Biochemistry Final Exam 2nd Semester 2019/2020

One; Choose ONE best answer

1. The __ of a double reciprocal plot equals __ and the __ equals_ .

Select one:

- a) slope, VMAX, y-intercept, KM.
- b) slope, KM, y-intercept, 1/VMAX.
- **c) slope, KM/VMAX, y-intercept, VMAX/1.**
- d) slope, KM/VMAX, y-intercept, VMAX.
- e) slope, KM/VMAX, x-intercept, VMAX.

2. The relationship between Vo and [S] of a single binding site is explained in which equation?

Select one:

- a) Hill equation
- **b) Michaelis-Menten equation**
- c) Velocity equation
- d) [S] equation

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

Select one:

- a) competitive
- b) non-competitive
- c) uncompetitive
- **d) all of the above**

4. A structure that has hydrogen bonds between polypeptide chains arranged side by side is

Select one:

- a) Tertiary structure
- **b) β-pleated sheets**
- c) α-helix
- d) Primary structure

5. A glycoside is formed by attaching the sugar to another molecule at a

Select one:

- a) nitrogen atom (N-glycosidic linkage).
- b) oxygen atom (O-glycosidic linkage).
- **c) either (a) or (b).**
- d) neither (a) nor (b).

6. The main bonding in the secondary structure of a protein is due to.....

Select one:

- **a) hydrogen bonding**
- b) polar bonding
- c) covalent bonding
- d) ionic bonding

7. A molecule with polar covalent bonds would

Select one:

- **a) Be soluble in water.**
- b) Not be soluble in water
- c) Contain atoms with very similar electronegativity.
- d) Both b and c are correct

8. Inulin is

Select one:

a) a glucosan
b) formed by liver cells.
c) used to measure glomerular filtration rate.
d) all the above.

9. The following is not a phospholipid

Select one:

a) Sphingomyelin
b) Lecithin
c) Cephalin
d) **Cerebroside**

10. Which of the following is an example of unsaturated fatty acids?

Select one:

a) Lauric
b) Linoleic
c) Palmitic
d) Myristic

11. In competitive inhibition a factor is obtained from the measurement of

Select one:

a) Vmax
b) KM
c) Y-intercept in Lineweaver-Burk Plot
d) None of these

12. Hydrolysis of fats by alkalies into fatty acids and glycerol is called

Select one:

a) Coagulation
b) Saponification
c) Suspension
d) Colloidal

13. Which of the following statements is true about competitive inhibitors?

Select one:

a) It is a common type of irreversible inhibition
b) The apparent Km increases in the presence of inhibitor
c) The apparent Km decreases in the presence of inhibitor
d) The maximum velocity for the reaction decreases in the presence of a competitive inhibitor

14. Given an enzyme with a Km = 10m M and Vmax = 100 m mol/min. If [S] = 100 m M, which of the following will be true?

Select one:

a) A 10-fold increase in Vmax would increase velocity 10-fold y
b) A 10-fold decrease in Km would increase velocity
c) Both (a) and (b)

d) A 10-fold increase in Vmax would decrease velocity 20-fold

15. Most important reason for the unusual properties of water is:

Select one:

a) The covalent bonding pattern in water molecule

b) The bond angle between the two hydrogen atoms in water

c) Hydrogen bonding between water molecules

d) Water can be immediately ionized at room temperature

16. Enzymes

Select one:

a) Do not require activation energy

b) Do not change requirement of activation energy

c) Increase requirement of activation energy

d) Lowest requirement of activation energy

17. Blocking of enzyme action by blocking its active sites is

Select one:

a) allosteric inhibition

b) feedback inhibition

c) competitive inhibition

d) non-competitive inhibition

18. Lactose

Select one:

a) is the disaccharide synthesized by sweet plant roots

b) is a galactoside.

c) is fermented by yeast enzymes.

d) is present in only alpha and not beta form.

19. Which of the statements regarding enzymes is false?

Select one:

a) Enzymes are proteins that function as catalysts.

b) Enzymes are specific.

c) Enzymes provide activation energy for reactions.

d) Enzyme activity can be regulated.

e) Enzymes may be used many times for a specific reaction.

20. Which type of inhibitor "poisons" an enzyme?

Select one:

a) Non-competitive inhibitor

b) Competitive inhibitor

c) Tightly bound inhibitor

d) Irreversible inhibitor

21. The transition state of a catalyzed reaction is

Select one:

a) a highly-populated intermediate on the reaction pathway.

b) higher in energy than that of an uncatalyzed reaction.

c) lower in energy than that of an uncatalyzed reaction.

d) lower in energy than the reaction substrate.

e) bound very weakly to the catalyst.

22. In the alpha helix the hydrogen bonds:

Select one:

a) occurs only between some of the amino acids of the helix

b) is roughly perpendicular to the axis of the helix.

c) is roughly parallel to the axis of the helix

d) occurs mainly between electronegative atoms of the R groups.

23. Which component is found in all sphingolipids?

Select one:

a) a carbohydrate

b) a negative charge

c) a phosphate group

d) an amino alcohol

24. Which of the following is a characteristic of both triacylglycerols and glycerophospholipids?

Select one:

a) Both contain carboxyl groups and are amphipathic

b) Both contain fatty acids and are saponifiable.

c) Both contain glycerol and ether bonds.

d) Both can be negatively charged at cellular pH.

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

Select one:

a) it can move the entire curve to the right

b) it can change the y-intercept

c) it can change the x-intercept

d) all of these

26. Glycogen

Select one:

a) is formed by 1-4 glucosidic bonds only.

b) is reducing.

c) gives pink color with iodine.

d) all the above.

27. A competitive inhibitor of an enzyme is usually

Select one:

a) a highly reactive compound

b) a metal ion such as Hg2+ or Pb2+

c) structurally similar to the substrate.

d) water insoluble

28. Which would be a property of all the major types of lipids in this membrane?

Select one:

a) They would be saponifiable in base and hydrolyzed in acid.

b) They would have polar heads and non-polar tails.

c) They would be composed of five-carbon units.

d) They would be joined to each other through covalent bonds.

29. Which of the following is more commonly called phosphatidic acid?

a) Diacylglycerol 3-phosphate

b) Fatty acyl co-A

c) L-glycerol 3-phosphate

d) L-glycerol 2-phosphate

30. Biological steroid derived from cholesterol is

a) Clenbuterol

b) Cortisol

c) Winstrol

d) Dianabol

31. Find the INCORRECT statement about the biological functions of lipids

a) Storage form of metabolic fuel

b) Have a protective function in bacteria, plant, and insects

c) The structural component of membranes

d) Exhibit increased catalytic activity

32. For which out of the following compounds cholesterol does not serve as a precursor?

a) Bile pigments

b) Bile salts

c) Vitamin D

d) Sex hormones

33. What are the components of a Galactocerebroside?

a) Sphingosine+ fatty acid+ Galactose

b) Glycerol +Fatty acids +Phosphoric acid+ Galactose

c) Glycerol +Fatty acids +Phosphoric acid +Nitrogenous base+ Galactose

d) Sphingosine+ fatty acids +Phosphoric acid+ Galactose

34. Glycosphingolipids are a combination of

a) Ceramide with one or more sugar residues

b) Sphingosine with galactose

c) Glycerol with galactose

d) Sphingosine with phosphoric acid

35. Myelin is the lipid-rich membrane sheath; it has a particularly high content of

a) Sphingomyelin

b) Glucocerebroside

c) Ganglioside

d) Cholesterol

36. Cerebrosides are composed of

a) Sphingosine, fatty acids, glycerol and phosphoric acid

b) Glycerol, fatty acids, galactose

c) Sphingosine, fatty acids, galactose

d) Glycerol, fatty acids, galactose, sphingol

37. What is the chemical difference between cellulose and chitin?

a) Replacement of the hydroxyl group at C2 with an acetylated amino group

b) Replacement of the hydroxyl group at C3 with an acetylated amino group

c) Replacement of the hydroxyl group at C4 with an acetylated amino group

d) Replacement of the hydroxyl group at C5 with an acetylated amino group

38. When all the monosaccharides in a polysaccharide are same type, such type of a polysaccharide is called

a) Glycogen

b) Homoglycan

c) Heteroglycan

d) Oligosaccharide

39. Which of the following statements about starch and glycogen is false?

a) Amylose is unbranched; amylopectin and glycogen contain many (α1,6) branches

b) Both are homopolymers of glucose

c) Both serve primarily as structural elements in cell walls

d) Both starch and glycogen are stored intracellularly as insoluble granules

40. Chitin is a polymer of:

a) N-acetyl-α-D-glucosamine

b) N-acetyl-α-D-gluctosamine

c) N-acetyl-β-D-glucosamine

d) N-acetyl-β-D-gluctosamine

41. The reactivity of blood group A is confirmed by detecting the presence of which immunodominant sugar molecule?

a) N-acetyl-D-neuraminic acid

b) L-fucose

c) N-acetyl-D-galactosamine

d) N-acetyl-D-glucosamine

42. The reactivity of blood group B is confirmed by detecting the presence of which immunodominant sugar molecule?

a) N-acetyl-D-neuraminic acid

b) L-fucose

c) N-acetyl-D-galactosamine

d) α-D-galactose

43. What makes cellulose different from starch?

a) Starch is produced by plant cells, and cellulose is produced by animal cells.

b) Cellulose forms long filaments, and starch is highly branched.

c) Starch is insoluble, and cellulose is soluble.

d) All of the choices are correct.

44. Two monosaccharides combine to form disaccharides or polysaccharides. This involves the OH group of one monosaccharide forming an ester linkage with the anomeric carbon of the second monosaccharide. This type of bond is called:

a) N-glycosidic bond

b) Glycoside

c) O-glycosidic bond

d) Branching

45. Which of the following statements is false?

a) Primary structure of a protein determines how it folds up into a unique three-dimensional structure

b) Secondary structure of a protein determines how it folds up into a unique three-dimensional structure

c) Three-dimensional structure of a protein determines the function of a protein

d) Amino acid sequence is absolutely invariant for a particular protein

46. Water (H_2O) has a bent shape, resulting in an unequal distribution of the electrons. Oxygen, which is more electronegative than the hydrogen's, has a greater pull on the electrons, giving the oxygen a partial negative charge and the hydrogen's a partial positive charge. This unequal distribution is called a

a) Covalent bond

b) Tail

c) Bent geometry

d) Dipole

47. The addition of a phosphoryl group to a OH group of a sugar by a kinase is a form of:

a) Dehydrogenation

b) Reduction

c) Oxidation

d) Esterification

48. All of the following are true about Phenylketonuria (PKU) except:

a) Referred to as inborn errors of metabolism

b) A diet high in phenylalanine and high in tyrosine recommended.

c) The gene that converts phenylalanine to tyrosine is defective

d) Phenylalanine hydroxylase enzyme defective

49. Most important reason for the unusual properties of water is:

a) The covalent bonding pattern in water molecule

b) The bond angle between the two hydrogen atoms in water

c) Hydrogen bonding between water molecules

d) Water can be immediately ionized at room temperature

50. Polar molecules can readily dissolve in water. This is because:

a) Polar molecules can form hydrogen bonds with water

b) Polar molecules can replace water-water interaction with more energetically favorable water- solute interactions

c) Polar charged water can interact with the charge of polar molecules

d) All polar molecules are amphipathic in nature