MCQs in biochemistry(1)

✧ These questions were written to help you practice your study effectively and have a good background about your biochemistry exam which in turn helps you to get the wanted marks.

1st part : Midterm exam .

Q1)Which statement out of the following is NOT true about covalent bonds ?

A. Covalent bonds are considered to be the strongest bonds that are present in biochemicals .
B. A covalent bond can form between atoms of the same element.
C. Only a single covalent bond can form between two atoms.
D. A covalent bond results from the sharing of electrons by two atoms.
E. A covalent bond can form between atoms of different elements.

Answer : C

Q2)A molecule with six shared electrons would have _____ covalent bond(s):

A. One .
B. Two.
C. Three.
D. Four.
E. Six .

Answer : C

Q3)Which of the following statements about ionic compounds is FALSE?

A. Ionic bonds form because opposite charges attract one another.
B. Ionic compounds have a crystalline lattice structure.
C. Ionic compounds are electrically neutral .
D. Ionic compounds are described as good conductors
E. Compounds with ionic bonds tend to have low melting points.

Answer : E

Q4)Which of the following statements would best characterize a nonpolar covalent bond?

A. The atoms involved include a metal and a nonmetal .
B. The electronegativity values of the atoms are similar.

C. The molecular shape is always linear.
D. The molecule is capable of hydrogen bonding .
E. B and C .

Answer : B

Q5)Which of the following bonds is(are) responsible for most of reversible interactions of biochemicals :

A. Hydrogen bonds .
B. Ionic bonds .
C. Metallic bonds .
D. Van der waals interactions .
E. A,B and D .

Answer : E

Q6)The interactions between nonpolar molecules in water are called :

A. Hydrogen bonds.
B. Hydrophobic interactions .
C. Ionic interactions .
D. Hydrophilic interactions .
E. A and B .

Answer : B

Q7)One out of the following statements is INCORRECT about hydrogen bonds :

A. Hydrogen bonds are weak in comparison to covalent bonds .
B. Hydrogen bonds in ice and water are unaffected by melting and boiling .
C. Hydrogen bonds require a high input of energy in order to break the bonds between molecules .
D. Hydrogen bonds have a vital involvement in stabilizing the three dimensional structure of proteins.
E. None of the above

Answer : B

Q8)A biologically useful definition of a base is :

A. A molecule that acts as a proton (H+) acceptor.
B. A molecule that forms micelles in water .
C. A molecule that has both positive and negative ends .
D. A molecule that acts as a proton (H+) donor .
E. All of the above .

Answer : A

Q9) Which of the following statements regarding acids and bases is correct :

A. Acids increase the pH, and bases decrease the pH.
B. Acids increase the proportion of hydrogen ions (H+), and bases reduce the proportion of H+.
C. Acids combine with bases to form buffers.
D. Acids combine with bases to form salts
E. B and D

Answer : E

Q10)Which of the following is NOT an example of a weak acid?

A. Lactic acid .
B. Carbonic acid .
C. Sulfuric acid .
D. Pyruvic acid .

Answer : C

Q11)A buffer solution comprises which of the following?

A. A weak acid in solution .
B. A strong acid in solution .
C. A weak base in solution .
D. A weak acid and its conjugate base in solution .
F. None of the above .

Answer : D

Q12)Methyl orange in acidic solution is:

A. Colorless .
B. Red colored .
C. Yellow colored .
D. Pink colored .
E. Doesn't change .

Answer : B

Q13)Process in which acids (H^+) and bases (OH^-) react to form salts and water is called :

A. Neutralization
B. Hydrogenation
C. Halogenation
D. Sublimation

Answer : A

Q14)Which of the following acids is commonly found in sour milk, sour cream, yogurt, and cottage cheese :

A. Malic Acid .
B. Citric Acid .
C. Acetic Acid .
D. Lactic Acid .
E. Butyric Acid .

Answer : D

Q15)Which one out of the following functional groups is found in all organic acids :

A. Carboxyl Group .
B. Aldehyde Group .
C. Carbonyl Group .
D. Amide Group .

Answer : A

Q16)Out of these elements , which one is considered to have the highest electronegativity value :

A. Nitrogen .
B. Oxygen .
C. Sulfur .
D. Hydrogen .
E. Carbon .

Answer : B

Q17)Phenolphthalein in basic solution is :

A. Purple Colored .
B. Pink Colored .
C. Colorless .
D. Blue Colored .

Answer : A

Q18)One of the following bases helps in neutralization of stomach acid (HCl) effectively :

A . Mg(OH)2 .

B. KOH .

C. NaOH .

D. Ca(OH)2 .

E. LiOH .

Answer : A

Q19)A hydrogen bond donor is typically :

A. Weakly electronegative atom covalently bonded to a hydrogen.

B. Highly electronegative atom covalently bonded to a hydrogen.

C. Weakly electronegative atom with an unshared pair of electrons.

D. Highly electronegative atom with an unshared pair of electrons.

E. None of the above .

Answer : B

Q20)Which of the following statements is true about buffer solutions :

A. They maintain a relatively constant pH when either acids or bases are added to them .

B. They are found only in living systems and biological fluids.

C. Buffers are substances that help resist shifts in pH by releasing H+to a solution when acids are added .

D. Buffers are substances that help resist shifts in pH by both donating to a solution when bases are added, and accepting H+ when acids are added.

E. A and D

Answer : E

Q21)Normal pH of the blood is :

A. 7.4

B. 7.2

C. 7.0

D. 7.3

Answer : A

Q22)The polarity of water molecule is due to :

A. Difference in electronegativity between H and O in water molecule .

B. The readily ionizing behaviour of water .

C. The positive charge of water molecule .

D. The linear geometry of water molecule .

Answer : A

Q23)The water level in the human body is regulated by the hormone :

A. ACTH .

B. Oxytocin.

C. FSH .

D. Epinephrine .

Answer : B

Q24)Quantitatively, the most significant buffer system in plasma is:

A. Phosphate buffer system .

B. Carbonic acid-bicarbonate buffer system.

C. Lactic acid-lactate buffer system .

D. Protein buffer system.

E. haemoglobin buffer.

Answer : B

Q25)Concentration of the following is higher in intracellular fluid than in extracellular fluid:

A. Sodium .

B. Potassium .

C. Chloride .

D. Bicarbonate .

E. Calcium .

Answer : B

Q26)Relating to Antidiuretic Hormone which of the following statements is correct :

A. It is secreted by hypothalamus .

B. Secretion is increased when osmolality of plasma decreases

C. Increased obligatory reabsorption of water .

D. Acts on distal convoluted tubules and collecting ducts .

E. It is secreted in the pancreas .

Answer : D

Q27)The following buffer systems are found in the kidney EXCEPT :

A. Protein buffer system .

B. Ammonia buffer system .

C. Phosphate buffer system .

D. Bicarbonate buffer system.

Answer : A

Q28)Carnosine is a dipeptide of histidine and _____ :

A. β-Alanine

B. β-lysine

C. Tryptophan

D. α-lysine

E. α-alanine

Answer : A

Q29)Glycine and proline are the most abundant amino acids in the structure of:

A. Hemoglobin .

B. Myoglobin .

C. Insulin .

D. Collagen .

Answer : D

Q30)Which out of the following amino acids is a precursor for a mediator of allergies and inflammation :

A. Histidine .

B. Tyrosine.

C. Phenylalanine .

D. Tryptophan .

Answer : A

Q31) Which out of the following amino acid is a precursor of niacin (B3):

A. Tyrosine .

B. Threonine .

C. Tryptophan .

D. Phenylalanine .

E. Glycine .

Answer : A

Q32)Among these globular proteins , which one(s) has (have) 2 subunits:

A. Aldolase .
B. Alchhol dehydrogenase .
C.Triosephosphate isomerase .
D.Insulin .
E. B,C and D.

Answer : E

Q33)Which of the following is NOT correct about alpha helix :

A. R groups are involved in the H bonds .
B. All R groups point outward from helix .
C. The hydrogen bonds are parallel to helical axis.
D. Each peptide bond is trans and planar .
E. There are 3.6 amino acid per turn .

Answer : A

Q34)Which amino acid acts as precursor of dopamine :

A. Glycine .
B. Histidine.
C. Arginine .
D. Glutamic acid .
E. Tyrosine .

Answer :E

Q35)Which amino acid acts as a precursor for the biosynthesis of the neurotransmitter Serotonin :

A. Tryptophan .
B. Tyrosine .
C. Glycine .
D. Arginine .
E. Phenylalanine .

Answer :A

Q36)One of the following amino acids is involved in urea cycle :

A. Ornithine .
B. Citrulline .
C. Arginine .
D. Both a and b .
E. All of the above .

Answer : E

Q37)One of the following amino acids is considered to be a precursor of epinephrine synthesis :

A. Glycine .

B. Arginine .

C. Histidine .

D. Aspartic Acid .

E. Tyrosine .

Answer : E

Q38)One of the following amino acids is involved in the synthesis of Nitric Oxide(NO) in animals :

A. Arginine .

B. Phenylalanine .

C. Aspartate .

D. Ornithine .

E. Glycine .

Answer : A

Q39)An amino acid with a sulfhydryl(-SH) group in its side chain :

A. Methionine .

B. Cysteine .

C. Glycine .

D. Tyrosine .

E. Both A and B .

Answer : B

Q40)Among the following amino acids ; which one(s) is (are) sulfur -containing amino acid(s) :

A. Methionine .

B. Cysteine .

C. Glycine .

D. Tyrosine .

E. Both A and B.

Answer : E

Q41)The side chain of histidine contains :

A. Indole ring .

B. Phenol group .
C. Imidazole ring .
D. Guanidino ring .
E. Both A and C .

Answer : C

Q42)Which of the following amino acids is more likely to occupy the interior of a globular protein :

A. Methionine .
B. Aspartate .
C. Lysine .
D. Arginine .
E. All of the above .

Answer : A

Q43)Naturally occurring proteins are usually polymers of :

A. D- amino acids .
B. L- amino acids .
C. A mixture of D and L amino acids .
D. Either D amino acids or L- amino acids .

Answer : B

Q44) Which of the following amino acids has an imino group in its side chain :

A. Proline .
B. Asparagine .
C. Glutamate .
D. Histidine .

Answer : A

Q45)Isoelectric pH is designated as :

A. pKa .
B. pI .
C. Pi .
D. None of the above .

Answer :B

Q46)Blood clotting protein thrombin usually contains which of the following modified amino acids :

A. 4-Hydroxy proline .

B. 5-Hydroxy lysine .

C. 6-N-methyl lysine .

D. γ- Carboxy glutamate .

Answer : D

Q47)Which of the following statements about amino acids is correct?

A. Amino acids are classified according to the structures and properties of their side chains.

B. Amino acids are uncharged at neutral pH.

C. Amino acids in proteins are mainly in the D-configuration.

D. Twenty four amino acids are commonly used in protein synthesis.

Answer : A

Q48)Which type of bonding is responsible for the secondary structure of proteins:

A. Disulfide bridges between cysteine residues.

B. Hydrogen bonding between the C=O and N-H groups of peptide bonds.

C. Peptide bonds between amino acids.

D. Salt bridges between charged side chains of amino acids.

Answer : B

Q49)Which of the following statements about collagen is correct:

A. Collagen contains a high proportion of hydroxyproline residues.

B. Collagen is a globular, intracellular protein.

C. Collagen is of double helical structure .

D. Post-translational modification of collagen involves vitamin A.

E. Collagen contains only glycine and proline in its structure .

Answer : A

Q50)Which amino acid can form disulfide bonds?

A. Glycine.

B. Proline.

C. Glutamate.

D. Cysteine.

Answer : D

Q51)Number of chiral centers in isoleucine is:

A. 1.

B. 2.

C. 3.

D. 4.

E. None .

Answer : B

Q52)Which of the following information is responsible to specify the three-dimensional shape of a protein :

A. The protein's peptide bonds .

B. The protein's amino acid sequence .

C. The protein's interaction with other polypeptides .

D. Both B and C .

Answer : B

Q53)During the formation of the peptide bond which of the following takes place:

A. Hydroxyl group is lost from its carboxyl group of one amino acid and a hydrogen atom is lost from its amino group of another amino acid.

B. Hydrogen atom is lost from its carboxyl group of one amino acid and a hydroxyl group is lost from its amino group of another amino acid .

C. Hydroxyl group is lost from its carboxyl group of one amino acid and a hydroxyl group is lost from its amino group of another amino acid .

D. Hydrogen atom is lost from its carboxyl group of one amino acid and a hydrogen atom is lost from its amino group of another amino acid .

Answer : A

Q54)Which of the following statements is true about size-exclusion chromatography:

A. During the separation of a mixture of proteins, protein with smallest molecular weight is eluted first.

B. During the separation of a mixture of proteins, protein with largest molecular weight is eluted first .

C. During the separation of a mixture of proteins, protein with largest molecular weight is eluted last.

D. During the separation of a mixture of proteins, protein with largest molecular weight flow around the beads

Answer : B

Q55)Which of the following statements is true about affinity chromatography :

A. During the separation of a mixture of proteins, the protein which does not bind to ligand is eluted first.

B. During the separation of a mixture of proteins, the protein which does not bind to ligand is eluted last.

C. During the separation of a mixture of proteins, the protein which binds to ligand is eluted first.

D. Unwanted proteins are eluted by ligand solution.

Answer : A

Q56)Regarding ion-exchange chromatography ;which of the following statements is true :

A. This technique separates proteins mainly according to their molecular weight and charge .

B. The column matrix is a cationic exchanger when it is with bound anionic groups .

C. The column matrix is anionic exchanger when it is with bound anionic groups .

D. The column matrix is cationic exchanger when it is with bound cationic groups .

E. Both C and D .

Answer : B

Q57)One of the following provides a cation-exchange media :

A. Polystyrene resin (Dowex-50).

B. Polystyrene resin (Dowex-1).

C. DEAE .

D. Both A and B .

Answer : A

Q58)One of the following provides anion-exchange media :

A. DEAE .

B. Polystyrene resin (Dowex-1).

C. CM cellulose .

D. Both A and B .

Answer : D

Q59)Relating to affinity chromatography of Concanavalin A ; It specifically binds to :

A. Glucose .

B. Sucrose .

C. Maltose .

D. Galactose .

E. None of the above .

Answer : A

Q60)During electrophoresis ;adding SDS(Sodium Dodecyl Sulfate) allows us to :

A. Determine a protein's isoelectric point .

B. Determine an enzyme's specific activity .

C. Determine the amino acid composition of a protein .

D. Preserve a protein's native structure and biological activity .

E. Separate proteins exclusively on the basis of their molecular weights .

Answer : E

Q61)The term *specific activity* differs from the term *activity* in that specific activity :

A. Is measured only under optimal conditions .

B. Is the activity (enzyme units) in a milligram of protein .

C. Is the activity (enzyme units)of a specific protein .

D. Refers only to a purified protein .

E. Refers to proteins other than enzymes .

Answer : B

Q62)Protein purification aims mainly to obtain a sample of :

A. Lowest amount of protein and highest specific activity .

B. Highest amount of protein and highest specific activity .

C. Highest volume , least amount of protein and highest specific activity .

D. Highest percent recovery .

E. Both A and D.

Answer : A

Q63)Electrophoresis is a process of :

A. Separating proteins on the basis of their electric charge .

B. Separating proteins on the basis of their electric charge &size .

C. Separating proteins on the basis of their amino acid composition .

D. Separating proteins on the basis of their isoelectric point .

E. Both B and C

Answer : B

Q64)Relating to chemical cleavage of polypeptides ; Cyanogen bromide (BrCN) is used to :

A. Hydrolyze peptide bonds at the C-Terminus of methionine residues .

B. Hydrolyze peptide bonds at the N-Terminus of methionine residues .

C. Hydrolyze peptide bonds at the C-Terminus of lysine residues .

D. Hydrolyze peptide bonds at the C-Terminus of both methionine and lysine .

E. Hydrolyze peptide bonds at the N-Terminus of tryptophan residues .

Answer : A

Q65)Chymotrypsin is one of the enzymes used in enzymatic cleavage of polypeptides ;it cleaves the peptide bond at the C-Terminus of :

A. Tyrosine , Tryptophan and methionine .

B. Phenylalanine and leucine.

C. Methionine and tyrosine only .

D. Tyrosine , phenylalanine , and arginine .

E. Both A and B .

Answer :E

Q66) Which out of the followings is not a fibrous protein :

A. Carbonic anhydrase .

B. Collagen .

C. Fibrinogen .

D. Keratin .

Answer : A

Q67) In scurvy, which amino acid that is normally part of collagen is not synthesized :

A. Hydroxy Tryptophan .

B. Hydroxy Tyrosine .

C. Hydroxy Alanine .

D. Hydroxy Proline .

Answer : D

Q68) Which of the characteristics below apply to the amino acid Glycine :

A. Optically inactive .

B. Hydrophilic, basic and charged .

C. Hydrophobic .

D. Hydrophilic, acidic and charged .

Answer : A

Q69)Which of the following amino acids in myoglobin, a globular protein, is highly likely to be localized within the interior of the molecule :

A. Arginine .
B. Valine .
C. Aspartic acid .
D. Lysine .

Answer : B

Q70)Glycine and proline are the most abundant amino acids in the structure of :

A. Hemoglobin .
B. Myoglobin .
C. Insulin .
D. Collagen .

Answer : D

Q71)The two modified amino acids that are found in collagen are :

A. Glycine and proline .
B. Lysine and proline .
C. Hydroxylysine and hydroxyproline .
D. Hydroxyproline and hydroxyglycine.
E. Lysine and glycine.

Answer : B

Q72)Menkes' syndrome which is characterized by growth retardation and kinky hair;reflects a dietary deficiency of :

A. Copper .
B. Iron .
C. Calcium .
D. Iodine .
E. None of the above .

Answer :A

Q73)All of the amino acids that are found in proteins, except for proline, contain a(n) :

A. Amino group .
B. Thiol group .
C. Ester group .

D. Carboxyl group.

E. Carbonyl group .

Answer :A

Q74)Of the 20 standard amino acids, only _____ is not optically active. The reason is that its side chain _____.

A. Alanine ; is a simple methyl group .

B. Glycine ; is a hydrogen atom .

C. Glycine ; is unbranched .

D. Lysine ; contains only nitrogen .

E. Proline ; forms a covalent bond with the amino group .

Answer : B

Q75)Which of the following is correct concerning fetal hemoglobin?

A. Fetal hemoglobin is composed of two α and two γ subunits.

B. Fetal hemoglobin has a higher affinity for O2 than maternal HbA .

C. Fetal hemoglobin binds 2,3-BPG more tightly than normal adult hemoglobin.

D. Fetal hemoglobin binds oxygen less than HbA at all values of pO2.

E. Both A and B .

Answer :E

Q76)Which of the following statements describes *Bohr Effect* best :

A. Lowering the pH and increasing the partial pressure of CO2 results in the release of O2 from oxyhemoglobin.

B. Increasing the pressure of CO2 results in the release of O2 from oxyhemoglobin.

C. Increasing the pH and partial pressure of CO2 results in the release of O2 from deoxyhemoglobin .

D. None of the above .

Answer :A

Q77)Regarding to Sickle Cell Anemia ;Which of the following statements is correct :

A. It is caused by an impaired production of α -Chains of Hb.

B. It is caused by a substitution of Glu residue for a Phe residue at the β 6 position .

C. It is caused by because of oxidation of the proximal histidine and loss of heme group .

D. It is caused by a substitution of Val residue for a Glu residue at β 6 position .

E. It is caused by a substitution of Glu residue for His at the C-Terminus of the α -chain.

Answer : D

Q78)Binding of 2,3-bisphosphoglycerate (BPG) has the following effects on hemoglobin :

A. Promotes O2 dissociation from Hb.

B. Leads to a higher affinity to O2.

C. Causes a conformational changes in the Hb which in turn leads to closure of the cavity that BPG binds to .

D. Both A and C .

Answer : D

Q79)Majority of the monosaccharides found in the human body are of :

A. L-type .

B. D-type .

C. Mixture of D-type &L-type .

D. None of the above .

Answer : B

Q80)Sucrose is a disaccharide composed of :

A. 2 subunits of Glucose .

B. Glucose and Fructose .

C. Glucose and Galactose .

D. Fructose and Galactose .

Answer : B

Q81)The aldose sugar among the following is :

A. Arabinose .

B. Ribulose .

C. Fructose .

D. Ribose .

E. Both A and D .

Answer :E

Q82)" NOT readily available in our diets, beneficial for cartilage regeneration and joint inflammation "

The previous description applies best to which of the following sugars :

A. N-acetylglucoseamine .
B. N-acetylnuraminicacid .
C. Xyulose .
D. Glucose .
E. Fucose .

Answer : A

Q83)Breast milk contains all of the following sugars , EXCEPT :

A. Fructose .
B. Galactose .
C. Fucose .
D. N-acetylglucoseamine .
E. N-acetylnuraminicacid .:

Answer :A

Q84)Which of the following sequences correctly represents the sweetness of Glucose , Sucrose and Fructose :

A. Glucose <Sucrose <Fructose .
B. Sucrose <Glucose <Fructose .
C. Fructose >Sucrose > Glucose .
D. Fructose = Glucose = Sucrose

Answer: C

Q85)Which of the following sugars acts as a precursor for synthesis of Vitamin C in plants :

A. Fructose .
B. Ribose .
C. Glucose.
D. Ribulose .

Answer :C

Q86)Which pair of the following is an example of epimers :

A. Glucose & Galactose .
B. Glucose &Ribose .
C. Mannose& Glucose .
D. Ribose & Mannose .
E. None of the above .

Answer : A

Q87)When Sugars cyclize; the additional chiral carbon formed is called :

A. Penultimate Carbon .
B. Anomeric Carbon .
C. Gamma Carbon .
D. Alpha carbon .

Answer : B

Q88)Which of the following is NOT a reducing sugar :

A. Sucrose .
B. Maltose .
C. Lactose .
D. Fructose .
E. All of the above are reducing sugars .

Answer :A

Q89)One of the following is found in DNA :

A. Fucose .
B. Ribose.
C. Ribulose .
D. Deoxyribose .
E. Glucose .

Answer : D

Q90)Which of the following statements describes Amylose best :

A. Unbranched linear polymer with alpha 1-4 glycosidic linkages.
B. Unbranched linear polymer with beta 1-4 glycosidic linkages.
C. Highly branched, branched sites contain alpha 1-6 glycosidic linkages.
D. Highly branched, branched sites contain beta 1-6 glycosidic linkages.

Answer : A

Q91)Glycogen ,storage form of glucose in animals , is stored in :

A. Muscles &Liver .
B. Muscle &Brain .
C. Liver &Pancreas .
D. Muscles &Kidney .

Answer : A

Q92)One of the following sugars forms the exoskeleton of anthropods :

A. Agarose .

B. Cellulose .

C. Chitin .

D. Starch .

Answer : C

Q93)The most abundant carbohydrate found in nature is:

A. Starch .
B. Glycogen .
C. Cellulose .
D. Chitin .

Answer : C

Q94)) In Bacterial cell wall, the tetrapeptide that cross-links the polysaccharide contains mainly two amino acids which are:

A. D-Ala & D-Gln .

B. D-Ala & D-Asn .

C. L-Ala & D-Gln .

D. L-Gln & L-Ala .

Answer : A

Q95)In amylopectin the intervals of glucose units of each branch is:

A. 10-20.

B. 24-30.

C. 30-40.

D. 50-60.

Answer :B

Q96)Which of the following is used as Commercial sweetener in sugarless gum and candy :

A. Glucitol .
B. Xyulose .
C. Sorbose .
D. Sucrose .
E. Sucralose .

Answer : A

Q97)Glycogen, a polysaccharide, in your liver may be broken down to glucose by the process of :

A. Hydrolysis
B. Dehydration synthesis.
C. Condensation .
D. Isomerization.

Answer : A

Q98)Which of the following monosaccharides is a ketose :

A. Fructose .
B. Glucose .
C. Mannose .
D. Galactose

Answer :A

Q99)Which of the following statements about cellulose is true :

A. Humans can digest starch but not cellulose because they don't have the enzyme required for hydrolysis of β-Glycosidic linkages .
B. It is a storage polysaccharide for energy in plant cells.
C. It is a major structural component of plant cell walls.
D. It is a polymer composed of enantiomers of glucose.
E. Both A and C

Answer : E

Q100)The enzyme amylase can break glycosidic linkages between glucose monomers only if the monomers are the α form. Which of the following could amylase break down :

A. Chitin .
B. Cellulose .
C. Glycogen and chitin .
D. Glycogen .
E. None of the above .

Answer :D

اللهمَّ تقبل العَمل مع قلته ، والجُهد مع ضالّته والسَّعي مع شوائبه .

(وَآخِرُ دَعْوَاهُمْ أَنِ الْحَمْدُ للهِ رَبِّ الْعَالَمِينَ)