

# **CHEMISTRY**

**(Q&A Bank for CEE & JEE Mains)**



**Assam Electronics Development Corporation Limited  
(AMTRON)**

(A Government of Assam Undertaking)

Name of the textbook

*Chemistry*  
*(Class XII)*

Name of the Chapter

*Polymers*  
*(Unit 15)*

**LEVEL 1**

1. Polymer formation from monomers starts by  
 (a) condensation reaction between monomers  
 (b) coordinate reaction between monomers  
 (c) conversion of monomer to monomer ions by protons  
 (d) hydrolysis of monomers.

2. Nylon threads are made of

- (a) polyvinyl polymer
- (b) polyester polymer
- (c) polyamide polymer
- (d) polyethylene polymer.

3. Which of the following is a polyamide?

- (a) Teflon
- (b) Nylon66
- (c) Terylene
- (d) Bakelite

4. Which of the following is fully fluorinated polymer?

- (a) Neoprene
- (b) Teflon
- (c) Thiokol
- (d) PVC

5. Bakelite is obtained from phenol by reaction with

- (a) HCHO
- (b)  $(\text{CH}_2\text{OH})_2$
- (c)  $\text{CH}_3\text{CHO}$
- (d)  $\text{CH}_3\text{COCH}_3$

6. RNA is different from DNA because RNA contains

- (a) ribose sugar and thymine
- (b) ribose sugar and uracil
- (c) deoxyribose sugar and thymine
- (d) deoxyribose sugar and uracil.

7. The functional group, which is found in amino acid is

- (a)  $-\text{COOH}$  group
- (b)  $-\text{NH}_2$  group
- (c)  $-\text{CH}_3$  group
- (d) both (a) and (b).

8. Complete hydrolysis of cellulose gives

- (a) D-fructose
- (b) D-ribose
- (c) D-glucose
- (d) L-glucose.

**LEVEL 2**

9. The reason for double helical structure of DNA is

- operation of
- (a) van der Waal's forces
  - (b) dipole-dipole interaction
  - (c) hydrogen bonding
  - (d) electrostatic attractions.

10. Identify the correct statement regarding enzymes.

- (a) Enzymes are specific biological catalysts that can normally function at very high temperatures ( $T \sim 1000 \text{ K}$ ).
- (b) Enzymes are normally heterogeneous catalysts that are very specific in action.
- (c) Enzymes are specific biological catalysts that cannot be poisoned.
- (d) Enzymes are specific biological catalysts that possess well-defined active sites.

11. Which base is present in RNA but not in DNA?

- (a) Uracil
- (b) Cytosine
- (c) Guanine
- (d) Thymine.

12. Insulin production and its action in human body are responsible for the level of diabetes.

This compound belongs to which of the following categories?

- (a) A coenzyme
- (b) A hormone
- (c) An enzyme
- (d) An antibiotic.

13. In both DNA and RNA, heterocyclic base and phosphate ester linkages are at

- (a) C5' and C2' respectively of the sugar molecule
- (b) C2' and C5' respectively of the sugar molecule
- (c) C1' and C5' respectively of the sugar molecule
- (d) C5' and C1' respectively of the sugar molecule

**14.** The term anomers of glucose refers to

- (a) isomers of glucose that differ in configurations at carbons one and four (C-1 and C-4)
- (b) a mixture of (D)glucose and (L)glucose
- (c) enantiomers of glucose
- (d) isomers of glucose that differ in configuration at carbon one (C-1).

**15.** The pyrimidine bases present in DNA are

- (a) cytosine and adenine
- (b) cytosine and guanine
- (c) cytosine and thymine
- (d) cytosine and uracil.

**16.** The secondary structure of a protein refers to

- (a) fixed configuration of the polypeptide backbone
- (b) a helical backbone
- (c) hydrophobic interactions
- (d) sequence of  $\alpha$ -amino acids.

**17.**  $\alpha$ -D-(+)glucose and  $\beta$ -D-(+)glucose are

- (a) enantiomers
- (b) conformers
- (c) epimers
- (d) anomers

## SOLUTIONS

**1. (a) :** Polymerisation takes place either by condensation or addition reactions.

**2. (c) :** Nylon threads are polyamides. They are the condensation polymers of diamines and dibasic acids.

**3. (b)**

**4. (b)**

**5. (a) :** Bakelite is a thermosetting polymer which is made by reaction between phenol and HCHO.

**6. (b) :** DNA      RNA

(a) Pyrimidine Cytosine Cytosine derivatives      Thymine      Uracil

(b) Purine      Adenine Adenine derivatives      Guanine Guanine

(c) Sugar      Deoxyribose Ribose

**7. (d) :** An amino acid is a bi-functional organic molecule that contains both a carboxyl group,  $-\text{COOH}$ , as well as an amino group,  $-\text{NH}_2$ .

**8. (c) :**  $(\text{C}_6\text{H}_{10}\text{O}_5)_n + n\text{H}_2\text{O} \rightarrow n\text{C}_6\text{H}_{12}\text{O}_6 + \text{H}^+$

Cellulose is a straight chain polysaccharide composed of D-glucose units which are joined by  $\beta$ -glycosidic linkages. Hence cellulose on hydrolysis produces only D-glucose units.

**9. (c) :** The two polynucleotide chains or strands of DNA are linked up by hydrogen bonding between the nitrogenous base molecules of their nucleotide monomers.

Adenine = Thymine

*two hydrogen bonds*

Cytosine = Guanine

*three hydrogen bonds*

**10. (d) :** Enzymes are shape selective specific biological catalysts which normally functions effectively at body temperature.

**11. (a) :** RNA contains cytosine and uracil as pyrimidine bases while DNA has cytosine and thymine. Both have the same purine bases i.e. guanine and adenine.

**12. (b) :** Insulin is a proteinaceous hormone secreted by  $\beta$  cells by islet of Langerhans of pancreas in our body.

**13. (c)**

**14. (d) :** Due to cyclic hemiacetal or cyclic hemiketal structures, all the pentoses and hexoses exist in two stereoisomeric forms i.e.  $\alpha$  form in which the OH at  $\text{C}_1$  in aldoses and  $\text{C}_2$  in ketoses lies towards the right and  $\beta$  form in which it lies towards left. Thus glucose, fructose, ribose, etc., all exist in  $\alpha$  and  $\beta$  form. Glucose exists in two forms  $\alpha$ -D-glucose and  $\beta$ -D-glucose.

**15. (c) :** DNA contains cytosine and thymine as pyrimidine bases and guanine and adenine as purine bases.

**16. (b) :** Secondary structure of proteins is mainly of two types.

(i)  $\alpha$ -helix : This structure is formed when the chain of  $\alpha$ -amino acid coils as a right handed screw (called  $\alpha$ -helix) because of the formation of hydrogen bonds between amide groups of the same peptide chain.

(ii)  $\beta$ -plated sheet : In this structure the chains are held together by a very large number of hydrogen bonds between  $\text{C}=\text{O}$  and  $\text{NH}$  of different chains.

**17. (d)**