

MSc BIOTECHNOLOGY
I YEAR
SEMESTER – I
PAPER – BIOCHEMISTRY

QUESTION BANK

1. Which of the following is a ketose sugar?

- A) Glucose
- B) Galactose
- C) Fructose
- D) Mannose

Answer: C) Fructose

2. Which disaccharide is known as table sugar?

- A) Maltose
- B) Lactose
- C) Sucrose
- D) Trehalose

Answer: C) Sucrose

3. Which polysaccharide is the main storage form of glucose in plants?

- A) Glycogen
- B) Cellulose
- C) Starch
- D) Inulin

Answer: C) Starch

4. Which amino acid is NOT essential for humans?

- A) Leucine
- B) Valine
- C) Alanine
- D) Lysine

Answer: C) Alanine

5. The Ramachandran Plot is used to analyze:

- A) Protein primary structure
- B) Protein secondary structure
- C) Protein tertiary structure
- D) Protein conformational angles

Answer: D) Protein conformational angles

6. Which lipid is a major component of biological membranes?

- A) Triacylglycerols
- B) Glycerophospholipids
- C) Waxes
- D) Sterols

Answer: B) Glycerophospholipids

7. Which of the following is an essential fatty acid?

- A) Palmitic acid
- B) Stearic acid

- C) Linoleic acid
- D) Oleic acid

Answer: C) Linoleic acid

8. Chargaff's rule states that in DNA:

- A) A = T and G = C
- B) A = C and G = T
- C) A = G and C = T
- D) A + T = G + C

Answer: A) A = T and G = C

9. Which nitrogen base is found only in RNA?

- A) Adenine
- B) Thymine
- C) Uracil
- D) Cytosine

Answer: C) Uracil

10. The sugar present in RNA is:

- A) Deoxyribose
- B) Ribose
- C) Glucose
- D) Fructose

Answer: B) Ribose

11. Which of the following is a heteropolysaccharide?

- A) Cellulose
- B) Glycogen
- C) Hyaluronic acid
- D) Chitin

Answer: C) Hyaluronic acid

12. Keratan sulfate is found in:

- A) Bacterial cell walls
- B) Cartilage and cornea
- C) Plant cell walls
- D) Insect exoskeleton

Answer: B) Cartilage and cornea

13. Which protein structure level involves the sequence of amino acids?

- A) Primary
- B) Secondary
- C) Tertiary
- D) Quaternary

Answer: A) Primary

14. Sphingolipids are derived from:

- A) Glycerol
- B) Sphingosine
- C) Cholesterol

D) Fatty acids only

Answer: B) Sphingosine

15. The B-form of DNA is:

A) Left-handed

B) Right-handed and helical

C) Single-stranded

D) Linear without supercoiling

Answer: B) Right-handed and helical

16. Topoisomerases are enzymes that:

A) Synthesize DNA

B) Degrade DNA

C) Change DNA supercoiling

D) Repair RNA

Answer: C) Change DNA supercoiling

17. Which RNA carries amino acids during protein synthesis?

A) mRNA

B) tRNA

C) rRNA

D) snRNA

Answer: B) tRNA

18. Mannose is a/an:

A) Aldohexose

B) Ketopentose

C) Deoxy sugar

D) Sugar alcohol

Answer: A) Aldohexose

19. Which of these is a storage lipid?

A) Phosphatidylcholine

B) Triacylglycerol

C) Cholesterol

D) Sphingomyelin

Answer: B) Triacylglycerol

20. Heparin acts as:

A) An energy source

B) A structural polysaccharide

C) An anticoagulant

D) A membrane lipid

Answer: C) An anticoagulant

Fill in the Blanks (20 Questions)

1. Glucose and fructose are examples of _____.
Answer: monosaccharides
2. In Haworth projection, the cyclic form of glucose is represented as a _____ ring.
Answer: pyranose
3. Maltose is composed of two molecules of _____.
Answer: glucose
4. Cellulose is a homopolysaccharide made of _____ units.
Answer: β -D-glucose
5. The amino acid having a sulfur atom in its side chain is _____.
Answer: cysteine / methionine (either accepted)
6. The peptide bond is formed between _____ and _____ groups of amino acids.
Answer: amino, carboxyl
7. The _____ structure of protein refers to the 3D folding of a polypeptide chain.
Answer: tertiary
8. Lipids are classified into simple, complex, and _____ lipids.
Answer: derived
9. Fatty acids with no double bonds are called _____.
✓ Answer: saturated
10. Linolenic acid is an example of an _____ fatty acid.
Answer: essential / polyunsaturated
11. Cholesterol is a type of _____.
Answer: sterol
12. Chargaff's rule helped in determining the _____ structure of DNA.
Answer: double helical
13. A nucleoside consists of a sugar and a _____.
Answer: nitrogenous base
14. The A-form of DNA is _____-handed and more compact than B-DNA.
Answer: right
15. _____ are enzymes that relieve supercoiling in DNA.
Answer: Topoisomerases
16. mRNA carries the genetic code from DNA to the _____.
Answer: ribosome

17. Inulin is a homopolysaccharide of _____.

Answer: fructose

18. Keratan sulphate and chondroitin sulphate are examples of _____.

Answer: glycosaminoglycans / heteropolysaccharides

19. The bond between glycerol and fatty acids in triacylglycerols is an _____ bond.

Answer: ester

20. tRNA has a _____ secondary structure.

Answer: cloverleaf

DESCRIPTIVE QUESTIONS

1. WRITE ABOUT MONOSACHARIDES AND ITS PROPERTIES
2. DISCUSS ABOUT POLY SACHARIDES
3. WRITE CLASSIFICATION OF AMINOACIDS
4. WRITE INDETAIL ABOUT STRUCTURE OF PROTIENS
5. DISCUSS ABOUT DISACHARIDES