**Question bank**

**Paper 1 enzymology Bsc IV sem**

1. Which of the following rule was not given by the enzyme commission?
a) Assigned each enzyme a name
b) Assigned each enzyme a 4-digit code
c) Divided enzymes into 6 main groups
d) Mention of cofactors

**Answer: d**

2.  Enzymes that catalyze the transfer of atom or group between two molecules is known as \_\_\_\_\_\_\_\_\_\_
a) oxidoreductases
b) transferases
c) ligases
d) isomerases

**Answer: b**

3. Pectinases belong to which class of enzyme?
a) Ligases
b) Hydrolases
c) Lyases
d) Transferases

**Answer: c**

4. Glycosidases, lipases and proteases belong to which class of enzymes?
a) Hydrolases
b) Ligases
c) Isomerases
d) Transferases

**Answer: a**

**5.**  Which of the following belongs to the class of isomerases?
a) Aldolases
b) Oxygenases
c) Epimerases
d) Esterases

**Answer: c**

6.  Which of the following is an example for Oxidoreductases?
a) Glucose oxidase
b) Glutathione synthetase
c) Aspartate aminotransferase
d) Histidase

**Answer: a**

7.  Which of the following is not true for acid base catalysis?
a) Bases catalyze the reaction by accepting a proton
b) Bases increases the reaction rate by increasing the nucleophilic character of the attacking group
c) To make reactants proximal to each other
d) Specific hydroxide ion catalysis of reaction in water is an example of this type of catalysis

**Answer: c**

8. Which of the following is not involved in covalent catalysis?
a) Bases which catalyze the reaction by accepting a proton
b) Electron rich nucleophilic function group of amino acid side chain
c) Electron deficient electrophilic portion of substrate
d) Acylated, phosphorylated or glycosylated enzyme nucleophile as covalent intermediate

**Answer: a**

**9.** Which of the following is not true for covalent catalysis?
a) A number of coenzymes for covalent adducts generating new electrophilic groups which can function as electron sink
b) These adduct forming coenzymes leads to increase in rate acceleration
c) About 100 enzymes show covalent intermediates during catalysis
d) Hydrolysis of acetyl imidazole is an example of this type of catalysis

**Answer: d**

10. Which of the following is not true for allosteric enzyme?
a) Greek word ‘allo’ means other and ‘steros’ means site
b) Enzymes having other site
c) Regulatory metabolites are called effector or modulator or modifier
d) Each of two or more enzymes with identical function but different structure

**Answer: d**

11. The enzymes having allosteric sites, other than catalytic site which is used for binding for regulatory metabolites is referred to as \_\_\_\_\_\_\_\_\_
a) isoenzyme
b) biosensor
c) allosteric enzymes
d) effectors

**Answer: c**

12. Effectors that inhibit enzyme activity are termed as \_\_\_\_\_\_\_\_\_\_\_\_
a) positive effectors
b) modulators
c) negative effectors
d) inhibitor

**Answer: c**

13. \_\_\_\_\_\_\_\_ is referred to as effectors which increase the enzyme activity.
a) Positive effectors
b) Modifier
c) Negative effectors
d) Inhibitor

**Answer: a**

14.  By what factor chymotrypsin enhances the rate of peptide bond hydrolysis?
a) 107
b) 108
c) At least 109
d) 106

**Answer: c**

15.  The active site of chymotrypsin consists of a catalytic triad of which of the following amino acid residues?
a) Serine, histidine and aspartate
b) Serine, histidine and glutamate
c) Threonine, histidine and aspartate
d) Methionine, histidine and aspartate

**Answer: a**

16. Which of the following statements are true about the reactions at the active center of chymotrypsin?
a) The aspartate residue gives an electron to histidine
b) The aspartate residue gives a proton to histidine
c) The aspartate residue keeps the histidine in the correct direction
d) A proton moves from the aspartate to serine to histidine in the catalytic triad of chymotrypsin

**Answer: c**

17. The polypeptide chains in chymotrypsin are linked by \_\_\_\_\_\_\_\_\_\_\_
a) Hydrogen bonds
b) Ionic bonds
c) Disulfide bond
d) SH-SH bond

**Answer: c**

18. Which of the following is false about chymotrypsin?
a) Hydrolytic cleavage of a peptide bond by chymotrypsin has two phases
b) It is activated in the presence of trypsin
c) It is synthesized in the thyroid gland
d) Polypeptide chains in chymotrypsin are linked by S-S bonds

 **Answer: c**

19. biotin is required for the activity of -------------------- ?

a) pyruvate carboxylase

b) lactate dehydrogenase

c) succinate thiokinase

d) phosphohexose isomerase

**Answer: a**

20. for most enzymes the optimum temperature is

a) 30 – 40 0 C

b) 40- 50 0 C

c) 40 – 45 0 C

d) 45 – 50 0 C

**Answer: c**

21. very low temperatures make the enzyme

a) hyperactive

b) freeze

c) dissolve in water

d) inactive

 **Answer: d**

 22. 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

**Answer: b**

23. 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

**Answer: a**

24 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

**Answer: a**

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

**Answer: b**

26.  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

**Answer: b**

27. . 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

**Answer: a**

28. 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

 **Answer: a**

29. **A competitive inhibitor of an enzyme is usually**

1. a highly reactive compound
2. a metal ion such as Hg2+ or Pb2+
3. structurally similar to the substrate.
4. water insoluble

 **Answer: c**

**30. The types of inhibition pattern based on Michaelis Menten equation are**

1. competitive
2. non-competitive
3. uncompetitive
4. all of the above

**Answer: d**

31. **The rate-determining step of Michaelis Menten kinetics is**

1. the complex formation step
2. the complex dissociation step to produce product
3. the product formation step
4. Both (a)and(c)

 **Answer: b**

32. **The effect of non-competitive inhibition on a Lineweaver-Burk Plot is that**

1. it can move the entire curve to the right
2. it can change the y-intercept
3. it can change the x-intercept
4. all of these

 **Answer: b**

33. **The conformational change in an enzyme after the substrate is bound that allows the chemical reaction to proceed, can be explained by**

1. induced fit
2. transition
3. fit and fine
4. Pasteur

**Answer: a**

34. Non competitive inhibitor of an enzyme catalyzed reaction

1. Decreased Vmax
2. Binds to Michaelis complex ( ES)
3. Both (a) and (b)
4. can actually increase reaction velocity in rare cases

**Answer: c**

**35. The enzyme inhibition can occur by**

1. reversible inhibitors
2. irreversible inhibitors
3. Both (a) and (b)
4. None of these

**Answer: c**

36. Enzymes can be isolated from cell free extract by which one of the following methods?
a) Osmotic shock
b) Alkali treatment
c) Factors like pH, temperature and low ionic strength
d) Ultrasonication

 **Answer: c**

 37.  Which of the following is the best method for isolating enzymes from cell free extract?
a) pH treatment
b) Temperature treatment
c) Chemical treatment
d) Osmotic shock

**Answer: c**

 38. Which one if the chemicals is not used to isolate enzymes from cell free extract?
a) 1.4% buffered sucrose
b) Cetyl trimethyl ammonium bromide
c) Nucleases
d) Streptomycin sulphate

 **Answer: a**

39. Which of the following methods cannot be used to isolate enzymes from cell free extract?
a) Use of factors like pH and ionic strength
b) Use of chemicals
c) Homogenization
d) Use of temperature factor

**Answer: c**

40. which of the following is produced with the combination of apoenzyme and coenzyme

a) holoenzyme

b) enzyme substrate complex

c) prosthetic group

d) enzyme product complex

 **Answer: a**