Biochem Midterm – Batch of 019

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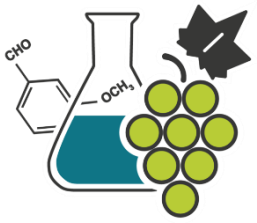


1- Which of the following peptides can be a part of an alpha helix?

a- Gln, Arg, Lys, Leu, Tyr
b- Cys, Lys, Glu, Ala, Thr
c- Val, Ile, Asn, Lys, Phe
d- Trp, Gly, Gln, Cys, Trp
e- Gln, Pro, Ala, Asp, Ile

2- Calculate the normality of a solution that contains 5g of H3A acid in 2000 ml of solution. (molecular weight is 25)

a- 3.0
b- 0.50
c- 7.5
d- 0.30
e- 0.0003

3- Gluconate is oxidized on carbon number:

a- 2 and 6
b- 1 and 6
c- 1
d- 2
e- 6

4- Secondary structure elements combine to form a _____ in proteins.

a- Native protein
b- Simple protein
c- Domain
d- Motif
e- Chaperone

5- Protein tertiary structure involves all of the following EXCEPT:

a- Functionality
b- Combination of several subunits
c- Interactions between R- groups
d- The addition of prosthetic groups
e- Combination of domains

6- The following statement is CORRECT regarding the equivalence point of a titration curve:

a- The solution cannot act as a buffer.
b- 70% of titration is finished.
c- pH equals 7.
d- pH equals pKa.
e- the curve is in plateau phase.

7- If a 10 mmoles of KOH were dissolved in 10 liters of water. The pH of the solution will be:

a- 12
b- 3
c- 2
d- 10
e- 11

8- _____ has/have all of the information necessary for determining the tree-dimensional shape of a protein.

a- The protein's peptide bonds.
b- The protein's interaction with molecular chaperones.
c- The prosthetic group.
d- The protein's interactions with other polypeptides.
e- The proteins amino acid sequence.

9- Which of the following is a secondary amine?

a- Gly
b- Gln
c- Glu
d- Cys
e- Pro

10- Which of the following is not a conjugate acid-base pair?

a- NH4+/ NH3
b- H3O+/ H2O
c- H2O/ OH-
d- H2SO4-2/HSO4-1
e- CH3-CH3/ CH3-CH2

11- When does the zwitterionic form of Glu form during titration?

a- After the second step of titration
b- In the middle of the first step of titration
c- After the third step of titration
d- After the first step of titration
e- In the middle of the second step of titration

12- How many equivalents of phosphoric acid are contained in 300ml of 3.00 M phosphoric acid?

a- 1.80 eq
b- 0.90 eq
c- 9.00 eq
d- 3.60 eq
e- 2.70 eq

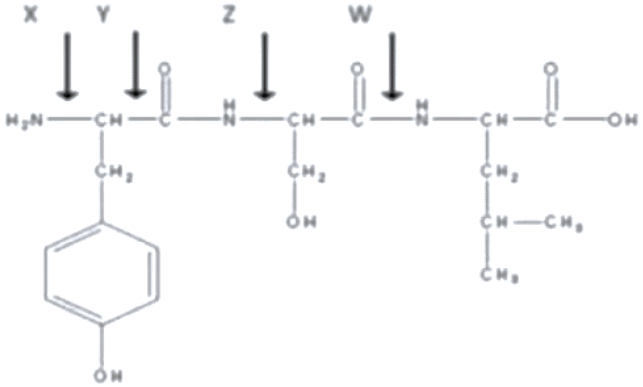
13- You bought a packet of vegetarian jelly. In the ingredients list, the manufacturer used a gelling agent that has the following characteristic, it _____.

a- Is a heteropolysaccharide of glucose and galactose.
b- Has five membered ring residues.
c- Is a polymer of N-acetyl glucose amine.
d- Is present in exoskeleton.
e- Contains modified galactose residues.

14- Vasopressin can be described as follows:

a- It is an antioxidant.
b- It is an artificial sweetener.
c- It can form a cyclic structure.
d- It has D-amino acids.
e- It is a natural pain killer.

15- Refer to the figure. Which of the following is TRUE about this peptide?



a- This peptide is a pentapeptide.
b- Bond Z is stronger than bond W.
c- Ala is on the N-terminus and Lys is on the C-terminus.
d- Alpha carbon contributes to bond Z.
e- This peptide has a total positive charge at the physiological pH.

16- Which of the following is TRUE about D and L forms of a compound?

a- Only L amino acids are found human proteins.
b- D isomers have less steric hindrance than L isomers.
c- D and L compounds differ in the anomeric carbon.
d- D and L compounds differ only in the last chiral center.
e- L sugars are predominant in nature.

17- Glycosaminoglycans are made of:

a- Repeated hetero-disaccharides derived from amino sugars and fructose.
b- Repeated homo-disaccharides derived from galactose.
c- Repeated hetero-disaccharides derived from glucose and peptides.
d- Repeated hetero-disaccharides derived from glucose and galactose.
e- Repeated hetero-disaccharides derived from glucose and fructose.

18- In a hospital laboratory a 5 mL sample of gastric HCl juice, obtained several hours after a meal, was titrated with 1 M NaOH to neutrality; 50 mL of NaOH was required. Assuming that no buffers were present, what was the pH of the gastric juice before titration?

a- 2.10
b- 1.05
c- 3.10
d- 1.55
e- 1.00

19- Arrange the following fatty acids depending on the number of double bonds they have (from the highest until zero). Arachidonic acid, Linoleic acid, Stearic acid, Linolenic acid.

a- Arachidonic acid, linolenic acid, linoleic acid, stearic acid
b- Linoleic acid, linolenic acid, stearic acid, arachidonic acid
c- Stearic acid, linoleic acid, linolenic acid, arachidonic acid
d- Linolenic acid, stearic acid, arachidonic acid, linoleic acid
e- Linoleic acid, stearic acid, arachidonic acid, linolenic acid

20- The polysaccharide type that excess glucose is stored in has the following characteristic:

a- It is a polysaccharide cross linked by peptide.
b- It cannot be digested because of the lack of the digestive enzyme in humans' intestine.
c- It is broken down by enzymes to maltose and glucose.
d- Its monomers are connected by beta linkages.
e- It is unbranched for better mechanical properties.

21- Fats contain triacylglycerols with more:

a- Saturated fatty acids
b- Phosphate groups
c- Unsaturated fatty acids
d- Cis fatty acids
e- Sphingosine

22- The noncovalent interactions that mainly induce liposome formation are:

a- Electrostatic interactions between lipids and water
b- Hydrophobic interactions between lipids and water
c- Hydrophobic interactions between lipid molecules
d- Hydrogen bond formation between lipids and water
e- Hydrogen bond formation between lipids molecules

23- Which of the following buffer systems is exclusively intracellular?

a- All biological buffers act at the same capacity level.
b- Phosphate buffer system
c- Hemoglobin buffer system
d- Protein buffer system
e- Bicarbonate buffer system

24- Asthma patients are treated with drugs that reduce the synthesis of compounds that can be described as follows:

a- Linolenic acid derivatives that have cyclic ether structures
b- Arachidic acid derivatives that have 5-membered ring structure.
c- Linoleic acid derivatives that inhibit platelet aggregation
d- Palmitic acid derivatives that constrict airways smooth muscles
e- Arachidonic acid derivatives that have 3 conjugated double bonds

25- Which of the following conditions can increase membrane fluidity?

a- More phospholipids with saturated fatty acids
b- Decreasing membrane cholesterol concentration
c- Reducing temperature (hypothermia)
d- Increasing membrane cholesterol concentration
e- More sphingolipids with saturated fatty acids

26- Which of the following amino acid is polar uncharged?

a- Arg
b- Leu
c- Phe
d- Tyr
e- Met

27- Which of the following is a correct match between product and precursor amino acid?

a- Epinephrine, Tyr
b- Dopa, Thr
c- Serotonin, Arg
d- GABA, Gln
e- NO, Gly

28- The following sugar has a beta linkage:

a- Galactose
b- Cellulose
c- Glycogen
d- Amylopectin
e- Sucrose

29- All of the following properties of buffer solutions are correct EXCEPT:

a- When pH = pKa, the buffer solution has equal amounts of the acid and its conjugate base
b- Polyprotic acids have multiple buffering capacities at different pH ranges.
c- A maximum buffer capacity is obtained when the pH = +/- 1 of its pKa
d- The pKa of the acid stays the same no matter what pH is.
e- Concentrations of the used weak acid or base to prepare a buffer solution is lower than its salt.

30- The lipid molecule that is destructed in multiple sclerosis is characterized by:

a- Is found exclusively in inner mitochondrial membrane.
b- Is found mainly in the nuclear envelope.
c- Has an inositol.
d- Is the form in which lipids are stored in the adipose tissue.
e- Has a phosphate group.

31- An amide group is present in the side chain of the following amino acid:

a- Thr
b- Cys
c- Asn
d- Glu
e- Ile

32- Which of the following is a reducing sugar?

a- Sucrose
b- Amylopectin
c- Cellulose
d- Amylose
e- Galactose

33- The total charge on Val at pH 1 is:

a- +1
b- -2
c- -1
d- +2
e- 0

34- The following fatty acid is an example on omega 3 fatty acids:

a- Linolenic acid
b- Palmitic acid
c- Oleic acid
d- Arachidonic acid
e- Linoleic acid

35- A ketose can form hydrogen bonds with the same type of molecules, but a ketone cannot because:

a- The ketose has only hydrogen bond acceptors.
b- The ketose has hydrogen donors and acceptors.
c- The ketone cannot be oxidized.
d- The ketone does not have a carbonyl carbon.
e- The ketone is more soluble in water than the ketose.

36- Cholesterol can be used to synthesize:

a- Lecithin
b- Cardiolipin
c- Parathyroid hormone
d- Vitamin A
e- Vitamin D

37- The amino acid that makes proteins act as buffers at physiological pH is:

a- Glu
b- Asn
c- Arg
d- His
e- Asp

38- A patient has undergone surgery that required the removal of the content of his upper gastrointestinal tract. After surgery, his blood pH was 7.60, HCO3- was 50 mM and PCO2 was 52 mmHg. We can describe his situation as:

a- Metabolic acidosis
b- Respiratory alkalosis
c- Metabolic alkalosis
d- Respiratory acidosis
e- His blood pH is normal.

39- Secondary structures are held by:

a- Covalent bonds between cysteine residues
b- Non-covalent interactions between backbone atoms
c- Peptide bonds
d- Prosthetic groups such as sugars, heme groups, metal ions ...etc.
e- Non-covalent interactions between R atoms

40- An either bond is found in:

a- Lecithin
b- Phosphatidyl serine
c- Phosphatidic acid
d- Plasmalogen
e- Sphingomyelin

Good luck ☺!

♥ Answers:

1	2	3	4	5	6	7	8	9	10
B	D	C	C	B	A	E	E	E	E
11	12	13	14	15	16	17	18	19	20
D	E	E	C	D	A	D	E	A	C
21	22	23	24	25	26	27	28	29	30
A	B	B	E	B	D	A	B	E	E
31	32	33	34	35	36	37	38	39	40
C	E	A	A	B	E	D	C	B	D

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أعذرونا إن وجدتم أي خطأ فقد جل من لا يسهو..

بالتوفيق 🙏💙💙

اللهم إني أستودعك ما قرأت و ما حفظت و ما تعلمت، فرده عند حاجتي إليه، إنك على كل شيء قدير، حسبنا الله و نعم الوكيل💙