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HSSC-I NATIONAL BOOK FOUNDATION FBISE

BIOLOGY TEST - CHAPTER 3: ENZYMES

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 sum of all the chemical reactions going on in a cell is known as:	homeostasis	catabolism	metabolism	digestion	○○●○
2. Biological catalysts that speed up biochemical reactions without being consumed are called:	hormones	vitamins	enzymes	antibodies	○○●○
3. In the cell, enzymes exist as:	crystals	colloids	solid granules only	gases	○●○○
4. Enzymes can be defined as biological polymers that:	catalyse biochemical reactions	produce energy directly	transport oxygen	store genetic information	●○○○
5. All enzymes (except ribozymes) are:	globular proteins	fibrous proteins	lipids	polysaccharides	●○○○
6. Ribozymes are enzymes which consist of:	DNA	carbohydrates	RNA	lipids	○○●○
7. Ribozymes are found in the:	chloroplasts	ribosomes	lysosomes	vacuoles	○●○○
8. Peptidyl transferase is an example of a:	vitamin	hormone	ribozyme	polysaccharide	○○●○
9. During the early nineteenth century, two French chemists who studied the digestion of starch by barley extract were:	Payen and Persoz	Pasteur and Redi	Fischer and Koshland	Hooke and Virchow	●○○○
10. Payen and Persoz named the starch-digesting substance from barley:	pepsin	amylase	maltase	diastase	○○○●
11. The catalytic activity of an enzyme is located in its:	active site	cell wall	allosteric site only	ribosome	●○○○
12. The active site of an enzyme is a specific charge-bearing:	linear chain	spherical nucleus	three-dimensional cavity	flat surface	○○●○
13. The substrate is attached to the active site by:	peptide bonds	ionic crystals	non-covalent interactions	covalent bonds only	○○●○
14. The non-covalent interactions at the active site include hydrogen bonding and:	peptide bonding	metallic bonding	hydrophobic interactions	nuclear forces	○○●○

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Questions	A	B	C	D	A B C D
15. The active site usually consists of how many amino acids?	50–100	3–12	1–2	more than 500	○●○○
16. The amino acids forming the active site are brought together by:	primary structure only	secondary and tertiary folding of the protein	cell division	hydrolysis	○●○○
17. The active site of aldolase consists of the amino acids glycine, histidine and:	valine	alanine	cysteine	leucine	○●○○
18. The two functional regions of an active site are the binding site and the:	regulatory site	catalytic site	inhibitor site	allosteric site	○●○○
19. Amino acids that form bonds with the substrate constitute the:	binding site	prosthetic group	catalytic site	allosteric site	●○○○
20. Amino acids that convert the substrate into product constitute the:	catalytic site	cofactor	allosteric site	binding site	●○○○
21. The reactant that is converted into product by an enzyme is called the:	inhibitor	cofactor	substrate	coenzyme	○○●○
22. Some enzymes require a non-protein part called the:	inhibitor	product	substrate	cofactor	○○○●
23. An enzyme combined with its cofactor, which is active, is called a:	zymogen	holoenzyme	apoenzyme	proenzyme	○●○○
24. The inactive protein part of an enzyme without its cofactor is called an:	holoenzyme	coenzyme	apoenzyme	isoenzyme	○○●○
25. Pepsin is secreted by the gastric glands in the inactive state called:	pepsinase	pepsinogen	prepepsin	pepsidase	○●○○
26. Pepsinogen is changed into active pepsin when exposed to:	water only	NaOH	HCl	bile	○○●○
27. How many types of cofactors are there?	2	3	4	5	○●○○
28. The three types of cofactors are inorganic ions, organic molecules and:	substrates	apoenzymes	inhibitors	prosthetic groups	○○○●
29. Inorganic cofactors are attached to enzymes only when the substrate binds, so they are called:	allosteric sites	prosthetic groups	apoenzymes	detachable cofactors	○○○●
30. In the reaction glucose + ATP → glucose-6-phosphate + ADP, the enzyme hexokinase requires the ion:	Mg^{2+}	Zn^{2+}	Fe^{3+}	Cu^{2+}	●○○○
31. Coenzymes are the derivatives of:	minerals	vitamins	nucleotides only	lipids	○●○○

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32. Examples of common coenzymes include ATP, NAD^+ and:	FAD	ADP only	DNA	RNA	●○○○
33. A prosthetic group is:	a vitamin only	covalently bonded and permanently attached to the enzyme	loosely attached and detachable	an inhibitor	○●○○
34. An iron-containing porphyrin ring attached to cytochromes is an example of a:	prosthetic group	substrate	coenzyme	inorganic ion	●○○○
35. In the oxidation of ethyl alcohol to acetaldehyde, the coenzyme used with alcohol dehydrogenase is:	ADP	ATP	NAD^+	FAD	○○●○
36. In the enzyme reaction E + S → ES → EP → E + P, the complex ES stands for:	enzyme–inhibitor complex	enzyme–cofactor complex	enzyme–product complex	enzyme–substrate complex	○○○●
37. The lock and key model of enzyme action was proposed by:	Koshland	Emil Fischer	Payen	Pasteur	○●○○
38. The lock and key model was proposed in the year:	1894	1885	1665	1959	●○○○
39. In the lock and key model, the enzyme is the lock and the substrate is the:	key	handle	door	keyhole	●○○○
40. According to the lock and key model, the enzyme is a:	gas	liquid	flexible structure	rigid structure	○○○●
41. In the lock and key model, the shape of the active site:	changes during binding	does not change during binding	disappears	becomes smaller	○●○○
42. The enzymes that work according to the lock and key model are called:	allosteric enzymes	ribozymes	regulatory enzymes	non-regulatory enzymes	○○○●
43. Examples of enzymes working by the lock and key model are:	DNA polymerase and RNA polymerase	sucrase and maltase	pepsin and trypsin	hexokinase and carbonic anhydrase	○●○○
44. When an enzyme can catalyse only one substrate and essentially no others, it shows:	group specificity	absolute specificity	broad specificity	no specificity	○●○○
45. An example of an enzyme with absolute specificity is:	amylase	lipase	pepsin	urease	○○○●
46. The enzyme urease changes urea and water into:	fatty acids and glycerol	ammonia and carbon dioxide	amino acids	glucose and fructose	○●○○
47. The induced fit model was proposed by:	Persoz	Fischer	Payen	Koshland	○○○●
48. The induced fit model was proposed in the year:	1894	1961	1959	1885	○○●○

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Questions	A	B	C	D	A B C D
49. According to the induced fit model, the active site is:	flexible	permanent in shape only	absent	rigid	●○○○
50. In the induced fit model, after the reaction is completed, the active site:	remains deformed	is destroyed	regains its original shape	becomes inactive	○○●○
51. Because of the flexibility of the active site, an enzyme can carry out:	only unrelated reactions	only one reaction	more than one type of related reaction	no reaction	○○●○
52. An example of an enzyme following the induced fit model that adds O_2 to haemoglobin is:	sucrase	urease	carbonic anhydrase	maltase	○○●○
53. Enzymes which follow the induced fit mechanism are called:	non-regulatory enzymes	ribozymes	regulatory or allosteric enzymes	holoenzymes	○○●○
54. An example of a regulatory enzyme is:	maltase	sucrase	urease	hexokinase	○○○●
55. In the induced fit model, the active site has to undergo a ___ to improve binding.	nuclear change	temperature change	conformational change	chemical change	○○●○
56. The energy that must be added to cause molecules to react with one another is called the:	kinetic energy	energy of activation	free energy	potential energy	○●○○
57. In non-living systems, the energy of activation is generally provided by:	enzymes	heat	water	light only	○●○○
58. Large amounts of heat cannot be used as the energy of activation in living systems because cells are composed of:	temperature-sensitive protein molecules	water only	salts only	lipids only	●○○○
59. About how many chemical reactions are carried out in a cell at any time?	1000	1 000 000	10	100 000	●○○○
60. The living system works in:	high temperature conditions	vacuum conditions	freezing conditions	isothermal conditions	○○○●
61. An enzyme speeds up a reaction by:	changing the products	raising the energy of activation	lowering the energy of activation	adding heat	○○●○
62. The energy of activation is the energy required to:	break the existing bonds and begin the reaction	release the products	form the enzyme	digest the substrate	●○○○
63. The rate of an enzymatic reaction is measured by the amount of substrate changed or the amount of:	enzyme added	water used	product formed in a period of time	energy lost	○○●○
64. The external conditions that affect the rate of enzymatic reactions include temperature, pH and:	pressure of air only	enzyme and substrate concentration	sound	colour	○●○○
65. Within certain limits, an increase of 10 °C in the temperature:	has no effect	stops the reaction	halves the rate of reaction	doubles the rate of reaction	○○○●

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66. The temperature that promotes maximum enzyme activity is called the:	critical temperature	optimum temperature	maximum temperature	minimum temperature	○●○○
67. Above the optimum temperature, the rate of reaction decreases because the enzyme becomes:	smaller	more active	a substrate	denatured	○○○●
68. The temperature that causes denaturation of an enzyme is called the:	optimum temperature	minimum temperature	boiling point	maximum temperature	○○○●
69. The bonds most sensitive to temperature change in an enzyme are the:	ionic crystals	peptide bonds	hydrogen bonds	covalent bonds	○○●○
70. The optimum temperature of human enzymes is about:	37–38 °C	45–50 °C	20–25 °C	60–70 °C	●○○○
71. Bacteria living in hot springs may have enzymes with an optimum temperature of:	70 °C or higher	10 °C	20 °C	37 °C	●○○○
72. Enzymes from thermophilic bacteria are used in:	vaccines	biological washing powders for high temperature washes	toothpaste	antacids	○●○○
73. At near or below freezing point, enzymes are:	converted into substrates	destroyed	denatured permanently	inactivated but not denatured	○○○●
74. The temperature at which an inactive enzyme becomes active again is called the:	maximum temperature	optimum temperature	minimum temperature	denaturing temperature	○○●○
75. The narrow range of pH at which the maximum rate of reaction is achieved is called the:	neutral pH	optimum pH	minimum pH	maximum pH	○●○○
76. Enzyme conformation is sensitive to pH changes because pH influences the charges on:	the substrate only	the cell membrane	the amino acid side chains	the water molecules only	○○●○
77. Extreme changes in pH cause:	denaturation of the enzyme	increase in substrate	formation of coenzymes	activation of the enzyme	●○○○
78. The optimum pH for most enzymes falls in the range:	6–8	13–14	1–3	9–12	●○○○
79. The enzyme pepsin is active in an acidic medium at pH:	7	10	8	2	○○○●
80. The enzyme trypsin shows maximum activity in an alkaline medium at pH:	2	1	5	8	○○○●
81. Papain from green papaya latex acts in:	both acidic and alkaline media	alkaline medium only	acidic medium only	neutral medium only	●○○○
82. When the substrate is in unlimited supply and other conditions are constant, the rate of reaction becomes:	directly proportional to the enzyme concentration	inversely proportional to the enzyme concentration	zero	independent of enzyme concentration	●○○○

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83. By increasing the concentration of enzyme, the number of available active sites:	remains the same	decreases	increases	becomes zero	○○●○
84. The phenomenon in which an enzyme fails to catalyse a reaction is called:	enzyme activation	enzyme specificity	enzyme synthesis	enzyme inhibition	○○○●
85. Molecules which react with an enzyme but are not converted into products are called:	substrates	coenzymes	enzyme inhibitors	cofactors	○○●○
86. Molecules that act as enzyme inhibitors include poisons, cyanides, antibodies, antimetabolites, sulpha drugs and:	glucose	vitamins	water	penicillin	○○○●
87. Penicillin blocks the active site of an enzyme that is unique to:	plants	fungi	bacteria	humans	○○●○
88. The two types of enzyme inhibition are competitive and:	non-competitive	allosteric only	active	passive	●○○○
89. In competitive inhibition, the inhibitor competes with the substrate for the:	active site	nucleus	cell wall	allosteric site	●○○○
90. A competitive inhibitor is usually structurally ___ to the normal substrate.	similar	larger in all cases	unrelated	opposite	●○○○
91. Competitive inhibition is also called:	irreversible inhibition	reversible inhibition	permanent inhibition	feedback activation	○●○○
92. In competitive inhibition, increasing the substrate concentration relative to the inhibitor:	increases the inhibition	has no effect	denatures the enzyme	reduces the inhibition	○○○●
93. An example of a competitive inhibitor of succinate dehydrogenase is:	cyanide	malonate	mercury	silver	○●○○
94. Succinate dehydrogenase catalyses the formation of fumarate from:	pyruvate	succinate	malate	citrate	○●○○
95. Competitive inhibition supports the:	theory of evolution	lock and key hypothesis	germ theory	cell theory	○●○○
96. Sulphonamides, used to combat bacterial infection, act as:	coenzymes	cofactors	competitive inhibitors	non-competitive inhibitors	○○●○
97. In non-competitive inhibition, the inhibitor binds to the enzyme at the:	active site	allosteric site	substrate	cell membrane	○●○○
98. In non-competitive inhibition, substrate concentration has:	no effect on the inhibition	a reversing effect	a doubling effect	a large effect on the inhibition	●○○○
99. Reversible non-competitive inhibitors work by preventing the formation of:	enzyme–product complexes	substrates	cofactors	enzyme–substrate complexes	●○○○

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100. An example of reversible non-competitive inhibition is:	inhibition by malonate	inhibition by cyanide	inhibition by mercury	feedback inhibition	○○○●
101. Irreversible non-competitive inhibitors destroy the enzyme by altering its:	shape	temperature	colour	number of substrates	●○○○
102. Examples of irreversible non-competitive inhibitors are cyanides and:	sulphonamides	water	vitamins	salts of heavy metals	○○○●
103. Cyanides kill organisms by inhibiting:	amylase	pepsin	cytochrome oxidase	trypsin	○○●○
104. Cyanides block enzymes by combining with:	iron in the prosthetic group	calcium in bones	sodium in cells	chlorine in cytoplasm	●○○○
105. Heavy metal ions such as Hg, Ag and Cu combine with the ___ groups in the enzyme.	thiol (–SH)	carboxyl (–COOH)	amino ($–NH_2$)	phosphate	●○○○
106. When an enzyme is inhibited by its own product, it is called:	competitive inhibition	allosteric activation	feedback inhibition	enzyme induction	○○●○
107. In the pathway in which aspartate becomes threonine, the end product threonine binds to the allosteric site of:	the cell wall	the substrate	enzyme 5	enzyme 1	○○○●
108. When all the threonine is consumed, the pathway:	reverses	becomes irreversible	stops permanently	resumes its activity	○○○●
109. Di-isopropyl fluorophosphate (DFP, nerve gas) is an example of a:	competitive inhibitor	non-competitive inhibitor	cofactor	coenzyme	○●○○
110. The International Union of Biochemistry gave the classification of enzymes in the year:	1885	1961	1959	1894	○●○○
111. On the basis of reaction type, enzymes are classified into how many groups?	6	3	8	4	●○○○
112. The enzymes that catalyse oxidation and reduction are the:	transferases	oxidoreductases	hydrolases	ligases	○●○○
113. An example of an oxidoreductase is:	cytochrome oxidase	pepsin	phosphohexose isomerase	hexokinase	●○○○
114. The enzymes that transfer a specific functional group other than hydrogen from one substrate to another are:	isomerases	hydrolases	transferases	lyases	○○●○
115. Hexokinase transfers a ___ group from ATP to glucose.	carboxyl	methyl	amino	phosphate	○○○●
116. The enzymes that break large molecules into smaller ones by adding water are:	hydrolases	oxidoreductases	ligases	lyases	●○○○

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117. Pepsin, renin and trypsin are examples of:	isomerases	hydrolases	lyases	ligases	○●○○
118. The enzymes that break specific covalent bonds and remove groups without hydrolysis are:	hydrolases	transferases	lyases	ligases	○○●○
119. An example of a lyase is:	hexokinase	pepsin	DNA polymerase	histidine decarboxylase	○○○●
120. Histidine decarboxylase breaks histidine into carbon dioxide and:	urea	ammonia	histamine	glucose	○○●○
121. The enzymes that bring about intramolecular rearrangement of atoms are:	hydrolases	lyases	ligases	isomerases	○○○●
122. Phosphohexose isomerase changes glucose-6-phosphate into:	fructose-1-phosphate	ribose-5-phosphate	fructose-6-phosphate	glucose-1-phosphate	○○●○
123. The enzymes that join two molecules using the energy of ATP hydrolysis are:	hydrolases	lyases	isomerases	ligases	○○○●
124. Polymerases that link monomers into DNA or RNA are examples of:	oxidoreductases	hydrolases	lyases	ligases	○○○●
125. Enzymes named by adding "ase" to the name of the substrate include:	proteases and lipases	oxidases and reductases	rhodonase	DNA polymerase	●○○○
126. Enzymes named according to the type of reaction include:	amylase and lactase	oxidases and reductases	proteases and lipases	DNA polymerase	○●○○
127. DNA polymerase is named taking into consideration both the substrate and the:	colour of the enzyme	place of the enzyme	source of the enzyme	type of reaction catalysed	○○○●
128. Enzymes that act on proteins are called:	lipases	proteases	carbohydrases	nucleases	○●○○
129. Pepsin and trypsin digest large polypeptides into small polypeptides or:	fatty acids	nucleotides	monosaccharides	peptones	○○○●
130. Lipases hydrolyse lipids into fatty acids and:	glycerol	nucleotides	amino acids	glucose	●○○○
131. Amylase digests starch or glycogen into:	fructose	maltose	glucose only	galactose	○●○○
132. Maltase digests maltose into:	sucrose	galactose	fructose	glucose	○○○●
133. Sucrase digests sucrose into glucose and:	maltose	galactose	fructose	lactose	○○●○

Questions	A	B	C	D	A B C D
134. Lactase digests lactose into galactose and:	maltose	glucose	fructose	sucrose	○●○○
135. RNAases digest RNA into:	amino acids	deoxyribonucleotides	fatty acids	ribonucleotides	○○○●
136. DNAases digest DNA into:	deoxyribonucleotides	amino acids	monosaccharides	ribonucleotides	●○○○
137. Aldolase is used as a diagnostic enzyme in progressive muscular dystrophy, viral hepatitis and cancer of the:	brain	skin	lung	prostate	○○○●
138. Gamma-glutamyl transpeptidase is used in assessing the function of the:	pancreas	heart	lung	liver	○○○●
139. Lactic dehydrogenase is used to differentiate heart attack, anaemia, lung injury or:	skin disease	liver disease	eye disease	bone fracture	○●○○
140. Snake venom inhibits cholinesterase to make the prey lose control of its:	sleep	vision	hearing	muscles	○○○●
141. Snake venom acts as an inhibitor of the essential enzyme:	amylase	pepsin	lipase	cytochrome oxidase	○○○●
142. Hemotoxic snake venoms act on the:	heart and cardiovascular system	bite site only	nervous system	digestive system only	●○○○
143. Neurotoxic snake venom acts on the:	heart	bite site only	nervous system and brain	liver	○○●○
144. Cytotoxic snake venom has a localized action at the:	stomach	heart	site of the bite	brain	○○●○
145. In the lactose-free milk activity, lactase breaks down lactose into:	maltose and fructose	galactose and glucose	sucrose and glucose	glucose and fructose	○●○○
146. The catalytic activity of an enzyme is restricted to its small portion called the:	active site	regulation site	passive site	allosteric site	●○○○
147. The combination of apoenzyme and coenzyme produces a:	prosthetic group	substrate	holoenzyme	inhibitor	○○●○
148. The specificity of enzyme action is due to their:	high molecular weight	pH	surface configuration	hydrogen bonding only	○○●○
149. An essential feature of a competitive inhibitor is its ability to:	modify a substrate	activate an operator gene	combine with a prosthetic group	occupy an active site	○○○●
150. An enzyme increases the rate of a reaction by:	bringing the reacting molecules into precise orientation	shifting the equilibrium	increasing random collisions	supplying energy to start the reaction	●○○○

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