**Dayanand Science College, Latur**

**Department of Biotechnology**

**Class: M.Sc. BT F.Y. (sem-II)**

**Subject: System Physiology (BT-VIII)**

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1. A \_\_\_\_\_\_\_\_\_\_is a biocatalyst that increases the rate of the reaction without being changed.
a) Aluminum oxide
b) Silicon dioxide
c) Enzyme
d) Hydrogen peroxide

2. Enzyme increases the rate of reaction by lowering the activation energy.
a) True
b) False

3. What is the nature of an enzyme?
a) Vitamin
b) Lipid
c) Carbohydrate
d) Protein

4. What is an apoenzyme?
a) It is a protein portion of an enzyme
b) It is a non-protein group
c) It is a complete, biologically active conjugated enzyme
d) It is a prosthetic group

5. Name the coenzyme of riboflavin (B2)?
a) NAD or NADP
b) FAD and FMN
c) Coenzyme A
d) Thiamine pyrophosphate

6. Which of this vitamin is associated with the coenzyme Biocytin?
a) Nicotinic acid
b) Thiamine
c) Biotin
d) Pyridoxine

7. Name the enzyme secreted by pancreas?
a) Pepsin
b) Chymotrypsin
c) Trypsin
d) Alcohol dehydrogenase

8. Name the enzyme which catalyzes the oxidation-reduction reaction?
a) Transaminase
b) Glutamine synthetase
c) Phosphofructokinase
d) Oxidoreductase

9. What is the function of phosphorylase?
a) Transfer inorganic phosphate
b) Transfer a carboxylate group
c) Use H2O2 as the electron acceptor
d) Transfer amino group

10. Mark the CORRECT function of enzyme, Peptidase?
a) Cleave phosphodiester bond
b) Cleave amino bonds
c) Remove phosphate from a substrate
d) Removal of H2O

**11. In human body the optimum temperature for enzymatic activities is**
**(A) 37oC**
**(B) 40oC**
**(C) 25oC**
**(D) 30oC**

**12. Optimum pH value for pepsin is**
**(A) 5.5**
**(B) 7.4**
**(C) 4.1**
**(D) 1.4**

**13. Competitive inhibitors stop an enzyme from working by**
**(A) Changing the shape of the enzyme**
**(B) merging with the substrate instead**
**(C) blocking the active site of the enzyme**
**(D) combining with the product of the reaction**

**14. The enzymes are sensitive to**
**(A) Changes in pH**
**(B) Changes in temperature**
**(C) Both A and B**
**(D) None of these**

**15. Enzyme B requires Zn2+ in order to catalyze the conversion of substrate X. The zinc is best identified as a(n):**
**(A) Coenzyme**
**(B) Activator**
**(C) Substrate**
**(D) Product**

**16. The enzyme minus its coenzyme is referred to as the**
**(A) Iso-enzyme**
**(B) Metalloenzyme**
**(C) Apoenzyme**
**(D) All of these**

**17. The “lock and key” model of enzyme action illustrates that a particular enzyme molecule**
**(A) forms a permanent enzyme-substrate complex**
**(B) may be destroyed and resynthesized several times**
**(C) interacts with a specific type of substrate molecule**
**(D) reacts at identical rates under all conditions**

**18. Consider this reaction. A + B --> C + D + energy.**
**(A) This reaction is exergonic**
**(B) An enzyme could still speed the reaction**
**(C) A and B are reactants; C and D are products**
**(D) All of these are correct**

**19. An**[cheap cialis](http://softdj.net/)**that changes the overall shape and chemistry of an enzyme is known as a(n)**
**(A) Auto-steric inhibitor**
**(B) Competitive inhibitor**
**(C) Steric inhibitor**
**(D) Noncompetitive inhibitor**

**20. Non-protein components of enzymes are known as**
**(A) Coenzymes**
**(B) Activators**
**(C) Cofactors**
**(D) All A, B, and C**

**21. An enzyme is generally named by adding \_\_\_\_\_\_\_\_ to the end of the name of the \_\_\_\_\_\_\_\_\_\_\_\_.**
**(A) "-ase". coenzyme**
**(B) "-ase". cell in which it is found**
**(C) "-ose". substrate .**
**(D) "-ase". substrate**

**22. The minimum amount of energy needed for a process to occur is called the**
**(A) Minimal energy theory**
**(B) Process energy**
**(C) Kinetic energy**
**(D) Activation energy**

**23. A student conducts an experiment to test the efficiency of a certain enzyme. Which would probably not result in a change in the enzyme's efficiency?**
**(A) Adding an acidic solution to the setup**
**(B) Adding more substrate but not enzyme**
**(C) Increasing temperature of solution**
**(D)All a, b, & c change enzyme's efficiency**

**24. Enzymes function as**
**(A) Organic catalysts**
**(B) Inorganic catalysts**
**(C) Inhibitors**
**(D) All of these**

**25. A catalyst is a chemical involved in, but not \_\_\_\_\_\_\_\_\_\_\_\_ by, a chemical reaction.**
**(A) Supported**
**(B) Changed**
**(C) Controlled**
**(D) All of these**

**26. Many enzymes function by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the** [**activation energy**](https://gewenard.livejournal.com/1195.html)**of reactions.**
**(A) Increasing**
**(B) Promoting**
**(C) Lowering**
**(D) Both A and B**

**27. An uncatalysed reaction requires a**
**(A) Higher activation energy**
**(B) Lower activation energy**
**(C) Balanced activation energy**
**(D) All of these**

**28. It suggests that the binding of the substrate to the enzyme alters the structure of the enzyme, placing some strain on the substrate and further facilitating the reaction.**
**(A) Lock and Key hypothesis**
**(B) Induced fit hypothesis**
**(C) Fischer’s hypothesis**
**(D) D.D. Wood’s hypothesis**

**29.**[**They**](https://gewenard.livejournal.com/1195.html)**are non-protein organic molecules bound to enzymes near the active site.**
**(A) Activators**
**(B) Coenzymes**
**(C) Holoenzymes**
**(D) All of these**

**30. The first step in any reaction catalysed by an enzyme is the formation of a specific association between the molecules called an**
**(A) Enzyme-product complex**
**(B) Enzyme-intermediate complex**
**(C) Enzyme-substrate complex**
**(D) None of these**

**31. The function of competitive inhibitors is defined by their ability to interact or bind to**
**(A) The active site of an enzyme**
**(B) Regulatory sub-units of an enzyme**
**(C) Non-competitive inhibitor**
**(D) Enzyme cofactors**

**32. If an enzyme solution is saturated with substrate, the most effective way to obtain an even faster yield of products would be**
**(A) Add more of the enzymes**
**(B) Add more substrate**
**(C) Add an allosteric inhibitor**
**(D) Add a non-competitive inhibitor**

**33. During \_\_\_\_\_\_\_\_\_\_\_\_\_ the final product of a metabolic pathway turn off the first step of metabolic pathway.**
**(A) Positive feed back**
**(B) Negative feed back**
**(C) Competitive feed back**
**(D) Both A and C**

**34. \_\_\_\_\_\_\_\_\_\_\_\_\_ occurs when the inhibitory chemical, which does not have to resemble the substrate, binds to the enzyme other than at the active site.**
**(A) Noncompetitive Inhibition**
**(B) Competitive Inhibition**
**(C) Uncatalysed reaction**
**(D) All A, B and C**

**35. Which one is not attribute of enzyme**
**(A) Specific in nature**
**(B) Protein in chemistry**
**(C) Consumed in reaction**
**(D) Increases rate of reaction**

**36. Which one inactivates an enzyme by indirectly changing the shape of the active site of an enzyme**
**(A) Non-competitive inhibitor**
**(B) Competitive inhibitor**
**(C) Coenzyme**
**(D) Activator**

**37. The enzymes are classified into**
**(A) Five groups**
**(B) Three groups**
**(C) Six groups**
**(D) Four groups**

**38. Non-proteinaceous part of holoenzyme is**
**(A) Prosthetic group**
**(B) Apoenzyme**
**(C) Tubulin**
**(D) None of these**

**39. Enymes are highly specific for a given substrate which is due to the shape of their**
**(A) Active site**
**(B) Allosteric site**
**(C) Non-competitive site**
**(D) None of these**

**40. The name enzyme was suggested in 1878 by the German physiologist**
**(A) Wilhelm Kuhne**
**(B) Koshland**
**(C) Fischer**
**(D) Paul Filder**

**41. Proteinaceous part of holoenzyme is**
**(A) Prosthetic group**
**(B) Apoenzyme**
**(C) Lecithin**
**(D) None of these**

**42. The "lock and key hypothesis" attempts to explain the mechanism of**
**(A) vacuole formation**
**(B) pinocytosis**
**(C) sharing of electrons**
**(D) enzyme specificity**

**43. An enzyme that hydrolyzes protein will not act upon starch. This fact is an indication that enzymes are**
**(A) hydrolytic**
**(B) specific**
**(C) catalytic**
**(D) synthetic**

**44. The site where enzyme catalyzed reaction takes place is called?**
**(A) Active site**
**(B) Allosteric site**
**(C) Denatures site**
**(D) Dead Site**

**45. What is a cofactor?**
**(A) Inorganic ions**
**(B) Organic molecules**
**(C) Both a and b**
**(D) None of the above**

**46. Mg+2 is an inorganic activator for the enzyme**
**(A) Phosophatase**
**(B) Carbonic anhydrase**
**(C) Enterokinase**
**(D) Amylase**

**47. Zn+2 is an inorganic activator for enzyme.**
**(A) Carbonic anhydrase**
**(B) Phosophatase**
**(C) Chymotrypsin**
**(D) Maltase**

**48. Which antibiotic blocks the active site of an enzyme that many bacteria used to make cell-walls.**
**(A) Amphotericin**
**(B) Gentamicin**
**(C) Penicillin**
**(D) Cephalosporin**

**49. DDT and Parathion are inhibitors of key enzymes in**
**(A) Nervous system**
**(B) Respiratory system**
**(C) Digestive system**
**(D) Circulatory system**

**50. At high temperature the rate of enzyme action decreases because the increased heat**
**(A) Changes the pH of the system**
**(B) Alters the active site of the enzyme**
**(C) Neutralize acids and bases in the system**
**(D) Increases the concentration of enzymes**

**51. Which of the following enzymes would digest a fat?**
**(A) sucrase**
**(B) protease**
**(C) Ligase**
**(D) lipase**

**52. In the Lock and Key model of enzyme action, the part of the enzyme that recognizes the substrate is known as the**
**(A) Enzyme-substrate complex**
**(B) Product**
**(C) Enzyme-product complex**
**(D) Active site**

**53. A certain enzyme will hydrolyze egg white but not starch. Which statement best explains this observation?**
**(A) Starch molecules are too large to be hydrolyzed**
**(B) Enzyme molecules are specific in their actions**
**(C) Egg white acts as a coenzyme for hydrolysis**
**(D) Starch is composed of amino acids.**

**54. At about 0 C, most enzymes are**
**(A) Inactive**
**(B) Active**
**(C) Destroyed**
**(D) Replicated**

**55. Vitamins are essential to the survival of organisms because vitamins usually function as**
**(A) Substrates**
**(B) Nucleic acids**
**(C) Co-enzymes**
**(D) Nucleosides**

**56. When a molecule binds to an area of an enzyme that is not the active site, and changes the shape of the enzyme so that it no longer can work, this is called**
**(A) denaturation**
**(B) competitive inhibition**
**(C) noncompetitive inhibition**
**(D) substrate delocation**

**57. What is a coenzyme?**
**(A) Inorganic ion**
**(B) Organic molecule**
**(C) Both A and B**
**(D) None of these**

58. Which of the following is true about Michaelis-Menten kinetics?
a) Km, the Michaelis constant, is defined as that concentration of substrate at which enzyme is working at maximum velocity
b) It describes single substrate enzymes
c) Km, the Michaelis constant is defined as the dissociation constant of the enzyme-substrate complex
d) It assumes covalent binding occurs between enzyme and substrate

59. When the velocity of enzyme activity is plotted against substrate concentration, which of the following is obtained?
a) Hyperbolic curve
b) Parabola
c) Straight line with positive slope
d) Straight line with negative slope

60. The rate determining step of Michaelis-Menten kinetics is \_\_\_\_\_\_\_\_\_\_
a) The complex dissociation step to produce products
b) The complex formation step
c) The product formation step
d) None of the mentioned

61. The molecule which acts directly on an enzyme to lower its catalytic rate is \_\_\_\_\_\_\_\_\_\_
a) Repressor
b) Inhibitor
c) Modulator
d) Regulator

62. Which of the following is an example for irreversible inhibitor?
a) Disulfiram
b) Oseltamivir
c) Protease inhibitors
d) DIPF

63. Which of the following is an example of reversible inhibitor?
a) DIPF
b) Penicillin
c) Iodoacetamide
d) Protease inhibitors

64. Where does inhibitor binds on enzyme in mixed inhibition?
a) At active site
b) Allosteric site
c) Does not bind on enzyme
d) Binds on substrate

65. The catalytic efficiency of two distinct enzymes can be compared based on which of the following factor?
a) Km
b) Product formation
c) Size of the enzymes
d) pH of optimum value

66. What is the general mechanism of an enzyme?
a) It acts by reducing the activation energy
b) It acts by increasing the activation energy
c) It acts by decreasing the pH
d) It acts by increasing the pH

**67. The control and regulation of biological processes involve some enzymes. They are known as**

(a) inhibitors

(b) regulators

(c) allosteric enzymes

(d) activators

**68. What are the non-substrate molecules binding to the allosteric sites called?**

(a) allosteric substrate

(b) reactants

(c) allosteric modulators

(d) inhibitors

**69. Allosteric enzymes are**

(a) smaller than simple enzymes

(b) larger than simple enzymes

(c) smaller than simple enzymes but not complex

(d) larger and more complex than simple enzyme

**70. Allosteric enzymes consist of several**

(a) polypeptide chains

(b) inhibitors

(c) temperature ranges

(d) active sites

**71. Allosteric enzymes possess**

(a) Three types of allosteric sites

(b) Active site and three types of allosteric sites

(c) Active site and two types of allosteric sites

(d) Active site and an allosteric site

**72. Enzymes that are involved in the feedback inhibition are known as**

(a) Apoenzymes

(b) Holoenzymes

(c) Allosteric enzymes

(d) Coenzymes

**73. Blocking of enzyme action by blocking its active sites is**

(a) feedback inhibition

(b) allosteric inhibition

(c) competitive inhibition

(d) non-competitive inhibition

**74. The “Lock and key” theory of enzyme action was put forward by**

(a) Koshland

(b) Fischer

(c) Kuhne

(d) Arrhenius

**75. The fastest enzyme is**

(a) carbonic anhydrase

(b) pepsin

(c) DNA polymerase

(d) DNA gyrase

**76. The allosteric enzymes on the top of active sites contain**

(a) substrate

(b) inhibitors

(c) polypeptide chains

(d) allosteric site

77. The selection of immobilization of cell or enzyme depends on

A: Number of step in the process

 B: Cost

 C: Stability and catalytic specificity

D: All of the above

78.Benefits of enzyme immobilization

 A: Cost effective

B: Smaller reactor

C: Shorter process time

 D: All of the above

79. For more complex reactions immobilized\_\_\_\_\_\_will be used

A: Cell

 B: Enzyme

 C: Both A and B

 D: None of the above

 80. Adsorption of cell or enzyme on supporting medium is due to

 A: Electrostatic force

 B: Hydrophobic interactions

 C: Bonding to specific ligand

 D: All of the above

 81.Which of the following polymer matrix is used for the entrapment?

A: Starch

 B: Carageenan

C: Polyethylene glycol

 D: Gluteraldehyde

82. In which of the technique enzyme and polymer are bridged by the use of bi-functional reagent

 A: Covalent cross-linking

B: Adsorption

C: Physical entrapment

 D: Microencapsulation

83.Low molecular weight compounds cannot be immobilize by

A: Adsorption

 B: Covalent cross-linking

C: Entrapment

 D: Microencapsulation

84.Which of the following multi-valent reagent used in covalent cross-linking?

A: Gluteraldehyde

B: Mercaptoethanol

 C: Bis-acrylamide

 D: Titanium IV

85. Immobilized enzyme or cells used in

 A: Diagnostics industry

B: Pharmaceutical industry

 C: Food industry

D: All of the above

 86. Which of the amino acid was produced by immobilized enzyme for the first time?

 A: L-amino acids

B: D-amino acids

C: D and L amino acids

D: None of the above

87. Salvage pathway is used in the synthesis of \_\_\_\_\_\_\_\_\_\_\_
a) Amino acid
b) Carbohydrate
c) Nucleotide
d) Fatty acid

88. All deoxyribonucleotide is synthesized by the ribonucleotides.
a) True
b) False

89. Name the precursor of RNA?
a) Glutamine
b) Cytidine
c) Orotidylate
d) Uridylate

90. The activity of which of the following enzyme is inhibited by the chemotherapeutic agent during deoxyribonucleotide synthesis?
a) Dihydrofolate reductase
b) Ribonucleotide reductase
c) Thymidylate synthase
d) CTP synthetase

91. Which of the following is not the precursor of a purine ring?
a) Glutamine
b) Lysine
c) Glycine
d) Aspartate

92. During purine synthesis the activity of amidotransferase enzyme is inhibited by the antitumor agent, mark the correct one.
a) Aminopterin
b) Methotrexate
c) Texol
d) Azaserine

93. Which of the following plants undergo CAM photosynthesis?
a) Cactus
b) Sugarcane
c) Corn
d) Wheat

94. The CAM pathway starts at daytime.
a) True
b) False

95. Where is the malate stored in CAM plants?
a) Chloroplast
b) Mitochondria
c) Vacuoles
d) Endoplasmic reticulum

96. How many aquatic plant genera can undergo CAM photosynthesis?
a) 4
b) 5
c) 6
d) 7

97. The CAM plants undergo daytime acidification and nighttime deacidification.
a) True
b) False

98. Which enzyme is used in converting bicarbonate ion to oxaloacetate?
a) Phosphoenolpyruvate reductase
b) Phosphoenolpyruvate hydrogenase
c) Phosphoenolpyruvate carboxylase
d) Phosphoenolpyruvate dehydrogenase

99. Which enzyme is used to convert oxaloacetate to malate?
a) Malate dehydrogenase
b) Malate hydrolase
c) Malate carboxylase
d) Malate dehydratase

100. How many molecules of ATP and NADPH2 are used in synthesis of one glucose molecule?
a) 30 ATP and 10 NADPH2
b) 10 ATP and 30 NADPH2
c) 30 ATP and 12 NADPH2
d) 12 ATP and 30 NADPH2

Answer Key

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1.C | 2.A | 3.D | 4.A | 5.B | 6.C | 7.C | 8.D | 9.A | 10.B |
| 11.A | 12.D | 13.C | 14.C | 15.B | 16.C | 17.C | 18.D | 19.D | 20.D |
| 21.D | 22.D | 23.D | 24.A | 25.B | 26.C | 27.A | 28.B | 29.B | 30.C |
| 31.A | 32.A | 33.B | 34.A | 35.C | 36.A | 37.A | 38.C | 39.A | 40.A |
| 41.B | 42.D | 43.B | 44.A | 45.C | 46.A | 47.A | 48.C | 49.A | 50.B |
| 51.D | 52.D | 53.B | 54.A | 55.C | 56.C | 57.B | 58.B | 59.A | 60.A |
| 61.B | 62.D | 63.D | 64.B | 65.A | 66.A | 67.C | 68.C | 69.D | 70.A |
| 71.D | 72.C | 73.C | 74.B | 75.A | 76.D | 77.D | 78.D | 79.A | 80.D |
| 81.B | 82.A | 83.D | 84.D | 85.D | 86.A | 87.C | 88.A | 89.D | 90.A |
| 91.B | 92.D | 93.A | 94.B | 95.C | 96.A | 97.B | 98.C | 99.A | 100.C |