

NEET Important Questions with Solutions from Biomolecules

Q.1. Glucose is found to exist in two different crystalline forms α and β , called _____.

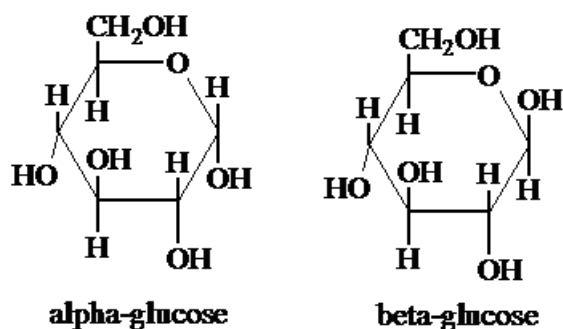
- A) anomers
- B) epimers
- C) enantiomers
- D) metamers

Answer: anomers

Solution: D-glucose can exist in two forms, i.e., α -D-glucose and β -D-glucose. They differ only in the direction that H and -OH groups point on the carbon 1 and are known as anomers.

When α -glucose molecules are joined, they form starch while β -glucose molecules are joined, they form polymer cellulose.

When a glucopyranose molecule is drawn in the Haworth projection, the designation ' α -' means that the hydroxyl group attached to C - 1 and the -CH₂OH group at C - 5 lies on opposite sides of the ring's plane (trans arrangement). The ' β -' means that they are on the same side of the plane (cis arrangement).



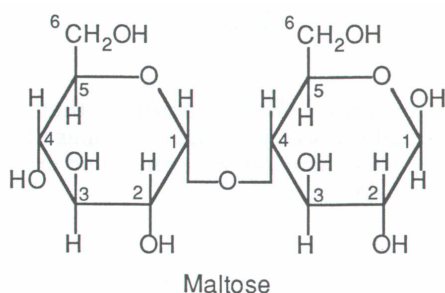
Q.2. Maltose is made up of _____.

- A) α - D-glucopyranose
- B) α and β - D-glucopyranose
- C) glucose and fructose
- D) fructose only

Answer: α - D-glucopyranose



Solution: Maltose, also known as maltobiose, is a disaccharide and formed by the condensation of two molecules of α – D–glucopyranose in which C1 of one glucose unit is connected to C4 of the other glucose unit.



Q.3. Deficiency of calcium causes _____

- A) rickets
- B) convulsion
- C) hypertension
- D) circulatory failure

Answer: rickets

Solution: Deficiency of calcium causes rickets. Rickets is the softening and weakening of bones in children, usually because of an extreme and prolonged vitamin D deficiency.

Q.4. Which one of the following gives positive Fehling's solution test?

- A) Sucrose
- B) Glucose
- C) Fats
- D) Protein

Answer: Glucose

Solution: Fehling's test is given by the compound which has an aldehyde functional group. As we know, glucose has a structure which contains an aldehyde $\text{CHO} - (\text{CHOH})_4 - \text{CH}_2\text{OH}$. So, it can give positive Fehling's solution test.

Glucose gives positive Fehling's solution test.

Q.5. Which of the following is correct about H-bonding in nucleotides?

- A) A – T, G – C
- B) A – G, T – C
- C) G – T, A – C
- D) A – A, T – T

Answer: A – T, G – C

Solution: It is by fact that pair of A – T, G – C has H-bonding in nucleotide.



- Q.6. Enzymes are made up of
- A) edible proteins
 - B) proteins with specific structure
 - C) nitrogen containing carbohydrates
 - D) carbohydrates

Answer: proteins with specific structure

Solution: Enzymes are made up of proteins with specific structure. Enzymes are also called biological catalysts. Since they are catalysts, they increase the rate of chemical reaction.

- Q.7. Which is not a true statement?
- A) α -carbon of most of α -amino acid is asymmetric
 - B) All natural amino acids are found in D-form
 - C) Human body can synthesize all proteins they need
 - D) At pI both amino and carboxylic groups exist in ionised form

Answer: All natural amino acids are found in D-form

Solution: All the statements are true except the statement that all proteins are found in D-form. Most of the proteins are found in L configuration.

- Q.8. Vitamin B₁₂ contains:
- A) Zn (II)
 - B) Ca (II)
 - C) Fe (II)
 - D) Co (II)

Answer: Co (II)

Solution: Vitamin B₁₂ contains Co (II). Cobalt is a transition element. Vitamin B₁₂ is found in fish, egg, meat etc., In the reduction of this vitamin, red blood cells are reduced in number.

- Q.9. Chargaffs rule states that in an organism _____.
- A) The amount of adenine (A) is equal to that of cytosine (C) and the amount of thymine (T) is equal to that of guanine (G).
 - B) The amount of all the bases is equal.
 - C) The amount of adenine (A) is equal to that of thymine (T) and the amount of guanine (G) is equal to that of cytosine (C).
 - D) The amount of adenine (A) is equal to that of guanine (G) and the amount of thymine (T) is equal to that of cytosine (C).

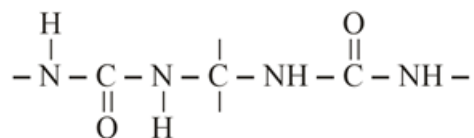
Answer: The amount of adenine (A) is equal to that of thymine (T) and the amount of guanine (G) is equal to that of cytosine (C).



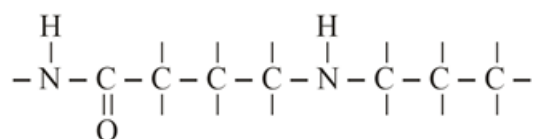
Solution: Chargaff's rule states that in an organism, the amount of adenine (A) is equal to that of thymine (T) and the amount of guanine (G) is equal to that of cytosine (C).

Q.10. Which one of the following structures represents the peptide chain?

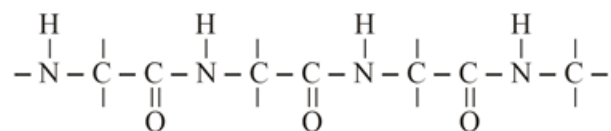
A)



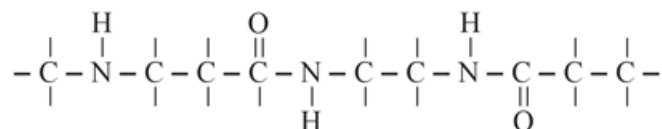
B)



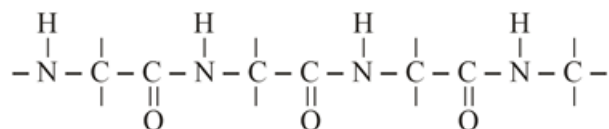
C)



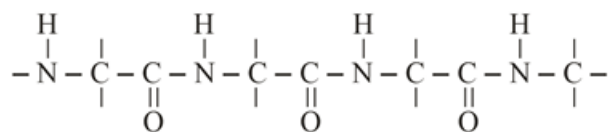
D)



Answer:



Solution: The peptide chain is a structure in which an amide bond is formed as shown below:



Q.11. In DNA, the complementary bases are

- A) adenine and guanine; thymine and cytosine.
- B) uracil and adenine; cytosine and guanine.
- C) adenine and thymine; guanine and cytosine.
- D) adenine and thymine; guanine and uracil.

Answer: adenine and thymine; guanine and cytosine.

Solution: DNA is a double stranded nucleotide having base, deoxyribose sugar and phosphate. Adenine and thymine; guanine and cytosine are complementary bases.

Q.12. The segment of DNA, which acts as the instrumental manual for the synthesis of the protein is:



- A) nucleotide
- B) ribose
- C) gene
- D) nucleoside

Answer: gene

Solution: Gene acts as the instrumental manual for the synthesis of the protein. A gene is the basic physical and functional unit of heredity. Genes are made up of DNA. Some genes act as instructions to make molecules called proteins.

Q.13. Which of the following hormones contains iodine?

- A) Insulin
- B) Testosterone
- C) Adrenaline
- D) Thyroxine

Answer: Thyroxine

Solution: Thyroxine contains iodine. Thyroxine is a hormone that the thyroid gland secretes into the bloodstream.

Once it enters the bloodstream, thyroxine travels to the organs, like the liver and kidneys, where it is converted to its active form of triiodothyronin.

Q.14. Which one of the following does not exhibit the phenomenon of mutarotation?

- A) (+) Sucrose
- B) (+) Lactose
- C) (+) Maltose
- D) (–) Fructose

Answer: (+) Sucrose

Solution: Reducing sugar that exists in hemiacetal and hemiketal forms, undergo mutarotation in aqueous solution.

Among the given carbohydrates, only sucrose is a non-reducing sugar as in it the hemiacetal and hemiketal groups of glucose and fructose are linked together through O–atom and thus, not free. Due to the absence of free hemiacetal or hemiketal group, sucrose does not exhibit mutarotation.

Q.15. Glycolysis is:

- A) Oxidation of glucose to pyruvate.
- B) Conversion of glucose to haem.
- C) Oxidation of glucose to glutamate.
- D) Conversion of pyruvate to citrate.

Answer: Conversion of pyruvate to citrate.



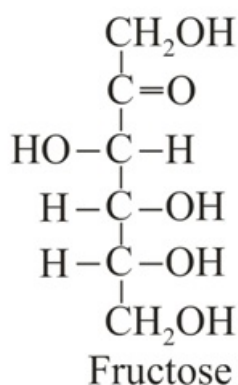
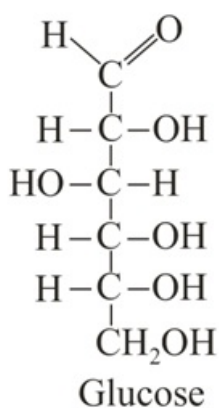
Solution: Glycolysis is the metabolic pathway that converts pyruvate to citrate. Glycolysis is the process in which one glucose molecule is broken down to form two molecules of pyruvic acid also known as pyruvate.

Q.16. Which of the following pairs give a positive Tollen's Test?

- A) Glucose, sucrose
- B) Glucose, fructose
- C) Hexanol, Acetophenone
- D) Fructose, sucrose

Answer: Glucose, fructose

Solution: Aldehyde and α -hydroxy ketones give a positive Tollen's test. As the glucose has an aldehyde and the fructose has an α -hydroxy ketone, so, these two can give a positive Tollen's test.



Q.17. The two forms of D-Glucopyranose obtained from the solution of D-Glucose are known as

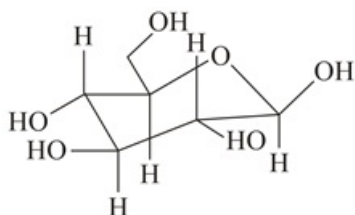
- A) Epimers
- B) Anomers
- C) Enantiomers
- D) Geometrical Isomers

Answer: Anomers

Solution: α -D-Glucopyranose and β -D-Glucopyranose are anomers as they are having the configuration change on the first carbon. Both the structures can show mutarotation.



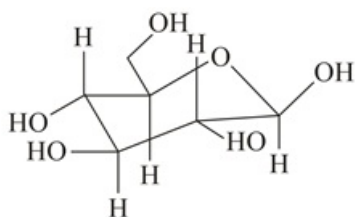
Q.18. The following carbohydrate is



- A) a ketohexose
- B) an aldohexose
- C) an α -furanose
- D) an β -pyranose

Answer: an β -pyranose

Solution:



It is a β -pyranose, as there is hydrogen bonding between the hydroxy hydrogen and the oxygen, which is embedded in the ring. Hence, it is an aldohexose.

Q.19. The incorrect statement among the following is:

- A) α -D-glucose and β -D-glucose are anomers.
- B) The penta acetate of glucose does not react with hydroxyl amine.
- C) Cellulose is a straight chain polysaccharide made up of only β -D-glucose units.
- D) α -D-glucose and β -D-glucose are enantiomers.

Answer: α -D-glucose and β -D-glucose are enantiomers.

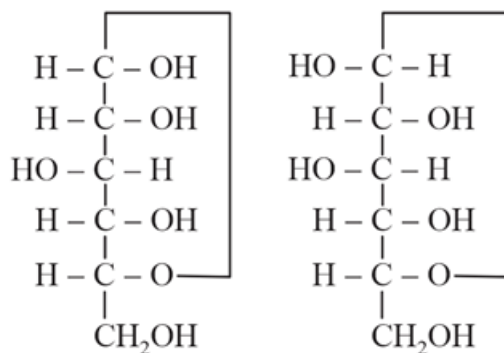


Solution:

α -D-glucose and β -D-glucose are anomers, which is a special type of epimer as the configuration at C-1 is different in both of them. The two structures are not mirror images of each other and are non-superimposable. Therefore, they are diastereomers.

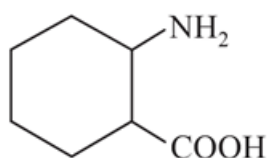
α -D-glucose:

β -D-glucose:

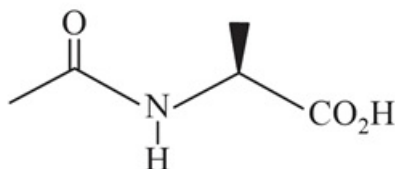


Q.20. Which of the following will not exist in zwitter ionic form at pH = 7?

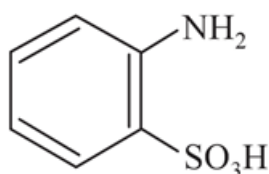
A)



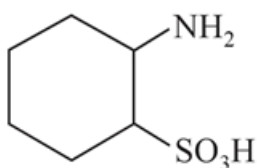
B)



C)

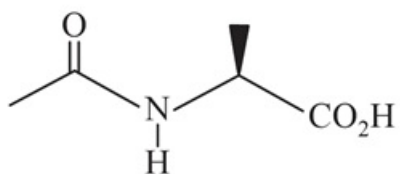


D)





Answer:

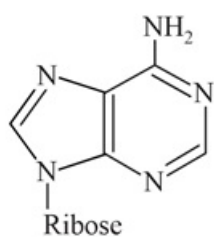


Solution:

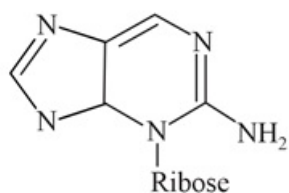
This compound can form a zwitter ion if the carboxylic acid group loses a proton to form COO^- group, and the N atom of amide accepts the proton to become NH_2^+ . But the N atom of amide is not basic, due to which this compound cannot exist in zwitter ionic form.

Q.21. Which of the following is the correct structure of Adenosine?

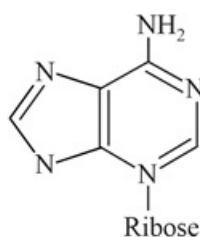
A)



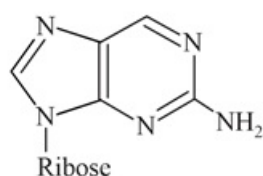
B)



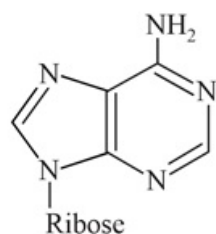
C)



D)



Answer:





Solution: Adenosine is a nucleoside formed by the binding of adenine base, which is a heterocyclic aromatic compound, consisting of two ring structures and a ribose sugar. The ribose sugar binds to nitrogen at position 9 by replacing the hydrogen atom and giving rise to adenosine.

Q.22. Among the following, the incorrect statement is:

- A) Cellulose and amylose has 1, 4 -glycosidic linkage.
- B) Lactose contains β -D-galactose and β -D-glucose.
- C) Maltose and lactose has 1, 4 -glycosidic linkage.
- D) Sucrose and amylose has 1, 2 -glycosidic linkage.

Answer: Sucrose and amylose has 1, 2 -glycosidic linkage.

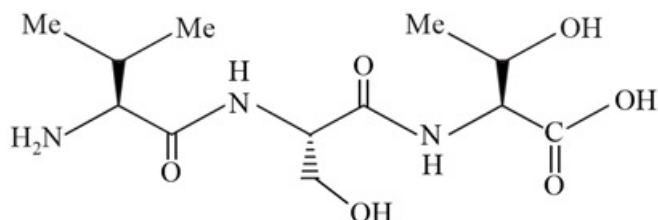
Solution: Amylose and cellulose are linear polysaccharides, composed entirely of glucose. However, in cellulose, the glucose residues occur in β - 1,4- linkage, and in amylose, it is α - 1,4 linkage.

Lactose is the disaccharide of milk. It consists of β - D-galactose joined to β - D-glucose by a β - 1,4-glycosidic linkage.

Maltose is composed of the two molecules of D-glucose by a α - 1,4-glycosidic linkage.

Sucrose is a common disaccharide, composed of the monosaccharides-glucose and fructose, which are linked together via 1.2-glycosidic linkage.

Q.23. The correct sequence of amino acids present in the tripeptide given below is:

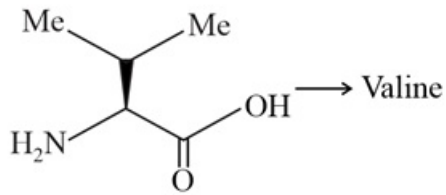


- A) Val - Ser - Thr
- B) Leu - Ser - Thr
- C) Thr - Ser - Leu
- D) Thr - Ser - Val

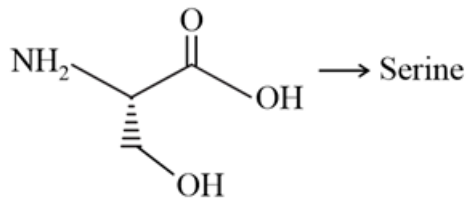
Answer: Val - Ser - Thr



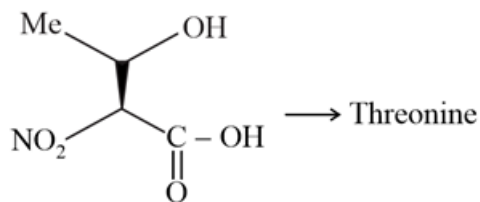
Solution:



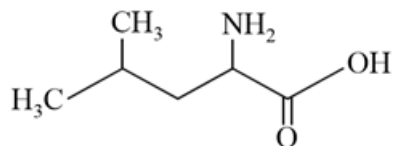
Valine possess isopropyl group.



Serine have $-\text{CH}_2\text{OH}$ group.



Threonine have $-\overset{\text{CH}}{\underset{\text{CH}_3}{|}}-\text{OH}$ group.



Leucine have $-\text{CH}_2-\overset{\text{CH}}{\underset{\text{CH}_3}{|}}-\text{CH}_3$ group.

Hence, from the given structure, we can identify the correct sequence.

Val – Ser – Thr.

Q.24. Thymine is:

- A) 5-methyluracil
- B) 4-methyluracil
- C) 3-methyluracil
- D) 1-methyluracil

Answer: 5-methyluracil

Solution: Thymine is an amino acid. It is formed when the 5 carbon position of uracil is substituted by the methyl group. So, it is a 5-methyl uracil.

Q.25. Methyl- α -D-glucoside and methyl- β -D-glucoside are:

- A) epimers



- B) anomers
- C) enantiomers
- D) conformational diastereomers

Answer: anomers

Solution: Methyl glucosides are obtained when one molecule of the methyl alcohol combined with glucose. The resultant cyclic structure will convert the aldehydic carbon asymmetric, and hence, two methyl glucosides could exist. These isomers are differing in configuration at the asymmetric carbon produced due to the ring formations are known as anomers.

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