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HSSC-I NATIONAL BOOK FOUNDATION FBISE

BIOLOGY TEST - CHAPTER 2: BIOLOGICAL MOLECULES

Name:		Roll No.		Section:	

Total Time: 2:30 Hour
Time Allowed: 150 Minutes

Total Marks: 150

PAPER OBJECTIVE
SECTION-A (MARKS 150)

NOTE: Section-A is compulsory. All parts of this section are to be answered on these pages and handed over to the center superintendent. Deleting / overwriting is not allowed. Do not use lead pencil.

Q.1 Fill the relevant bubble for each part. All parts carry one mark.

Questions	A	B	C	D	A B C D
1. The study of chemical compounds and processes in living organisms is called:	biochemistry	physiology	taxonomy	ecology	● ○ ○ ○
2. The most prevalent type of chemical bond in biological molecules is the:	ionic bond	metallic bond	covalent bond	hydrogen bond	○ ○ ● ○
3. In an ionic bond, atoms are held together by:	electrostatic attraction between ions	van der Waals forces only	sharing of electrons	hydrogen atoms only	● ○ ○ ○
4. A hydrogen bond forms between a hydrogen atom and a lone pair on:	a carbon atom	an electronegative atom	a noble gas	a metal atom	○ ● ○ ○
5. How many hydrogen bonds are there between guanine and cytosine?	Two	Four	Three	One	○ ○ ● ○
6. How many hydrogen bonds are there between adenine and thymine?	One	Three	Two	Four	○ ○ ● ○
7. The word hydrophobic means:	water splitting	water soluble	afraid of water	water loving	○ ○ ● ○
8. Out of 92 natural elements, about how many are found in living organisms?	92	50	6	25	○ ○ ○ ●
9. How many bioelements make up about 99% of protoplasm?	Two	Six	Twenty-five	Sixteen	○ ● ○ ○
10. The living mass of the cell is called:	protoplasm	chromatin	cytosol	stroma	● ○ ○ ○
11. Which are the four fundamental biological molecules?	Proteins, vitamins, minerals, fats	Sugars, salts, DNA, ions	Carbohydrates, proteins, lipids, nucleic acids	Water, salts, vitamins, minerals	○ ○ ● ○
12. A large molecule made of repeating units is a:	isomer	monomer	dimer	polymer	○ ○ ○ ●

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Questions	A	B	C	D	A B C D
13. Condensation is also called:	hydration	hydrolysis	ionization	dehydration synthesis	○ ○ ○ ●
14. In condensation reaction, the molecule released is:	water	hydrogen	oxygen	carbon dioxide	● ○ ○ ○
15. When 20 monomers condense into a polymer, the number of water molecules released is:	20	21	10	19	○ ○ ○ ●
16. All digestion reactions are examples of:	condensation	oxidation	dehydration	hydrolysis	○ ○ ○ ●
17. Water is polar because the O-H electrons are:	shared equally	absent	shared unequally	transferred completely	○ ○ ● ○
18. The weak bond between water molecules is the:	hydrogen bond	glycosidic bond	ionic bond	peptide bond	● ○ ○ ○
19. Attraction between water molecules is called:	ionization	adhesion	cohesion	hydration	○ ○ ● ○
20. Attraction of water to polar surfaces is called:	adhesion	evaporation	cohesion	polarity	● ○ ○ ○
21. The heat of vaporization of water is about:	1 calorie per gram	100 calories per gram	574 calories per gram	10 calories per gram	○ ○ ● ○
22. One calorie raises the temperature of 1 g of water by:	10 °C	1 °C	0.1 °C	100 °C	○ ● ○ ○
23. Ice floats because ice is:	denser than water	colder than water	less dense than water	made of ions	○ ○ ● ○
24. Ionization of water releases:	H+ and OH- ions	only OH- ions	H3 and O	H2 and O2	● ○ ○ ○
25. The general formula of carbohydrates is:	CnO2n	Cn(H2O)n	CnH2n	CnHn	○ ● ○ ○
26. The molecular formula of glucose is:	C5H10O5	C12H22O11	C3H6O3	C6H12O6	○ ○ ○ ●
27. Carbohydrates with more than ten saccharide units are:	monosaccharides	disaccharides	oligosaccharides	polysaccharides	○ ○ ○ ●
28. Monosaccharides with an aldehyde group are called:	ketoses	pentoses	aldoses	trioses	○ ○ ● ○
29. The sugar present in DNA is:	fructose	glucose	ribose	deoxyribose	○ ○ ○ ●
30. Which monosaccharide is a component of milk sugar?	Galactose	Erythrose	Ribose	Fructose	● ○ ○ ○
31. A five-membered ring with one oxygen is called:	ketose	pyranose	aldose	furanose	○ ○ ○ ●

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Questions	A	B	C	D	A B C D
32. The ring form of glucose in water is:	ribofuranose	glucopyranose	fructopyranose	glycerose	○ ● ○ ○
33. Glucose and fructose are:	functional group isomers	enantiomers	anomers	epimers	● ○ ○ ○
34. The number of stereoisomers of glucose is:	4	32	8	16	○ ○ ○ ●
35. Stereoisomers differing at C-1 only are:	epimers	anomers	diastereoisomers	enantiomers	○ ● ○ ○
36. D-glucose and D-mannose are:	epimers	enantiomers	anomers	functional isomers	● ○ ○ ○
37. Sucrose is also called:	malt sugar	milk sugar	fruit sugar	cane sugar	○ ○ ○ ●
38. Lactose is formed by condensation of:	α-glucose and β-fructose	β-galactose and β-glucose	two β-fructose	two α-glucose	○ ● ○ ○
39. Maltose is joined by which glycosidic linkage?	β-1,4	α-1,2	α-1,6	α-1,4	○ ○ ○ ●
40. Which disaccharide is the main transport sugar in plants?	Maltose	Sucrose	Cellulose	Lactose	○ ● ○ ○
41. Starch gives which colour with iodine?	Blue-black	Yellow	No colour	Red	● ○ ○ ○
42. Glycogen gives which colour with iodine?	No colour	Red	Blue-black	Green	○ ● ○ ○
43. The storage carbohydrate of animals is:	glycogen	starch	cellulose	chitin	● ○ ○ ○
44. The most abundant carbohydrate on earth is:	starch	glycogen	cellulose	chitin	○ ○ ● ○
45. Chitin occurs in:	animal muscles	plant cell walls	fungal cell walls	bacterial cell walls	○ ○ ● ○
46. The branching linkage in amylopectin is:	α-1,2	β-1,4	α-1,6	α-1,4	○ ○ ● ○
47. Benedict's test gives which result for glucose?	Violet colour	Green, yellow or red precipitate	Purple ring	Blue-black colour	○ ● ○ ○
48. Molisch's test positive result is a:	blue colour	purple ring	green ring	red precipitate	○ ● ○ ○
49. The bond between two amino acids is the:	ester bond	phosphodiester bond	peptide bond	glycosidic bond	○ ○ ● ○
50. How many amino acids are commonly found in proteins?	100	11	9	20	○ ○ ○ ●

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Questions	A	B	C	D	A B C D
51. How many essential amino acids are there in the diet?	Six	Eleven	Nine	Twenty	○ ○ ● ○
52. The simplest amino acids are:	lysine and valine	proline and histidine	glycine and alanine	serine and leucine	○ ○ ● ○
53. The primary structure of a protein is its:	α-helix	globular fold	quaternary form	amino acid sequence	○ ○ ○ ●
54. The α-helix and β-pleated sheet are held by:	peptide bonds only	phosphodiester bonds	glycosidic bonds	hydrogen bonds	○ ○ ○ ●
55. Which of these is a fibrous protein?	Haemoglobin	Enzyme	Antibody	Keratin	○ ○ ○ ●
56. Which of these is a globular protein?	Myosin	Collagen	Antibody	Keratin	○ ○ ● ○
57. Biuret test gives which colour for proteins?	Green	Blue-black	Red ring	Pink or violet	○ ○ ○ ●
58. Lipids are soluble in:	dilute acid	salt solution	organic solvents	water	○ ○ ● ○
59. Triacylglycerols are called neutral lipids because:	all glycerol OH groups are occupied	they are acids	they have phosphate	they have no carbon	● ○ ○ ○
60. Glycerol is a:	trihydroxy alcohol	amino acid	dihydroxy acid	fatty acid	● ○ ○ ○
61. Saturated fatty acids are generally:	solid at room temperature	gases	absent in animals	liquid at room temperature	● ○ ○ ○
62. Which is an unsaturated fatty acid?	Stearic acid	Palmitic acid	Oleic acid	Myristic acid	○ ○ ● ○
63. The most common phospholipid is:	cholesterol	beeswax	lecithin	tristearin	○ ○ ● ○
64. Beeswax is an example of a:	terpene	natural wax	phospholipid	steroid	○ ● ○ ○
65. The building block of terpenes is the:	glycerol	amino acid	isoprene unit	fatty acid	○ ○ ● ○
66. Prostaglandins are derived from:	arachidonic acid	oleic acid	stearic acid	palmitic acid	● ○ ○ ○
67. The Sudan III test for lipids gives a:	blue-black colour	dark red layer	violet colour	purple ring	○ ● ○ ○
68. Which are the purine bases?	Cytosine and uracil	Adenine and guanine	Cytosine and thymine	Thymine and uracil	○ ● ○ ○
69. A nucleoside is a base joined to:	pentose sugar	phosphate only	fatty acid	amino acid	● ○ ○ ○

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Questions	A	B	C	D	A B C D
70. Phosphodiester bond formation releases:	water	carbon dioxide	pyrophosphate	oxygen	○ ○ ● ○
71. ATP is a:	mononucleotide	dinucleotide	polypeptide	steroid	● ○ ○ ○
72. NAD is a:	protein	mononucleotide	lipid	dinucleotide	○ ○ ○ ●
73. The width of the DNA double helix is:	20 nm	2 nm	10 nm	3.4 nm	○ ● ○ ○
74. One turn of the DNA helix contains how many base pairs?	5	10	20	3	○ ● ○ ○
75. A protein chain of 50 amino acids is made by condensation. The number of water molecules released is:	49	51	50	25	● ○ ○ ○
76. A polysaccharide is formed from 101 glucose units by condensation. Water molecules released:	50	100	101	102	○ ● ○ ○
77. A dipeptide is broken by adding water. This reaction is:	condensation	hydrolysis	polymerization	dehydration	○ ● ○ ○
78. Amylase breaks starch to maltose by adding water. This is an example of:	esterification	hydrolysis	condensation	oxidation	○ ● ○ ○
79. Two alpha-glucose molecules join and one water molecule is removed. The product is:	sucrose	cellulose	lactose	maltose	○ ○ ○ ●
80. A sailor finds that sweat cools his skin. This is due to water's high:	heat of vaporization	ionization	density	molecular weight	● ○ ○ ○
81. Evaporation of 2 ml out of 1 litre of water lowers the temperature of the remaining water by:	2 °C	0.1 °C	10 °C	1 °C	○ ○ ○ ●
82. A lake freezes from the top, and fish survive below the ice. This is due to the:	ionization of water	adhesion of water	lower density of ice	high polarity of water	○ ○ ● ○
83. Water moves up a narrow tube because of cohesion and adhesion. Both are due to:	peptide bonds	ionic bonds	hydrogen bonds	covalent bonds	○ ○ ● ○
84. A drop of oil in water joins into one large drop. This shows:	hydrophobic exclusion	ionization	polarity	cohesion	● ○ ○ ○
85. Ionic compounds dissolve easily in water because water is:	a nonpolar molecule	an ionic compound	a gas	a polar molecule	○ ○ ○ ●

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Questions	A	B	C	D	A B C D
86. A hot desert organism stays cool because water absorbs much heat with little temperature rise. This is water's:	low density	high specific heat	adhesion	ionization	○ ● ○ ○
87. A cell biologist finds that phospholipids form a bilayer with tails facing inward. This is due to:	ionic bonds	peptide bonds	hydrophobic interactions	covalent attraction only	○ ○ ● ○
88. A jellyfish is transparent because it contains about:	70% protein	99% water	20% water	50% water	○ ● ○ ○
89. A compound has the formula C3H6O3 and is not a carbohydrate. It is:	lactic acid	ribose	glucose	fructose	● ○ ○ ○
90. A compound with formula C6H12O5 is a carbohydrate. It is:	glycerol	lactic acid	rhamnose	acetic acid	○ ○ ● ○
91. A student identifies a sugar that is used in respiration as an initial substrate. It is:	galactose	glucose	erythrose	ribose	○ ● ○ ○
92. A monosaccharide has 4 asymmetric carbons. The number of its stereoisomers is:	4	16	32	8	○ ● ○ ○
93. An α-glucose has its -OH on C-1 pointing:	upward	absent	sideways	downward	○ ○ ○ ●
94. Left-handed laboratory sweeteners cannot be digested by human enzymes because the enzymes:	are left-handed	are inactive	are right-handed	are dissolved	○ ○ ● ○
95. A student hydrolyses sucrose. The products are:	two fructose	α-glucose and β-fructose	glucose and galactose	two glucose	○ ● ○ ○
96. A baby drinks milk. The main disaccharide supplying energy is:	sucrose	cellulose	lactose	maltose	○ ○ ● ○
97. Barley starch is broken by amylase in a brewery to produce:	lactose	cellulose	sucrose	maltose	○ ○ ○ ●
98. Sprouting potatoes taste sweet because they contain:	lactose	maltose	chitin	cellulose	○ ● ○ ○
99. A test tube with iodine turns dark blue-black. The sample contains:	glucose	starch	glycogen	cellulose	○ ● ○ ○
100. A liver sample gives red colour with iodine. The sample contains:	chitin	starch	cellulose	glycogen	○ ○ ○ ●
101. Cotton shows no change in iodine solution. It is made of:	amylose	cellulose	starch	glycogen	○ ● ○ ○

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Questions	A	B	C	D	A B C D
102. Benedict's reagent is heated with a solution and a red precipitate forms. The solution contains:	starch	protein	lipid	glucose	○ ○ ○ ●
103. A food sample gives a purple ring in Molisch's test. It contains:	carbohydrate	protein	lipid	nucleic acid	● ○ ○ ○
104. Cattle can digest grass because their gut bacteria secrete an enzyme to digest:	glycogen	cellulose	starch	chitin	○ ● ○ ○
105. A beetle's exoskeleton is stiff because it contains:	chitin	starch	glycogen	cellulose	● ○ ○ ○
106. A polysaccharide is unbranched, soluble in hot water and made of α-1,4 linkages. It is:	glycogen	amylopectin	amylose	cellulose	○ ○ ● ○
107. A sample with 2 ml biuret reagent turns violet. The sample contains:	DNA	lipid	protein	starch	○ ○ ● ○
108. A sample turns red on heating with Millon's reagent. It contains:	protein	starch	fat	glucose	● ○ ○ ○
109. A girl has a deficiency of lysine in diet. Lysine is a(n):	non-essential amino acid	fatty acid	essential amino acid	nucleotide	○ ○ ● ○
110. The body can make glycine from other compounds, so it is a:	steroid	essential amino acid	non-essential amino acid	vitamin	○ ○ ● ○
111. Two amino acids join by a peptide bond. The bond is between the:	C of COOH and N of NH2	C and C of R groups	O and H	N and N	● ○ ○ ○
112. In digestion, peptide bonds are broken by:	pepsin and trypsin	amylase	maltase	lipase	● ○ ○ ○
113. A polypeptide folds into a globular shape stabilized by ionic bonds and disulfide bridges. This is its:	primary structure	secondary structure	quaternary structure	tertiary structure	○ ○ ○ ●
114. A protein has several globules held by hydrophobic interactions. It has:	only tertiary	secondary structure	primary structure	quaternary structure	○ ○ ○ ●
115. In sickle cell anemia, glutamic acid is replaced by valine at position:	one of the β-chain	141 of the α-chain	six of the β-chain	six of the α-chain	○ ○ ● ○
116. Sickle cell anemia is caused by a(n):	extra chromosome	point mutation	deficiency of iron	infection	○ ● ○ ○
117. Sickled red cells block blood flow because they are:	stiff and sticky	large	round and soft	nucleated	● ○ ○ ○
118. A protein is soluble in water, inelastic and can be crystallized. It is likely:	globular	fibrous	structural	peptide	● ○ ○ ○

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119. Hair, nails and feathers are strengthened by the protein:	casein	collagen	ovalbumin	keratin	○ ○ ○ ●
120. Bone matrix and cartilage contain the protein:	insulin	collagen	keratin	casein	○ ● ○ ○
121. Egg white protein used to store amino acids is:	ovalbumin	keratin	collagen	fibrinogen	● ○ ○ ○
122. A blood clot forms after injury using the plasma protein:	keratin	fibrinogen	casein	collagen	○ ● ○ ○
123. A fat stays solid at room temperature. It most likely has many:	unsaturated fatty acids	saturated fatty acids	nucleotides	amino acids	○ ● ○ ○
124. Vegetable oils are liquid because their fatty acids are:	amino acids	sugars	unsaturated	saturated	○ ○ ● ○
125. Tristearin melts at 71 °C while triolein melts at -17 °C because tristearin has:	double bonds	saturated fatty acids	phosphate	short chains	○ ● ○ ○
126. Margarine is produced from oils by:	hydrogenation	hydrolysis	dehydration	oxidation	● ○ ○ ○
127. A drop of test solution leaves a translucent greasy spot on paper. It contains:	protein	lipid	glucose	starch	○ ● ○ ○
128. A mixture with Sudan III forms a dark red layer. The test shows:	protein	starch	glucose	lipid	○ ○ ○ ●
129. Phospholipids form a thin layer on water because they are:	fully nonpolar	fully polar	amphipathic	neutral lipids	○ ○ ● ○
130. A molecule has a phosphate head and two fatty acid tails. It is a:	wax	phospholipid	steroid	triglyceride	○ ● ○ ○
131. Leaf surfaces are waterproofed by a wax called:	cutin	cholesterol	glycogen	lecithin	● ○ ○ ○
132. Vitamin A and phytol are examples of:	phospholipids	waxes	steroids	terpenes	○ ○ ○ ●
133. Natural rubber is a:	protein	polyterpene	polysaccharide	steroid	○ ● ○ ○
134. A patient takes aspirin to reduce fever and pain by inhibiting synthesis of:	steroids	amino acids	prostaglandins	waxes	○ ○ ● ○
135. A DNA sample has 30% adenine. The percentage of thymine is:	30%	60%	20%	70%	● ○ ○ ○
136. A DNA sample has 20% guanine. The percentage of cytosine is:	20%	80%	60%	30%	● ○ ○ ○

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137. A DNA sample has 30% adenine. The percentage of guanine is:	70%	30%	40%	20%	○ ○ ○ ●
138. A DNA strand reads A-T-G-C. The complementary strand reads:	T-A-C-G	G-C-A-T	A-T-G-C	U-A-C-G	● ○ ○ ○
139. A DNA template reads T-A-C. The mRNA codon formed is:	U-A-C	T-A-C	A-T-G	A-U-G	○ ○ ○ ●
140. A protein has 100 amino acids. The length of its mRNA coding region is:	200 nucleotides	100 nucleotides	600 nucleotides	300 nucleotides	○ ○ ○ ●
141. During DNA synthesis, nucleotides are joined by phosphodiester bonds between 5' phosphate and:	3' OH	2' OH	1' carbon	base	● ○ ○ ○
142. A cloverleaf-shaped RNA of 75 to 90 nucleotides carries amino acids to the ribosome. It is:	DNA	tRNA	rRNA	mRNA	○ ● ○ ○
143. A scientist finds an RNA that makes up about 80% of total cell RNA and forms part of ribosomes. It is:	DNA	mRNA	tRNA	rRNA	○ ○ ○ ●
144. A cell must carry a gene's message from the nucleus to the ribosome. The molecule used is:	rRNA	mRNA	ATP	tRNA	○ ● ○ ○
145. An amino acid is attached to the 3' end of a tRNA. This end always has the sequence:	AUG	GGU	UUU	CCA	○ ○ ○ ●
146. A ribosome reads mRNA codons with the help of tRNA to build a protein. This step is:	replication	transcription	translation	digestion	○ ○ ● ○
147. A scientist describes the flow of information from DNA to RNA to protein. This idea is the:	central dogma	fluid mosaic model	Chargaff's rule	cell theory	● ○ ○ ○
148. A patient's myelin sheath of nerve fibres is damaged. Which conjugated molecule is abundant in it?	Waxes	Nucleoproteins	Lipoproteins	Glycolipids	○ ○ ○ ●
149. A blood grouping test depends on antigens that are protein joined to carbohydrate. These are:	glycolipids	nucleoproteins	lipoproteins	glycoproteins	○ ○ ○ ●
150. A scientist isolates chromosomes and ribosomes. Both contain:	nucleoproteins	waxes	lipoproteins	glycolipids	● ○ ○ ○