

Biochemistry Mid Questions 2023

1. Which of the following is true about the isoelectric point of Arginine?

- a) Is reached after adding 1.5 equivalents of a base
- b) Is reached after the first step of titration
- c) Equals approximately 10.5
- d) Equals approximately 5.5

Answer: C

2. Which of the following is the reason that makes glycosaminoglycans (GAGs) act as shock absorbers?

- a) The negative charge on the constituent monosaccharides
- b) Their high concentration in the extracellular matrix

Answer: A

3. 100 mmol of an unknown amino acid at $pH=0.5$ was completely titrated by adding 200 mmol of KOH, what is the unknown amino acid?

- a) Glutamate
- b) Methionine
- c) Lysine
- d) Cysteine

Answer: B

4. Phosphatidate is the backbone of?

- a) Lecithin
- b) galactocerebroside
- c) Globoside
- d) Glycerophospholipid

Answer: A

5. What is common between the plasmid of bacteria and mitochondrial DNA?

- a) Both are circular
- b) They make all the proteins in the cell
- c) They can transfer among cells

Answer; A

6. Which of the following is the sequence of the complementary strand of the following DNA strand: ACGTAGCT ?

- a) TGCATCGA

b) AGCTACGT

Answer: B

7. What are the main attraction forces which happen between nonpolar molecules?

- a) Hydrophobic interactions
- b) Van der Waals interactions

Answer: A

8. Why are Lecithin and bile acid great emulsifiers?

- a) They are charged
- b) They are amphoteric
- c) They are amphipathic

Answer: C

9. Which of the following increases the fluidity of the plasma membrane?

- a) The presence of unsaturated fatty acids
- b) The presence of cholesterol

Answer: A

10. Which of the following is derived from Phenylalanine?

Answer: Tyrosine

11. Which of the following is the storage form of fatty acids?

Answer: Triacylglycerol

12. Which of the following share the same omega number?

Answer: Linoleate and arachidonate

13. The purine and pyrimidine are bound at.....of the pentose sugar via.....linkage?

Answer: C1, glycosidic

14. Which of the following is the way of compensation for asthma?

- a) Reabsorption of HCO_3^- ions
- b) Inhibition of the production of ketone bodies

- c) Excretion of HCO_3^- ions

Answer: A

15. Sorbitol can be obtained from which of the following?

- a) Oxidized glucose
b) Reduced fructose

Answer: B

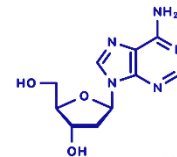
16. Which isn't true about K_a ?

- a) Increasing K_a means stronger acid
b) Strong acids have K_a
c) We need 1 eq of OH^- to reach the point of $\text{p}K_a$ in titration
d) K_a is positively correlated with the concentration of H_3O^+ and OH^-
e) Weaker acids have higher $\text{p}K_a$

Answer: C

17. What is the name of the following structure?

- a) Deoxyadenosine
b) Deoxyadenylate
c) Deoxycytidine



Answer: A

18. What is the relationship between alpha Galactose and beta Galactose?

- a) Epimers
b) Anomers

Answer: B

19. What do triglycerides and glycerophospholipids share?

- a) 3 chains of fatty acids
b) Both have charged groups
c) The same backbone
d) Both have phosphate

Answer: C

20. The pH in tomato juice is 4.5 ,what is the $[\text{OH}^-]$?

Answer: $10^{-9.5}$

21. Serotonin and Melatonin are derivatives of?

Answer: Tryptophan

22. Which group contains only hydrophilic amino acids?

Answer: Tyr, Ser, Thr

23. Cholesterol is the precursor of all the following except?

Answer: Thromboxane

24. Which of the following has an N-glycosidic bond?

- a) ATP
- b) N-acetylglucosamine

Answer: A

25. Glycogen and Amylose differ in?

Answer: the presence of branching

26. Which of the following has a secondary amine?

Answer: Proline

27. What is a characteristic of water?

Answer: Amphoteric

28. Which is the most efficient buffer?

Answer: Bicarbonate buffer

29. Which of the following is true regarding wax?

Answer: Long hydrocarbon chain

30. In a solution of 0.25 M NaH_2PO_4 and 0.35 M Na_2HPO_4 , 0.05 M of HCl was added, calculate the pH. (pK_a is 7.2)

Answer: 7.2

31. The immediate precursor of eicosanoids?

Answer: Arachidonic acid

32. A hypothetical amino acid with a positively charged R group and $\text{pK}_a=12$, what is the charge at $\text{pH}=4$?

- a) +2
- b) +1

c) 0

Answer: B

33. Titration of 40ml H_3PO_4 and has a Molarity of 0.3, with 150ml of KOH, what is the Molarity of KOH?

a) 8M

b) 0.08M

c) 80M

d) We can't titrate a weak acid with a strong base.

Answer: B