facilitate the transport of sperms.
 - a. Androgen
 - b. Prostaglandins
 - c. Oxytocin
 - d. Testosterone
13. The acidity of urine is neutralized by?
 - a. Cowpers gland
 - b. Prostate gland
 - c. Seminal vesicle
 - d. Vas deferens
14. The corpus luteum is essentially formed from
 - a. Graafian follicle
 - b. Ovum
 - c. Oogonium
 - d. Oocyte
15. The outer layer of uterus is called as:
 - a. Endometrium
 - b. Myometrium
 - c. Mesometrium
 - d. Perimetrium
16. _____ is spread through sexual contact.
 - a. Gonorrhoea
 - b. Influenza
 - c. Tuberculosis
 - d. Typhoid
17. The cells contained in the lacunae of the bone are called
 - a. Chondrocytes
 - b. Osteoblast
 - c. Osteocytes
 - d. Osteoclast
18. The _____ surrounds the muscle fibre of the skeletal muscle.
 - a. Cytoplasm
 - b. Lacunae
 - c. Myofibrils
 - d. Sarcoplasm
19. What happens to calcium when skeletal muscles recover from contraction?
 - a. Released from the sarcoplasmic reticulum
 - b. Released from the myosin head
 - c. Pumped into the sarcoplasmic reticulum
 - d. Exchanged for sodium ions
20. Which of the following blood groups has anti-A and anti-B antibodies in the serum?
 - a. A
 - b. AB
 - c. B
 - d. O
21. What is the primary outcome of crossing over during prophase I?
 - a. Chromosomes duplicate without any exchange of parts
 - b. Homologous chromosomes exchange different pairs leading to recombinant chromatids and increased genetic variation
 - c. Homologous chromosomes exchange identical parts, resulting in no genetic variation
 - d. Non-homologous chromosomes exchange parts
22. The genetic makeup that your parents have transferred to you for your hair color, makes up your:
 - a. Genotype
 - b. Karyotype
 - c. Phenotype
 - d. None of the above

23. Carnivorous plants have evolved mechanisms for trapping and digesting small animals. The product of this digestion is used to supplement the plant's supply of:
- Carbohydrates
 - Lipids
 - Nitrites
 - Water
24. Which is true for an X linked dominant trait?
- All female offspring of the affected father will be affected
 - Half of the female offsprings of the affected father will be affected
 - No male offspring of an affected mother will be affected
 - No female offspring of the affected father will be affected
25. Malpighian tubules are found in:
- Earthworm
 - Grasshopper
 - Leech
 - Slug
26. Shark belongs to class _____
- Chondrichthyes
 - Echinodermata
 - Osteichthyes
 - Urochordata
27. Canal system is a characteristic of?
- Cnidarians
 - Protozoans
 - Porifera
 - Segmented worms
28. Mantle is the feature of?
- Annelids
 - Chordates
 - Echinoderms
 - Mussel
29. The production of energy is _____.
- Faster in anaerobic respiration
 - Faster in aerobic respiration
 - Same in both types of respiration
 - Not associated with respiration
30. The pathway to the breakdown of glucose, carried out by micro-organisms, is called:
- Lactic acid fermentation
 - Alcoholic fermentation
 - Cellular respiration
 - None of the above
31. Chromosome is typically made up from a combination of?
- DNA and protein
 - DNA and RNA
 - RNA and lipids
 - RNA and proteins
32. Which cytoplasmic organelle make their own proteins?
- Chromosomes
 - Golgi apparatus
 - Mitochondria
 - Smooth endoplasmic reticulum
33. The active mass movement of mitochondria in the cytoplasm is due to
- Cyclosis
 - Endoplasmic streaming movements
 - Golgi apparatus
 - Transfer RNA
34. Which part of the brain is controlling your sense of balance?
- Amygdala
 - Cerebellum
 - Hippocampus
 - Medulla Oblongata
35. The neurotransmitter _____ is hydrolysed by monoamine oxidase
- Acetylcholine
 - Adrenaline
 - Glutamate
 - Serotonin
36. Most of the neurons in the CNS are?
- Bipolar
 - Multipolar
 - Pseudo unipolar
 - Unipolar
37. The enzymes enable the conversion of substrates into products by
- Changing equilibrium in the direction of the substrate
 - Increasing the activation energy
 - Increasing the substrate concentration
 - Lowering the activation energy
38. According to Lamarckism, the basis of evolution is:
- Inheritance of acquired characteristics
 - Mutation
 - Natural selection
 - Survival of the fittest
39. What best describes the hind leg bones seen in the whale?
- Analogous to the fin of living fish
 - Fossil structure from an extinct ancestor
 - Homologous structure of the wings of a bat
 - Vestigial structures that had a function in an ancestor
40. Which is true about the cells found in gastric glands lining the stomach wall?
- Chief cells secrete gastrin
 - Hormone cells secrete intrinsic factor
 - Mucus cells secrete mucin
 - Parietal cells secrete pepsinogen
41. What directly triggers the activation of natural killer cells?
- Free radicals
 - Hydrogen peroxide
 - Interferons
 - Oxygen
42. Which of the following is NOT true about plasmids found in streptococci?
- Carry fewer genes than the chromosome
 - Replicate autonomously from the chromosome
 - They are considered as genetic element
 - The bacterial chromosome depends on plasmids for replication
43. Which of the following bacteria produces endospores?
- Both gram negative and positive bacteria
 - Gram negative
 - Gram positive
 - Mycobacteria
44. _____ is used in the production of Humulin?
- Bacteria
 - Fungi
 - Protozoa

- d. Virus
45. Which of the following does NOT relate to smooth muscles?
- Controlled by the autonomic nervous system
 - Have spindle shaped cells
 - Line the wall of heart
 - Lack striations
46. Which term best describes an organism's physical characteristic.
- Allele
 - Genetic code
 - Genotype
 - Trait
47. What will happen with the addition of salt to water?
- Water potential will increase
 - Water potential will remain same
 - Osmotic potential will increase
 - Osmotic potential will remain same
48. Which of the following is NOT true about viruses?
- Contain DNA
 - Can replicate on their own
 - Can infect bacteria
 - They have a sub-cellular structure
49. The genetic code of _____ is bound by a lipid membrane?
- Enterovirus
 - Flu virus
 - Hepatitis A virus
 - Polio virus
50. Viruses can NOT _____.
- Crystallise
 - Excrete
 - Infect bacteria
 - Mutate
51. Where are the enzymes required for the replication of HIV virus located?
- In the protein spikes
 - Surrounding the viral core
 - Inside the capsid
 - Outside the capsid
52. The process of ATP synthesis through a combination of electrochemical and osmotic events is known as:
- Fermentation
 - Glycolysis
 - Oxidative phosphorylation
 - Oxidation of pyruvate to acetyl CoA
53. Optimum pH for pancreatic lipase is:
- 2
 - 4
 - 6
 - 8
54. Sugarcane contains _____.
- Fructose
 - Glucose
 - Ribose
 - Sucrose
55. Sick cell anaemia results from?
- Reduction in oxygen carrying capacity of haemoglobin
 - Linkage between the polypeptide chains
 - Single amino acid substitution in the haemoglobin molecule
 - Viral infections of RNA viruses
56. Which is INCORRECT about the globular proteins?
- Abundantly found in hair
 - Are spherical in shape
 - Have polypeptide chains
 - Soluble in water
57. What is the ester of fatty acids and long chain alcohol called?
- Acylglycerol
 - Glycerol
 - Phospholipid
 - Wax
58. Lipids, which do not contain fatty acid are:
- Neutral lipids
 - Phosphatidic acids
 - Steroids
 - Waxes
59. The peptidoglycan cell wall is specific to.
- Amoeba
 - Bacteria
 - Protozoa
 - Virus
60. Where are spindle fibres attached on a chromosome during cell division
- Centromere
 - Histone proteins
 - Nucleolus
 - Telomere
61. Which organelle contribute towards steroid production?
- Endoplasmic Reticulum
 - Golgi apparatus
 - Lysosome
 - Ribosomes
62. The lysosomes found in eukaryotes contain:
- Hydrolytic enzymes
 - Meiotic enzymes
 - Oxidative enzymes
 - Mitotic enzymes
63. Plasma membrane is differentially permeable membrane due to the presence of?
- Carbohydrates
 - Lipids
 - Proteins
 - Vitamins
64. The following function/activity is NOT controlled by the autonomic nervous system.
- Cardiac muscles contraction
 - Salivation
 - Smooth muscles contraction
 - Thoughts and emotions
65. A motor neuron:
- Carries impulse from effectors to CNS
 - Carries impulse from receptors to CNS
 - Carries impulse from CNS to muscles
 - Connects sensory nerves to ganglions
66. Diffusion of _____ across the post synaptic membrane causes it to depolarise:
- Calcium ions
 - Chloride ions
 - Potassium ions
 - Sodium ions
67. A reflex action, does not involve the
- Brain
 - Motor neuron
 - Sensory neuron
 - Spinal cord

68. What happens to the enzyme after an enzyme-catalysed reaction?
- Reduced to inactive form
 - Becomes inert
 - Changes into substrate
 - Used for another reaction

CHEMISTRY

69. In the production of SO_3 from SO_2 and Oxygen, the yield of SO_3 is increased by
- Adding a catalyst
 - Adding more SO_2
 - Increasing temperature
 - Removing oxygen

70. Consider $\text{N}_2 + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$ $\Delta H = -92.46 \text{ kJ/mol}$
The optimum temperature ($^\circ\text{C}$) to produce ammonia is
- 0
 - 450
 - 5000
 - Constant temperature

71. The unit of K_c for the system $\text{PCl}_5 \rightleftharpoons \text{PCl}_3 + \text{Cl}_2$ is
- dm^3/mol
 - mol/dm^3
 - mol/dm^6
 - mol^2/dm^6

72. For a first order reaction $\text{A} \rightarrow \text{B}$, the rate constant is 0.0458 s^{-1} . Calculate rate of the reaction if the concentration of reactant is 0.35 mol dm^{-3} .
- $0.012 \text{ mol dm}^{-3} \text{ s}^{-1}$
 - $0.014 \text{ mol dm}^{-3} \text{ s}^{-1}$
 - $0.016 \text{ mol dm}^{-3} \text{ s}^{-1}$
 - $0.018 \text{ mol dm}^{-3} \text{ s}^{-1}$

73. A reaction is first order with respect to A and second order with respect to B, the rate equation is
- Rate = $k[\text{A}]$
 - Rate = $k[\text{A}][\text{B}]$
 - Rate = $k[\text{A}]^2[\text{B}]$
 - Rate = $k[\text{A}][\text{B}]^2$

74. What mass of aluminium oxide (Al_2O_3) is produced from 18.5g of Al metal, when it reacts completely with oxygen gas according to the following equation?
 $4\text{Al}_{(\text{s})} + 3\text{O}_{2(\text{g})} \rightarrow 2\text{Al}_2\text{O}_{3(\text{s})}$
- 30.8g
 - 32.6g
 - 34.9g
 - 36.5g

75. Calculate the work done when 1 mole of an ideal gas expands from 15 dm^3 to 20 dm^3 against a constant external pressure of 2 atmospheres.
- $-10 \text{ atm}\cdot\text{dm}^3$
 - $-5 \text{ atm}\cdot\text{dm}^3$
 - $5 \text{ atm}\cdot\text{dm}^3$
 - $10 \text{ atm}\cdot\text{dm}^3$

76. When 1 mole of ice melts at 0°C and constant pressure of 1 atmosphere, 6025 J of heat is absorbed by the system. The molar volume of ice and water are 0.020 and 0.018 dm^3 , respectively. Calculate ΔE .
($1 \text{ dm}^3 \cdot \text{atm} = 101.33 \text{ J}$)
- 6010.20J
 - 6015.20J
 - 6020.20J
 - 6025.20J

77. One slice of bread with a tablespoon of peanut butter on it contains 20g carbohydrate, 10g protein, and 9g fat. Calculate total energy consumed in this intake.
- 158kcal
 - 173kcal
 - 201kcal
 - 218kcal

78. ΔH can be measured indirectly by applying
- Avogadro's law
 - Faraday's law
 - Gas's law
 - Hess's law

79. The heat of sublimation of potassium is 98 kJ/mol , the heat of dissociation of bromine gas is 192.5 kJ/mol . The ionization energy of K is 414 kJ/mol . The electron affinity of Br is -334.7 kJ/mol and the heat of formation of KBr is -405.8 kJ/mol . Calculate the lattice energy of KBr.

- 679.3
- 669.5
- 669.5
- 679.3

80. Which one of the following is a strong electrolyte in solution?
- Acetic acid
 - Ammonium hydroxide
 - Carbonic acid
 - Potassium iodide

81. When 4 g of magnesium was heated in excess of oxygen. Calculate the theoretical yield of magnesium oxide (MgO).
- 3.7g
 - 4.2g
 - 5.4g
 - 6.6g

82. The electrode potential of the standard hydrogen electrode is chosen as
- 1 V
 - 0 V
 - 1 V
 - 2 V

83. Electronegativity of Al is approximately equal to that of
- B
 - Be
 - Mg
 - Na

84. Which of the following alkali metal forms only normal oxide with O_2 ?
- K
 - Li
 - Na
 - Rb

85. Third period element that initially reacts rapidly with oxygen to form a protective oxide coating that prevents further reactions is
- Al
 - Mg
 - Na
 - Si

86. Cu^{2+} salt solution is blue in colour due to transition of electrons from
- d to d orbital
 - p to d orbital
 - p to p orbital

- d. s to p orbital
87. Potassium ferrocyanide is which type of salt?
- Complex
 - Double
 - Mixed
 - Normal
88. Name of ketone functional group is
- Amino
 - Carbonyl
 - Carboxyl
 - Formyl
89. Pyridine belongs to which class of organic compounds?
- Alicyclic
 - Heterocyclic
 - Homocyclic
 - Hydrocarbon
90. Which of the following elements cannot be detected directly in a given organic compound?
- Chlorine
 - Nitrogen
 - Oxygen
 - Phosphorous
91. The homolytic fission of C-H bond in an alkane result in
- Alkyl free radical
 - Carbanion
 - Carbocation
 - Methylpropane
92. Addition of HBr to isobutylene mainly gives
- isobutyl bromide
 - n-butyl bromide
 - sec-butyl bromide
 - tert-butyl bromide
93. Dehydrohalogenation of alkylhalide is carried out in presence of
- Alcoholic KOH
 - Aqueous KOH
 - Conc. H_2SO_4
 - Zn dust
94. The pK_b of n-propyl amine is
- 3.24
 - 3.28
 - 3.32
 - 3.35
95. The carbon atom carrying positive charge and attached to three other atoms or groups is called
- Carbanion
 - Carbene
 - Carbocation
 - Oxonium
96. Which of the following has the highest boiling point?
- ethyl alcohol
 - isopropyl alcohol
 - n-propyl alcohol
 - tert-butyl alcohol
97. The reaction of an alcohol with sodium produces
- Aldehyde
 - Alkoxide
 - Ethane
 - Ethene
98. Oxidation of secondary alcohol gives
- Carboxylic acid
 - Ether
 - Ketone
 - Phenol
99. Which aldehyde is more reactive towards nucleophilic addition?
- Acetaldehyde
 - Butyraldehyde
 - Formaldehyde
 - Propionaldehyde
100. Acetic acid can be prepared by the hydrolysis of
- Ethanal
 - Ethanol
 - Methanoic acid
 - Methyl cyanide
101. Protein present in haemoglobin has _____ structure.
- Primary
 - Secondary
 - Tertiary
 - Quaternary
102. In competitive inhibition, the inhibitor
- Binds with substrate
 - Competes with enzyme
 - Competes with substrate
 - Irreversibly binds with enzyme
103. How many moles are there in 60g of sodium hydroxide (NaOH)?
- 2
 - 4
 - 6
 - 8
104. Heating 24.8g of copper carbonate ($CuCO_3$) in a crucible produced only 13.9g of copper oxide (CuO). What is the percentage yield of copper oxide?
- 81.79%
 - 83.98%
 - 86.87%
 - 89.68%
105. Efficiency of chemical reaction can be checked by calculating
- Actual yield
 - Theoretical yield
 - Percentage yield
 - Amount of the reactant unused
106. Actual yield will reach the ideal (theoretical) value if the % yield of the reaction is,
- 10%
 - 50%
 - 90%
 - 100%
107. Which of the following sub-shell does not exist?
- 1p
 - 1s
 - 5d
 - 6f
108. The splitting of spectral lines in magnetic field is
- Aufbau principle
 - Pauli exclusion principle
 - Stark effect
 - Zeeman effect
109. Which element has the electronic configuration of noble-gas notation $[Kr], 5s^2, 4d^2$
- Mo
 - Se
 - Sr
 - Zr

110. Total number of electron pairs present in the valence shell of central atom in water are
- 2
 - 3
 - 4
 - 5
111. What is the mass of 1 mole of calcium carbonate (CaCO_3)?
- 50g
 - 75g
 - 100g
 - 125g
112. Which one of the following molecules has a pyramidal structure?
- C_2H_4
 - CH_4
 - H_2O
 - NH_3
113. Which one of the following molecules has a zero-dipole moment?
- BF_3
 - NF_3
 - NH_3
 - H_2O
114. The unhybridized p orbital in sp^2 hybridization is
- In the same plane
 - Out of the plane
 - Parallel to sp^2 orbitals
 - Perpendicular to sp^2 orbitals
115. 760 torr is equal to ____ Pascal
- 1
 - 76
 - 760
 - 101325
116. How many grams of CO_2 can be produced by thermally decomposing 10 moles of $\text{ZnCO}_3(s)$?
- 320
 - 360
 - 400
 - 440
117. Molar heat of vaporization of water is
- 40.7 cal/mol
 - 40.7 J/mol
 - 40.7 kcal/mol
 - 40.7 kJ/mol
118. Distillation under very reduced pressure is ____ distillation
- Destructive
 - Fractional
 - Steam
 - Vacuum
119. The example of metallic solid is
- B
 - C
 - Cu
 - Si
120. When a crystalline substance conducts current in one direction but not through other directions of the crystal, this property is
- Allotropy
 - Anisotropy
 - Isomorphism
 - Polymorphism
121. Forward reaction is the one that
- Is very slow at the beginning of the reaction
 - Reacts to form reactants
 - Speeds up gradually and at equilibrium its rate becomes constant
 - Takes place from left to right as given in chemical equation
122. How many moles of NaCl are produced from 16.5g of HCl, according to the neutralization reaction?
- $$\text{HCl}_{(aq)} + \text{NaOH}_{(aq)} \rightarrow \text{NaCl}_{(aq)} + \text{H}_2\text{O}_{(l)}$$
- 0.252
 - 0.452
 - 0.652
 - 0.852

PHYSICS

123. In an adiabatic process, how does the temperature of a gas change as its volume decreases?
- The temperature decreases
 - The temperature increases
 - The temperature remains constant
 - The temperature first increases then decreases
124. During an isothermal expansion of an ideal gas, which of the following statement is true?
- Pressure and temperature of the gas increase
 - The internal energy of the gas increases
 - The temperature of the gas remains constant
 - The work done by the gas is zero
125. Consider an ideal gas confined to the cylinder with a fixed piston, on heating the gas, all the heat supplied increases _____.
- Kinetic energy of the molecules
 - Potential Energy of the molecules
 - The intermolecular forces between gas molecules
 - The number of gas molecules
126. What is the increase in force between two charges if the separation between them is decreased by 50 percent?
- Becomes four times
 - Doubles
 - Increases by half
 - Triples
127. According to Coulomb's law, what happens to the electrostatic force between the 2-point charges if the distance between them is doubled?
- The force becomes one-fourth
 - The force becomes half
 - The force doubles
 - The force remains the same
128. What does one Coulomb represent in terms of charge?
- The amount of charge transported by a current of one Ampere in one second
 - The charge of one proton
 - The charge of one electron
 - The charge required to create a force of 1 Newton between two charges separated by 1meter
129. Two points charges, $+5\mu\text{C}$ and $-5\mu\text{C}$ are placed at points A and B, respectively, which are separated by a distance $2d$. What is the electric potential at the midpoint M of the line joining A and B?
- $2kQ/d$
 - kQ/d

- c. $-kQ/d$
d. zero
130. In the case of a parallel plate capacitor, when the distance between the two plates is reduced to half and the area of the plate doubled, the capacitance
- Increases four times
 - Increases six times
 - Is doubled
 - Remains the same
131. If the dielectric material between the plates of the capacitor is removed, what happens to the electric field between the plates?
- The electric field becomes zero
 - The electric field decreases
 - The electric field increases
 - The electric field remains the same
132. Capacitance of a capacitor increases with a decrease in:
- Dielectric constant
 - Plate area
 - Permittivity
 - Plate separation
133. The I-V Graph for a non-Ohmic material is always
- Curved
 - Horizontal
 - Linear
 - Perpendicular
134. Temperature coefficient of resistance is defined as increase in resistance per ohm original resistance per ___?
- Degree rise in temperature
 - Unit increase in electric current
 - Unit decrease in capacitance
 - Degree drop in temperature
135. For metals, the temperature coefficient of resistance is:
- Infinity
 - Negative
 - Positive
 - Zero
136. If R_1 and R_2 are respectively the filament resistance of a 100-Watt bulb and 200-Watt bulb designed to operate on the same voltage, then power of:
- R_1 is two times R_2
 - R_2 is two times R_1
 - R_2 is four times R_1
 - R_1 is four times R_2
137. The maximum power transfer theorem states that maximum power is delivered to the load when
- The load resistance is half of the source resistance
 - The load resistance is zero
 - The load resistance is double the source resistance
 - The load resistance is equal to the source resistance
138. Electron Volt (eV) is another unit of
- Charge
 - Current
 - Energy
 - Power
139. An electron is moving perpendicular to the magnetic field, which of the following is correct statement about electromagnetic force acting on the electron?
- Force acting is equal to electron charge
 - Force acting is equal to the magnetic field strength
 - Force acting is maximum
 - Zero force is acting on it
140. For a positive charged particle (q) moving with a velocity (v) in a magnetic field of flux density B , the force (F) acting on the charge particle is given by the expression?
- $q = Fv \times B$
 - $F = qv \times B$
 - $F = v \times B/q$
 - $q = v \times B/F$
141. Which of the following statement is true about the magnetic field inside a solenoid?
- It is along the axis of the coil
 - It is circular around the wires
 - It is strongest at the ends of the solenoid
 - It is zero when current flows through it
142. One-meter-long copper rod is moving with speed 20 m/sec in the magnetic field of strength 0.6 tesla what is the value of induced emf?
- 12 V
 - 19.4 V
 - 20.6 V
 - 25 V
143. The inductance of a coil depends on.
- Number of turns
 - Resistance of the wire used
 - Type of insulation used on the wire
 - Voltage applied to the coil
144. The direction of induced current is determined by?
- Ampere's law
 - Faraday's law
 - Lenz's law
 - Ohm's law
145. Lenz's law is consistent with the
- Ampere's Law
 - Faraday's law
 - Law of conservation of energy
 - Ohm's Law
146. The basic principle behind the operation of the transformer is.
- Coulomb's law
 - Electromagnetic induction
 - Gas's Law
 - Hess's law
147. When the PN junction is reverse-biased, its reverse current is of the order of:
- Gigaamperes
 - Kiloamperes
 - Megaamperes
 - Microamperes
148. The momentum of moving photon is:
- mc^2
 - λ / h
 - h / λ
 - zero
149. In every instant of time, wavelength associated with a freely falling body:
- Decreases
 - Increases two times

- c. Increases four times
d. Remains constant
150. As per 2nd photoelectric experiment, photoelectric effect does not occur if the frequency of the incident light is?
a. Below the threshold frequency
b. Equals the threshold frequency
c. Three times the threshold frequency
d. Twice the threshold frequency
151. If an electron in the hydrogen atom jumps from second to first orbit, the emitted radiation has a wavelength of?
a. $4/3RH$
b. $3/4RH$
c. RH
d. $4RH$
152. Black body is an ideal radiator that radiates _____ at all wavelengths
a. Inconsistently
b. Distinctly
c. Equally
d. Unequally
153. Mass number A refers to _____
a. Number of electrons
b. Number of nucleons
c. Number of neutrons
d. Number of protons
154. λ is a _____ constant:
a. Decay
b. Dielectric
c. Plank's
d. Proportionality
155. Gamma ray camera can observe radiations from the _____ that are concentrated in the organs
a. Atoms
b. Isotopes
c. Nucleons
d. Neutrons
156. A car is moving in a circular path at a constant speed. What provides the necessary centripetal force to keep the car moving in this path?
a. The car's inertia resisting any change in direction
b. The car's mass pulling it towards the centre of the circle
c. The engine's power pushing the car forward
d. The friction between the tyres and the road
157. Which of the following pairs correctly matches a physical quantity with its SI unit?
a. Energy- Newton
b. Force - Joule
c. Power- Watt
d. Velocity- m/s^2
158. _____ is the natural tendency of an object to remain at rest or in motion with constant velocity?
a. Friction
b. Inertia
c. Mass
d. Weight
159. A car in motion hits and gets crashed into a tree trunk, what is NOT conserved?
a. Kinetic energy alone
b. Momentum alone
c. Momentum and kinetic energy both
d. Neither kinetic energy nor momentum
160. The vertical and horizontal component of the projectile motion are
a. Correlated with each other
b. Dependent on each other
c. Independent of each other
d. Associated with each other
161. A ball is kicked horizontally from the top of a 10m high cliff with an initial speed of 15m/s. After 2 seconds, which of the following statement describes the ball's horizontal and vertical components?
a. The horizontal velocity is 15m/s while vertical velocity is 20m/s downwards
b. The horizontal velocity is 15m/s while vertical velocity is 15m/s downwards
c. The horizontal velocity is 30m/s while vertical velocity is 20m/s downwards
d. The horizontal velocity is 15m/s while vertical velocity is 0m/s
162. How does an angle between the force applied and the direction of motion influence the work done on an object?
a. Work is constant regardless of the angle
b. Work is maximum when the angle is 0°
c. Work is negative when the angle is 90°
d. Work is 0 when the angle is 45°
163. A nurse is pushing a wheelchair with an 80kg patient sitting on it. How much work is done by the patient's weight?
a. Half of the work
b. Maximum work
c. Minimum work
d. No work
164. If a constant force of 10N is applied to move an object 5m in the direction of the force, what is the work done?
a. 2 J
b. 5 J
c. 15 J
d. 50 J
165. The escape velocity of a body in the gravitational field of Earth is dependent on:
a. Angle on which it is thrown
b. Both mass of the body and the angle at which it is thrown
c. Mass of earth
d. Mass of the body
166. A wheel makes 3 complete revolutions. What is the total number of radians through which a point on wheel has rotated?
a. 2π
b. 3π
c. 6π
d. 9π
167. For rigid body that rotates about a fixed axis, the angle swept out by a line passing through any point on the body and intersecting the axis of rotation perpendicularly is called?
a. Angular acceleration
b. Angular displacement
c. Angular momentum
d. Angular velocity
168. In a rotating spaceship, to produce artificial gravity, what does the centripetal force do?

- a. Has no effect inside the spaceship
b. Increases spaceship's rotation
c. Pulls objects towards the centre
d. Pushes the objects towards the outer wall
169. When the mass of a body moving along a circle becomes half and radius becomes double, and v is constant, the centripetal force becomes?
a. Double
b. Half
c. One-fourth
d. Remains Same
170. What happens when two waves of the same frequency and amplitude meet in phase?
a. They cancel each other out resulting in a destructive interference
b. They combine to form a wave double the amplitude, resulting in constructive interference
c. They produce a wave with zero amplitude
d. They produce a wave with the same amplitude as the individual waves
171. Which type of waves can be polarized?
a. Longitudinal waves
b. Mechanical waves
c. Sound waves
d. Transverse waves
172. For longitudinal waves _____
a. The particles of the medium oscillate perpendicular to the wave's propagation
b. The particles of the medium remain stationary as the wave passes through
c. The particles of the medium oscillate along the direction of the wave's propagation
d. Their velocity is enhanced when they travel through vacuum
173. According to the principle of superimposition, when 2 or more waves overlap at a point in space, the amplitude of the resultant wave at that point is
a. Always zero
b. The product of the individual wave amplitude
c. The product of the frequencies of the individual waves
d. The sum of the amplitudes of the individual waves
174. The speed of sound in a medium containing ideal gas is NOT dependent on
a. Density
b. Moisture
c. Pressure
d. Temperature
175. A tuning fork having angular frequency equal 440Hz produces sound waves which travel with the speed of 340 m/s. What is the separation between a compression and the adjacent rarefaction of the sound waves?
a. 0.57 m
b. 0.67 m
c. 0.77 m
d. 0.87 m
176. A police car, with its siren on, is moving towards a stationary listener. How does the stationary listener receive the frequency of the sound emitted by the siren? It
a. Decreases
b. Increases

- c. Stays the same
d. Varies randomly

ENGLISH

177. Punctuate the given sentence correctly. The teacher asked did you complete your homework
a. The teacher asked, did you complete your homework?
b. The teacher asked, "Did you complete your homework?"
c. The teacher asked, "did you complete your homework".
d. The teacher asked, did you complete your homework.
178. Punctuate the following sentence correctly. Lets meet at Sarahs house after school
a. Let's meet at Sarah's house after school.
b. Let's meet at Sarahs' house after school.
c. Lets meet at Sarah's house after school.
d. Let's meet, at Sarah's house after school.
179. Do you usually take a bus.....the market?
a. By
b. For
c. Of
d. To
180. He has been working _____ this project for two weeks.
a. At
b. By
c. To
d. On
181. Identify the sentence that contains an ERROR in word order, style, or vocabulary:
a. He has a talent for solving complex problems.
b. She enjoys reading, writing, and to paint.
c. The quick brown fox jumps over the lazy dog.
d. They quickly adapted to the new environment.
182. Identify the ERROR in the sentence: The chef quickly prepared, delicious and it served a meal.
a. Punctuation
b. Style
c. Vocabulary
d. Word order
183. Order is the law of civilization as chaos is the law of the _____. The most appropriate word to be filled in is:
a. City
b. Metropolis
c. Physician
d. Wilderness
184. Blueprint is to architect as algorithm is to _____
a. Designer
b. Engineer
c. Mathematician
d. Programmer
185. "Regular exercise has been shown to improve overall health by reducing the risk of chronic diseases, such as heart disease and diabetes. Additionally, exercise enhances mental well-being by reducing stress, anxiety, and depression. Despite these benefits, many people find it challenging to maintain a consistent exercise routine due to busy schedules and a lack of motivation."

Based on the paragraph, which of the following statements can be inferred?

- a. Busy schedules and lack of motivation are barriers to regular exercise.
 - b. Chronic diseases cannot be prevented by regular exercise.
 - c. Exercise is only beneficial for physical health, not mental health.
 - d. People who exercise regularly never experience stress or anxiety.
186. Which of the following words is a synonym for "meticulous"?
- a. Abhorrent
 - b. Heedless
 - c. Incautious
 - d. Precise
187. A person who sells goods and services is a _____
- a. Consumer
 - b. Purchaser
 - c. Patron
 - d. Vendor
188. The detective noticed a subtle change in the suspect's tone when he asked about her whereabouts on the night of the crime, which hinted at something more significant. What does "subtle" most likely mean?
- a. Dramatic
 - b. Notable
 - c. Obvious
 - d. Slight
189. Despite the complicated situation, she remained _____, calmly assessing her options before deciding. Fill in the blank with the appropriate choice:
- a. Composed
 - b. Erratic
 - c. Frantic
 - d. Hysterical
190. Find out synonym of "Elated"
- a. Confused
 - b. Disappointed
 - c. Nervous
 - d. Overjoyed
191. Choose the sentence with the correct tense and sentence structure:
- a. He is going to the market yesterday.
 - b. I had been waiting for the bus, and it arrives.
 - c. She will finish her homework before she went to bed.
 - d. They were playing football when it started to rain.
192. Choose the correct sentence.
- a. My father was talking to his friend on mobile phone when I fall from the bicycle.
 - b. My father is talking to his friend on mobile phone when I fall from the bicycle.
 - c. My father was talking to his friend on mobile phone when I fell from the bicycle.
 - d. My father was talking to his friend on mobile phone when I am falling from the bicycle.
193. Choose the correct sentence:
- a. She didn't knew about the surprise party.
 - b. She hasn't knew about the surprise party.
 - c. She didn't know about the surprise party.
 - d. She doesn't knew about the surprise party.

194. After she _____ the stairs, her heart almost gave out from exhaustion.
- a. Has climbed
 - b. Have climbed
 - c. Had climbed
 - d. Was climbing

LOGICAL REASONING

195. A store offers a 10% discount on all items. After applying the discount, the price of an item is Rs. 450. What was the original price of the item?
- a. Rs. 490
 - b. Rs. 495
 - c. Rs. 500
 - d. Rs. 505
196. I went 10 m to the East from my house, then turned north and walked another 15m, and then I turned west and covered 12 m, and then turned south and covered 15m. How far am I from my house?
- a. 0 m
 - b. 1 m
 - c. 2 m
 - d. 3 m
197. If $a > b$, $b > c$, and $d > a$ then?
- a. $b < d$
 - b. $a < c$
 - c. $b > d$
 - d. $c > d$
198. Find out the missing term in the sequence: 15, 14, 12, 9?
- a. 5
 - b. 6
 - c. 7
 - d. 8
199. All omnivores are herbivores. No herbivores are carnivores. Some carnivores are humans. Which of the following conclusions are TRUE?
CONCLUSIONS: I. Some humans are carnivores. II. No carnivores are omnivores. III. Some omnivores are carnivores.
- a. I and II
 - b. I and III
 - c. II and III
 - d. III
200. Read the following statements and identify the best cause-and-effect relation:
- i. Sara's productivity at work has significantly decreased over the past month.
 - ii. Sara has been experiencing frequent interruptions due to ongoing construction work near her office.
- Which of the following best describes the cause-and-effect relationship?
- a. Sara's decreased productivity is causing the construction work.
 - b. The ongoing construction work is causing Sara's decreased productivity.
 - c. Sara's productivity was already decreasing before the construction work began.
 - d. The construction work is unrelated to Sara's productivity.