1. Protein on reaction with which yields Ruhemann's purple? ***AIIMS 2019***
(a) Ninhydrin (b) Cu^{2+}
(c) H_2O_2 (d) Benedict's solution

2. Name the most abundant protein in animal world.
(a) RuBisCO (b) Carboxylase-oxygenase
(c) Collagen (d) Cellulose

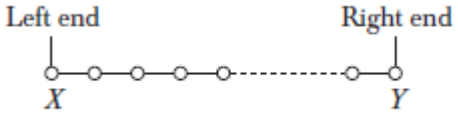
3. Which is the most abundant protein in whole of the biosphere?
(a) Collagen (b) Trypsin
(c) Insulin (d) RuBisCO

4. Identify the correct pair.

Proteins	**Functions**
(a) Collagen	Hormone
(b) Antibody	Fights infectious agents
(c) Insulin	Intercellular ground substance
(d) Trypsin	Enables glucose transport in cell

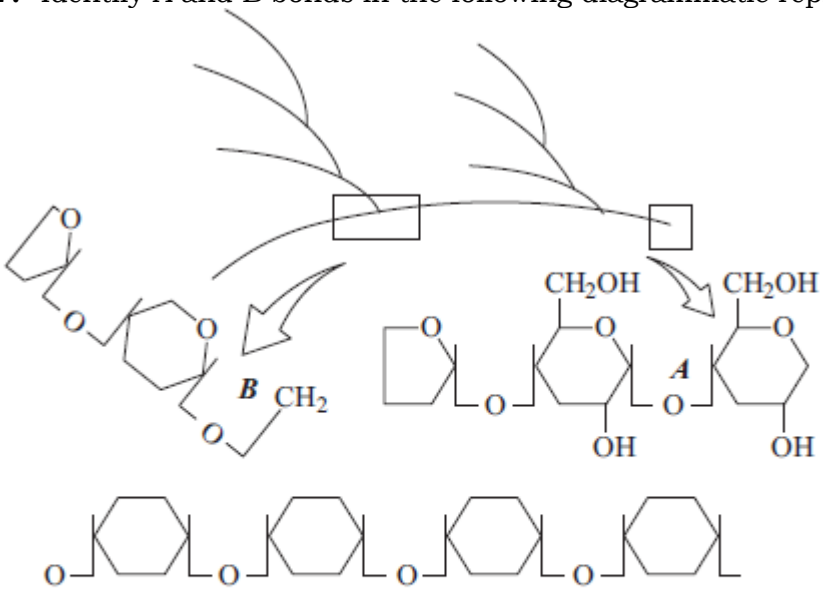
5. Which two functional groups are characteristic of sugars? ***NEET 2018***
(a) Carbonyl and phosphate (b) Carbonyl and methyl
(c) Hydroxyl and methyl (d) Carbonyl and hydroxyl

6. Name the term given to the left and right ends of a polysaccharide.



(a) Left end–N-terminal end, Right end–C-terminal end
(b) Left end–Reducing end, Right end–Non-reducing end
(c) Left end–Non-reducing end, Right end–Reducing end
(d) Left end–C-terminal end, Right end–N-terminal end

7. Identify *A* and *B* bonds in the following diagrammatic representation of a portion of glycogen.



Choose the correct option.
(a) A = 1, 6 α-glycosidic bonds, B = 1, 4 α-glycosidic bonds
(b) A = 1, 1 α-glycosidic bonds, B = 1, 1 α-glycosidic bonds
(c) A = 1, 4 α-glycosidic bonds, B = 1, 4 α-glycosidic bonds
(d) A = 1, 4 α-glycosidic bonds, B = 1, 6 α-glycosidic bonds

8. Select the correct option, which represents the homopolysaccharides made up of glucose monomers.
(a) Sucrose, lactose, maltose
(b) Chitin, glycogen, starch
(c) Starch, inulin, peptidoglycan
(d) Starch, glycogen, cellulose

9. For nucleic acids, the building block is a
(a) nucleotide (b) nucleoside
(c) polynucleotide (d) sugar

10. Name the heterocyclic compounds, which are known as nitrogenous bases. Choose the most appropriate option.
(a) Adenine, guanine, uracil, cytosine and thymine
(b) Adenine, guanine, uracil and thymine
(c) Adenine, guanine, cytosine, uracil
(d) None of the above

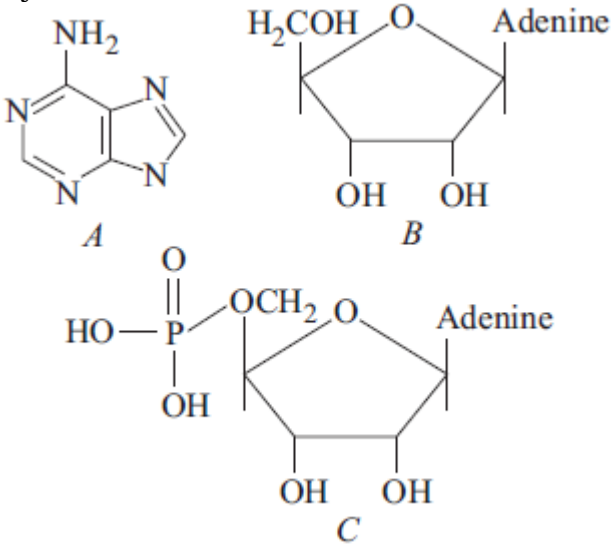
11. Select the correct pair of substituted purines.
(a) Cytosine and thymine (b) Adenine and guanine
(c) Uracil and cytosine (d) Guanine and uracil

12. A nucleotide has three chemically distinct compounds, namely, *A*, *B* and *C*. Choose the correct option for *A*, *B* and *C*.
(a) A–Sugar, B–Carbonates, C–Chlorides
(b) A–DNA, B–Cellulose, C–Chitin
(c) A–Heterocyclic compound, B–Monosaccharide, C–Phosphate
(d) A–Phosphoric acid, B–Proteins, C–Acids

13. The sugars found in polynucleotides are

A	B
(a) ribose	sucrose
(b) 2¢ deoxyribose	ribose
(c) ribose	dextrose
(d) deoxyribose	ribulose

14. Identify the structural formulae and select the correct option.



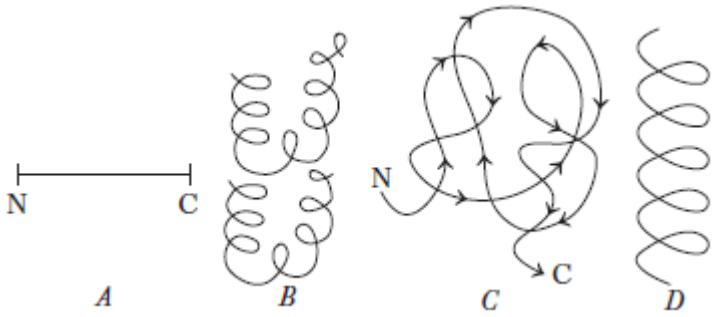
(a) A–Adenine, B–Adenosine, C–Adenylic acid
(b) A–Guanine, B–Adenosine, C–Adenylic acid
(c) A–Adenosine, B–Adenylic acid, C–Adenine
(d) A–Uracil, B–Adenosine, C–Adenylic acid

15. Which of the following is incorrect?
(a) DNA and RNA consist of nucleotides only
(b) Adenylic acid is a nucleoside
(c) Uridine is a nucleoside
(d) N-bases (A, G, C, T, U) have heterocyclic rings

16. Primary structure of proteins is due to the presence of
(a) peptide bond (b) covalent bond
(c) disulphide bond (d) ionic bonds

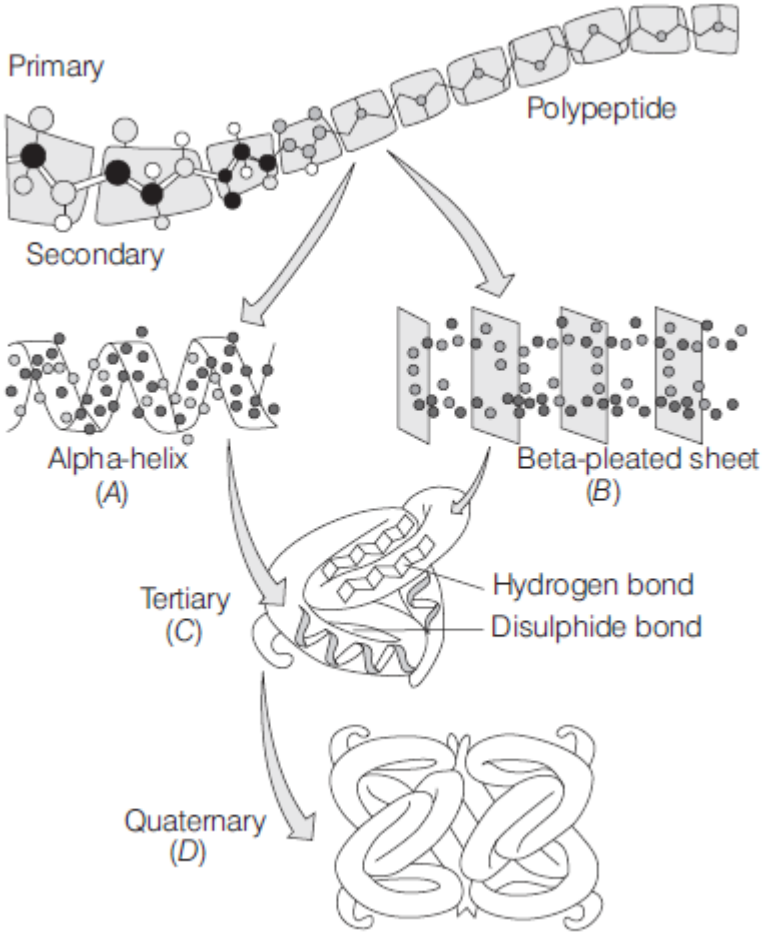
17. In a protein structure, the first amino acid and the last amino acid are respectively called as
(a) N-terminal amino acid, C-terminal amino acid
(b) C-terminal amino acid, N-terminal amino acid
(c) a-amino acid, b-amino acid
(d) b-amino acid, a-amino acid

18. Give the names of the structures of proteins as shown in the figures given below



(a) A = 1° structure, B = 2° structure, C = 3° structure, D = 4° structure
(b) A = 4° structure, B = 2° structure, C = 3° structure, D = 1° structure
(c) A = 1° structure, B = 4° structure, C = 3° structure, D = 2° structure
(d) A = 4° structure, B = 3° structure, C = 2° structure, D = 1° structure

19. Refer to the given figure of various levels of protein structure



Formation of structures *A*, *B*, *C* and *D* is through

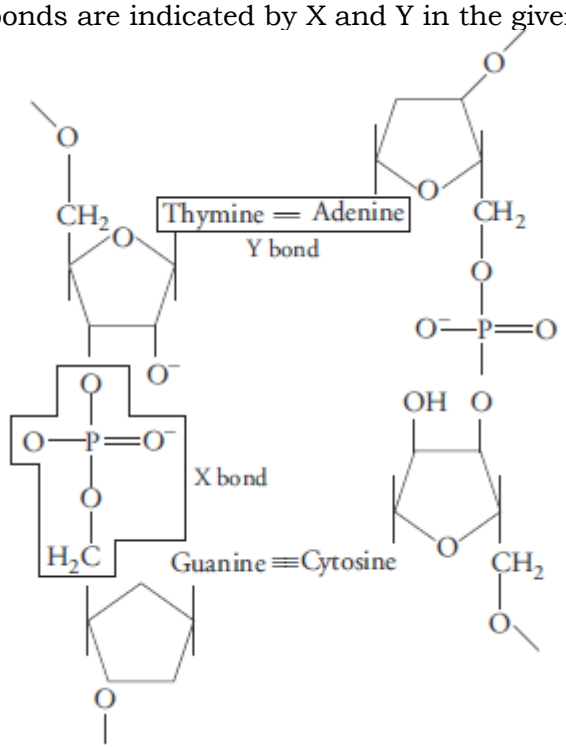
	A	B	C	D
(a)	H-bonding in single amino acid chain only	H-bonding in between two or more polypeptide chains	Further coiling in α-helix only	Both α-helix and β- sheet joined and coiled together
(b)	H-bonding in between two or more polypeptide chains	H-bonding in single amino acid chain only	Further coiling in α-helix only	Both α-helix and β- sheet joined and coiled together
(c)	H-bonding in between two or more polypeptide chains	H-bonding in single amino acid chain only	Both α-helix and β-sheet joined and coiled together	Further coiling in α-helix only
(d)	H-bonding in single amino acid chain only	H-bonding in between two or more polypeptide chains	Further folding of two or more secondary structures	Further folding of a number of tertiary structures

20. Adult human haemoglobin consists of
(a) 2 subunits (b) 2 subunits (b, b)
(c) 4 subunits (2a, 2b) (d) 3 subunits (2a, b)

21. Acidic amino acids carry two ¾COOHand one ¾NH_2 groups per molecule. Keeping this in mind, select the correct pair of acidic amino acid.
(a) Lysine and arginine
(b) Aspartic acid and glutamic acid
(c) Glycine and alanine
(d) Both (a) and (b)

22. In a polysaccharide, the individual monosaccharides are linked by a
(a) glycosidic bond (b) peptide bond
(c) ester bond (d) phosphodiester bond

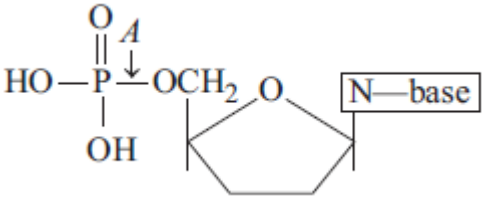
23. Which bonds are indicated by X and Y in the given diagram.



(a) X–Glycosidic bond, Y–Hydrogen bond
(b) X–Phosphodiester bond, Y–Hydrogen bond

(c) X–Glycosidic bond, Y–Phosphodiester bond
(d) X–Phosphodiester bond, Y–Glycosidic bond

24. In the given structure '*A*' represents



(a) ester bond (b) ionic bond
(c) phosphate bond (d) glycosidic bond

25. The elimination of water moiety during the formation of peptide bond is
(a) peptide hydration (b) dehydration
(c) hydration (d) reduction

26. Which of the following is the least likely to be involved in stabilising the three-dimensional (3D) folding of most proteins? ***NEET 2016***
(a) Hydrogen bonds (b) Electrostatic interaction
(c) Hydrophobic interaction (d) Ester bonds

27. In a DNA strand, nitrogenous bases pair with each other with the help of
(a) hydrogen bond
(b) van der Waals' interaction
(c) covalent bond
(d) ionic bond

28. According to Watson and Crick model of DNA
(a) DNA exists as a double helix
(b) The two strands of polynucleotide are antiparallel to each other
(c) The backbone is formed by sugar and nucleic base
(d) Both (a) and (b)

29. The form of DNA with 34Å pitch with a rise per base pair of 3.4Å is called
(a) A-DNA (b) B-DNA
(c) Z-DNA (d) C-DNA

30. The pyrimidine base, which confers additional stability to DNA over RNA is
(a) adenine (b) guanine
(c) cytosine (d) thymine

1. (a)
2. (c)
3. (d)
4. (*b*) Option (b) contains the correct match. Rest of the matches are incorrect and can be corrected as **Proteins Functions** Collagen Intercellular ground substance Trypsin Enzyme Insulin Hormone

5. (*d*) Sugars characteristically possess two functional groups, i.e. carbonyl and hydroxyl. Sugars are chemically carbohydrates. They are polyhydroxy aldoses, ketoses and their condensation roducts. Aldoses bear a terminal aldehyde or —CHO group while ketoses have an internal ketone or —CO group.

6. (c)
7. (*d*) A represents 1, 4a-glycosidic bonds as the glucose residues in glycogen are linked by this bond. B represents 1, 6a-glycosidic bonds as this bond creates branches in glycogen.

8. (*d*) Homopolysaccharides are composed of monosaccharide molecules of a single type. They include three biologically important substances glycogen, starch and cellulose.

9. (*a*) For nucleic acids, the building block is a nucleotide. A nucleotide has three chemically distinct components, i.e. one is a heterocyclic nitrogenous base compound, second is a pentose monosaccharide and the third is a phosphoric acid or a phosphate group.
10. (a)
11. (*b*) Adenine and guanine are substituted purines, while the rest, i.e. uracil, cytosine and thymine, are substituted pyrimidines.

12. (c)
13. (b)
14. (*a*) Structure ‘A’ represents adenine, which is a substituted purine. Structure ‘B’ represents adenosine, which is a nucleoside. Structure ‘C’ represents adenylic acid, which is a nucleotide.

15. (b)
16. (a)
17. (*a*) In proteins, the left end represented by the first amino acid is termed as the N-terminal amino acid due to the presence of a free amino group. The right end represented by the last amino acid is termed as the C-terminal amino acid due to the presence of a free carboxyl group.

18. (*c*) A represents the primary structure of proteins. B represents the quarternary structure of proteins. C represents the tertiary structure of proteins. D represents the secondary structure of proteins.

19. (*d*) Option (d) is correct. l Alpha helix (A) is formed by the formation of H-bond between the NH group of one amino acid and the CO group of another amino acid located three or four residues earlier along the protein sequence. l b-pleated sheet (B) is formed by the formation of at least two to three hydrogen bonds between two or more protein strands laterally. l Tertiary protein structure (C) is formed by the bending nd folding of two or more protein secondary structures. l Quarternary protein structure (D) consists of an assembly of two or more polypeptides or subunits. It is formed by further folding in two or more tertiary protein structures.

20. (c)
21. (b)
22. (a)
23. (*b*) Given figure represents a part of DNA molecule in which bond X represents the phosphodiester bond and Y represents the hydrogen bond.

24. (*a*) In the given structure, a represents the ester bond formed by condensation reactions, involving elimination f water.

25. (b)

26. (*d*) Ester bond is formed between sugar and phosphate in a nucleotide and is not involved in stabilising the three dimensional (3D) folding of most proteins. The tertiary protein structure is the 3D structure of protein. It is stabilised by the use of hydrogen bond, ionic bond, van der Waals' interactions, covalent bond and hydrophobic bond.

27. (*a*) In a DNA strand, nitrogenous bases pair with each other with the help of hydrogen bonds. There are two hydrogen bonds between A and T and three hydrogen bonds between G and C.

28. (*d*) Both options (a) and (b) are correct with respect to the structure of DNA elucidated by Watson and Crick. Option (c) is incorrect and can be corrected as The backbone of DNA is formed by the sugar phosphate sugar chain.

29. (*b*) In one form of DNA, each DNA strand appears like a helical staircase and each step of ascent is represented by a pair of bases. At each ascent step, the pitch would be 34 Å and the rise per base pair would be 3.4 Å. This form of DNA is called the B-DNA.

30. (*d*) In DNA, thymine (5-methyl uracil) is present, which provides extra stability to DNA as it does not contain 2¢—OH group like uracil, which is present in RNA in place of thymine.