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SSC-I NATIONAL BOOK FOUNDATION FBISE

BIOLOGY TEST - CHAPTER 7: METABOLISM

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 word metabolism literally means to:	grow	digest	divide	change	○○○●
2. The sum of all chemical reactions in a living cell is called:	digestion	metabolism	respiration	homeostasis	○●○○
3. Reactions that break complex molecules into simpler ones are:	catabolic reactions	anabolic reactions	condensation only	photolytic reactions	●○○○
4. Reactions that build complex molecules from simpler ones are:	catabolic reactions	hydrolytic reactions	anabolic reactions	oxidative reactions	○○●○
5. Which of these is a catabolic process?	Photosynthesis	Protein synthesis	Glycogen formation	Digestion of food	○○○●
6. Which of these is an anabolic process?	Photosynthesis	Digestion	Cellular respiration	Fermentation	●○○○
7. Condensation of glucose into glycogen in liver is:	a catabolic reaction	a fermentation	a glycolysis step	an anabolic reaction	○○○●
8. Usually, energy is released in catabolism and is:	lost completely	stored in water	used in anabolism	used in digestion only	○○●○
9. Biological catalysts are called:	enzymes	hormones	vitamins	antibodies	●○○○
10. Most enzymes are chemically:	lipids	carbohydrates	globular proteins	nucleic acids	○○●○
11. Enzymes that are RNA in nature are called:	zymogens	ribozymes	isozymes	coenzymes	○●○○
12. The specificity of an enzyme is determined by:	temperature of the cell	size of the cell	genes active in the cell	amount of water	○○●○
13. Molecules on which an enzyme acts are called:	products	substrates	cofactors	inhibitors	○●○○
14. Substances formed after enzyme action are called:	substrates	products	reactants	activators	○●○○

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Questions	A	B	C	D	A B C D
15. Enzymes that work inside the cell are:	extracellular enzymes	intracellular enzymes	hormones	antibodies	○●○○
16. Which is an example of an intracellular enzyme system?	Pepsin	Glycolysis enzymes	Salivary amylase	Trypsin	○●○○
17. Which is an extracellular enzyme?	Pepsin	Glycolysis enzymes	ATP synthase	Hexokinase	●○○○
18. Fungi and bacteria digest food using:	extracellular enzymes	intracellular enzymes only	hormones	vitamins	●○○○
19. The study of structure, type and role of enzymes is:	enzymatics	cytology	histology	enzymology	○○○●
20. Salivary amylase digests:	protein	fat	cellulose	starch	○○○●
21. Enzymes speed up reactions by about:	millions of times	two times	ten times	a hundred times	●○○○
22. After a reaction is complete, an enzyme:	is used up	becomes the product	is converted to substrate	remains unchanged	○○○●
23. A very small amount of enzyme can act on a huge amount of substrate because it:	is consumed slowly	is reused repeatedly	changes into substrate	multiplies itself	○●○○
24. Amylase acts only on starch, not on proteins. This shows:	enzyme inhibition	enzyme saturation	enzyme specificity	denaturation	○○●○
25. A non-protein helper required by an enzyme is a:	substrate	product	cofactor	inhibitor	○○●○
26. Metal ions like Zn^{2+} and Cu^{2+} acting as cofactors are called:	coenzymes	prosthetic groups	inhibitors	activators	○○○●
27. Salivary amylase is activated by:	sodium ions only	chloride ions	calcium carbonate	iron ions	○●○○
28. An organic cofactor permanently attached to an enzyme is a:	coenzyme	activator	substrate	prosthetic group	○○○●
29. Which is an example of a prosthetic group?	Haem group	NAD	Zn^{2+}	Chloride ion	●○○○
30. A detachable organic cofactor is called a:	coenzyme	prosthetic group	activator	substrate	●○○○
31. Which is an example of a coenzyme?	FAD	Zn^{2+}	Haem	NAD	○○○●

Questions	A	B	C	D	A B C D
32. FAD stands for:	Fatty Acid Dinucleotide	Flavin Adenosine Diphosphate	Flavin Adenine Dinucleotide	Fructose Adenine Dinucleotide	○○●○
33. NAD stands for:	Nicotinamide Adenine Dinucleotide	Nitrogen Adenine Dinucleotide	Nicotinic Acid Diphosphate	Nucleic Adenine Diphosphate	●○○○
34. A series of connected reactions with intermediates is a:	enzyme complex	metabolic pathway	substrate chain	cofactor cycle	○●○○
35. In a metabolic pathway, enzymes work:	randomly	only one at a time in separate cells	only outside the cell	together in a specific sequence	○○○●
36. Minimum extra energy needed to start a reaction is:	kinetic energy	free energy	activation energy	heat energy	○○●○
37. Enzymes speed up reactions by:	raising activation energy	adding substrate	raising temperature	lowering activation energy	○○○●
38. Due to enzymes, reactions can occur at:	boiling point	freezing point	body temperature	very high pressure	○○●○
39. The part of an enzyme where substrate binds is the:	active site	allosteric site	cofactor site	product site	●○○○
40. The active site is usually:	the largest part of the enzyme	a flat surface	a small cavity of specific shape	made of lipids	○○●○
41. The temporary complex of enzyme and substrate is the:	EP complex	EI complex	ADP complex	ES complex	○○○●
42. Correct order of enzyme action is:	E+S → EP → ES → E+P	E+S → ES → EP → E+P	ES → E+S → EP → P	E+P → EP → ES → S	○●○○
43. The ES complex is converted into:	ATP	inhibitor complex	EP complex	denatured enzyme	○○●○
44. The rate of an enzyme reaction first rises with temperature up to the:	freezing point	boiling point	optimum temperature	minimum temperature	○○●○
45. Optimum temperature for human enzymes is:	20°C to 25°C	36°C to 38°C	50°C to 60°C	0°C to 10°C	○●○○
46. At very high temperature an enzyme:	works fastest	becomes a substrate	is denatured	is converted to ATP	○○●○
47. At very low temperature enzymes:	are denatured permanently	become inactive	work faster	form new substrates	○●○○
48. Pepsin works best at pH:	5	2	7	8	○●○○

Questions	A	B	C	D	A B C D
49. Trypsin works best at pH:	8	2	4	6	●○○○
50. Pepsin works in the:	mouth	stomach	small intestine	large intestine	○●○○
51. Trypsin works in the:	small intestine	stomach	mouth	liver	●○○○
52. Extreme changes in pH cause the enzyme to:	denature	multiply	become substrate	produce ATP	●○○○
53. Rate of reaction rises with substrate concentration up to a limit due to:	saturation of active sites	denaturation	lack of water	excess enzyme	●○○○
54. At saturation, increasing substrate concentration:	has no further effect	doubles the rate	stops the reaction	denatures enzyme	●○○○
55. At saturation, all the enzyme's active sites are:	occupied by substrate	destroyed	free	bound to inhibitors	●○○○
56. Molecules that stop enzymatic reactions are:	inhibitors	activators	products	coenzymes	●○○○
57. Molecules that increase enzyme reaction rate are:	activators	inhibitors	substrates	poisons	●○○○
58. In the starch experiment, a blue-black colour with iodine shows:	starch is absent	protein is present	glucose is present	starch is present	○○○●
59. At optimum temperature in the starch experiment, iodine gives:	no blue-black colour	blue-black colour	red colour	pink colour	●○○○
60. At 80°C in the amylase experiment, starch:	remains undigested	is fully digested	turns to protein	turns to fat	●○○○
61. Biuret solution is used to test for:	starch	glucose	protein	fat	○○●○
62. Biuret reagent gives which colour with protein?	Blue-black	Pink or purple	Brick red	Green	○●○○
63. In the pepsin experiment, protein is digested in:	alkaline pH	neutral pH	acidic pH	all pH equally	○○●○
64. Enzyme inhibition means enzymes cannot work due to:	too much substrate	optimum pH	chemicals at the reaction site	a coenzyme	○○●○
65. External factors causing enzyme inhibition include:	water and glucose	oxygen	cyanide and antibiotics	starch and sugar	○○●○

Questions	A	B	C	D	A B C D
66. Accumulated products can temporarily:	raise activation energy	create substrate	denature DNA	inhibit enzyme activity	○○○●
67. A competitive inhibitor resembles the:	product	cofactor	substrate	allosteric site	○○●○
68. Competitive inhibitors bind to the:	allosteric site	active site	cell membrane	nucleus	○●○○
69. Competitive inhibition can be reversed by:	increasing substrate concentration	raising pH	adding more inhibitor	cooling	●○○○
70. A non-competitive inhibitor attaches at the:	active site	allosteric site	substrate	product	○●○○
71. Non-competitive inhibitors do not resemble the:	enzyme	substrate	cell	inhibitor	○●○○
72. A non-competitive inhibitor stops reaction by:	occupying the active site	raising substrate	altering the enzyme's shape	adding coenzyme	○○●○
73. ATP stands for:	Adenosine Triphosphate	Adenine Triphosphate	Adenosine Diphosphate	Amino Triphosphate	●○○○
74. ATP is called the energy currency of the cell because it:	stores and releases energy	is a protein	is genetic material	is a pigment	●○○○
75. Energy remains stored in ATP until:	it is excreted	oxygen is lost	water is added	the cell needs it	○○○●
76. ATP is converted to ADP by:	hydrolysis	condensation	fermentation	photolysis	●○○○
77. ADP and phosphate are converted back to ATP by:	hydrolysis	digestion	oxidation of water	condensation	○○○●
78. Adenine is a:	five-carbon sugar	phosphate group	single-ringed base	double-ringed nitrogen base	○○○●
79. The sugar in ATP is:	glucose	deoxyribose	fructose	ribose	○○○●
80. Adenine plus ribose makes:	AMP	ADP	adenosine	ATP	○○●○
81. Adenosine plus one phosphate gives:	ADP	AMP	ATP	NAD	○●○○
82. Bonds between phosphate groups in ATP are called:	hydrogen bonds	peptide bonds	ionic bonds	high energy bonds	○○○●

Questions	A	B	C	D	A B C D
83. High energy bonds in ATP are shown by:	wavy lines	double lines	dotted circles	arrows	●○○○
84. Photosynthesis occurs in plants, algae and:	cyanobacteria	fungi	protozoa	viruses	●○○○
85. Photosynthesis requires light energy and:	haemoglobin	melanin	chlorophyll	carotene only	○○●○
86. The by-product of photosynthesis is:	carbon dioxide	nitrogen	oxygen	hydrogen	○○●○
87. The photosynthesis equation uses CO_2 and:	oxygen	water	glucose	ATP	○●○○
88. The balanced equation uses how many CO_2 molecules?	12	2	1	6	○○○●
89. Glucose formula produced in photosynthesis is:	$C_6H_{12}O_6$	$C_{12}H_{22}O_{11}$	CH_2O_2	C_6H_6	●○○○
90. In the Hydrilla experiment, sodium bicarbonate provides:	oxygen	nitrogen	light	carbon dioxide	○○○●
91. The gas collected in the Hydrilla test tube is:	oxygen	carbon dioxide	hydrogen	nitrogen	●○○○
92. A burning match stick burns brightly in the gas, confirming:	carbon dioxide	nitrogen	hydrogen	oxygen	○○○●
93. The two phases of photosynthesis are:	glycolysis and Krebs	aerobic and anaerobic	fermentation and Calvin	light dependent and independent	○○○●
94. Light dependent reactions take place in the:	stroma	mitochondria	thylakoid membranes	cytoplasm	○○●○
95. Light independent reactions take place in the:	thylakoid	cytoplasm	matrix	stroma	○○○●
96. Light reactions produce:	glucose and CO_2	ATP and pyruvate	NADH and $FADH_2$	ATP and NADPH	○○○●
97. Photosynthetic pigments are arranged in clusters called:	photosystems	ribosomes	grana only	stomata	●○○○
98. Light reactions start from:	photosystem II	photosystem I	Calvin cycle	Krebs cycle	●○○○
99. Splitting of water in light reactions is called:	hydrolysis	glycolysis	fermentation	photolysis	○○○●

Questions	A	B	C	D	A B C D
100. Photolysis compensates electron loss of:	mitochondria	stroma	photosystem II chlorophyll	RuBP	○○●○
101. Oxygen released in photosynthesis comes from:	carbon dioxide	glucose	water	NADPH	○○●○
102. Electron transport chain in light reactions gives energy for:	glucose breakdown	water uptake	CO_2 release	ATP synthesis	○○○●
103. $NADP^+$ is reduced to:	NADH	ATP	$FADH_2$	NADPH	○○○●
104. Light independent reactions are also called the:	Krebs cycle	Calvin cycle	Hill reaction	Cori cycle	○●○○
105. The Calvin cycle was described by:	Melvin Calvin	Hans Krebs	Louis Pasteur	Robert Hooke	●○○○
106. In the Calvin cycle, CO_2 combines with:	PGA	RuBP	G3P	pyruvate	○●○○
107. RuBP is a:	3-carbon molecule	5-carbon molecule	6-carbon molecule	2-carbon molecule	○●○○
108. The unstable 6-carbon intermediate splits into:	two 3PGA molecules	two RuBP	glucose	three CO_2	●○○○
109. 3PGA is reduced to G3P by:	NADH and $FADH_2$	oxygen	water	NADPH and ATP	○○○●
110. G3P is a:	3-carbon sugar	5-carbon sugar	6-carbon acid	2-carbon acetyl	●○○○
111. Part of the G3P is used to regenerate:	RuBP	PGA	$NADP^+$ only	chlorophyll	●○○○
112. Environmental factors affecting photosynthesis are:	enzymes	cofactors	inhibitors	limiting factors	○○○●
113. Which is a limiting factor of photosynthesis?	Glucose	Chlorophyll b	Light intensity	Pyruvate	○○●○
114. Optimum temperature for photosynthesis in the book is:	10°C	45°C	60°C	25°C	○○○●
115. More CO_2 increases photosynthesis only:	without limit	up to a specific point	at night	at 0°C	○●○○
116. The first phase of respiration is:	Krebs cycle	glycolysis	ETC	fermentation	○●○○

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Questions	A	B	C	D	A B C D
117. Glycolysis takes place in the:	mitochondrial matrix	cytoplasm	inner membrane	chloroplast	○●○○
118. Glycolysis breaks glucose into:	two acetyl CoA	two pyruvic acid molecules	six CO_2	two lactic acids	○●○○
119. Net ATP gain from glycolysis is:	4	36	2	0	○○●○
120. Glycolysis occurs in:	aerobic only	both aerobic and anaerobic respiration	anaerobic only	photosynthesis	○●○○
121. In anaerobic respiration pyruvic acid is:	converted to water	fully oxidised	converted to glucose	not fully oxidised	○○○●
122. Anaerobic breakdown of pyruvic acid is also called:	photolysis	fermentation	Calvin cycle	oxidation	○●○○
123. Alcoholic fermentation yields ethyl alcohol and:	carbon dioxide	lactic acid	oxygen	water	●○○○
124. Alcoholic fermentation occurs in:	muscle cells	human neurons	yeast	green plants	○○●○
125. Lactic acid fermentation occurs in:	yeast cells	chloroplasts	muscle cells in vigorous exercise	root hairs	○○●○
126. Bacteria converting milk to yogurt produce:	ethanol	acetic acid	lactic acid	citric acid	○○●○
127. Which industry uses yeast fermentation?	Cheese making	Baking	Yogurt making	Dairy only	○●○○
128. Early organisms used anaerobic respiration because early earth had no:	water	carbon dioxide	free oxygen	sunlight	○○●○
129. Aerobic respiration needs:	light	oxygen	chlorophyll	only yeast	○●○○
130. Aerobic respiration produces CO_2, water and:	less energy than anaerobic	lactic acid	ethanol	more energy	○○○●
131. Number of main phases of aerobic respiration is:	two	three	five	four	○○○●
132. Formation of acetyl CoA releases:	CO_2 and NADH	ATP only	oxygen	lactic acid	●○○○
133. Pyruvic acid is oxidised to a:	three-carbon PGA	six-carbon glucose	five-carbon RuBP	two-carbon acetyl group	○○○●

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Questions	A	B	C	D	A B C D
134. Krebs cycle occurs in the:	cytoplasm	mitochondrial matrix	inner membrane	stroma	○●○○
135. Products of Krebs cycle include:	glucose and O_2	CO_2, NADH and $FADH_2$	lactic acid	ethanol	○●○○
136. Electron transport chain is in the:	matrix	cytoplasm	stroma	inner mitochondrial membrane	○○○●
137. Final electron acceptor in ETC is:	NAD^+	water	CO_2	oxygen	○○○●
138. Water forms in respiration when oxygen combines with:	carbon	pyruvate	hydrogen ions and electrons	glucose	○○●○
139. Each NADH in ETC yields about how many ATP?	2	3	1	4	○●○○
140. Each $FADH_2$ in ETC yields about how many ATP?	3	1	2	4	○○●○
141. Net ATP from complete oxidation of one glucose (book) is:	2	36	4	18	○●○○
142. In aerobic respiration, glucose is:	reduced	synthesised	oxidised	unchanged	○○●○
143. Light independent reactions are also called:	thylakoid reactions	dark reactions	glycolysis	ETC	○●○○
144. Grass under a carton turns yellow due to lack of:	light	oxygen	water	carbon dioxide	●○○○
145. ATP energy is used in:	only photosynthesis	muscle contraction and nerve impulses	only digestion of starch	none of life processes	○●○○
146. Which organ uses the most ATP in the human body?	Skin	Bones	Brain	Hair	○○●○
147. Photosynthesis converts light energy into:	chemical energy	heat energy	sound energy	nuclear energy	●○○○
148. Anaerobic respiration releases _____ energy than aerobic.	more	less	equal	ten times more	○●○○
149. During glycolysis, two NAD^+ molecules are:	oxidised to NADP	converted to ATP	reduced to NADH	destroyed	○○●○
150. In the Krebs cycle, 2 acetyl CoA yield how many CO_2?	2	6	4	1	○○●○

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