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CUET · CHEMISTRY · CLASS XII · CODE 306

Biomolecules

CUET unit: Biomolecules

By **UniDrill** · NCERT-grounded study material

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📌 Snapshot

- Defines four major biomolecule families — carbohydrates, proteins, nucleic acids and vitamins — and the role of hormones as intercellular messengers.
- Builds carbohydrate chemistry from classification (mono/oligo/polysaccharide, reducing/non-reducing, aldose/ketose) up to glucose structure, mutarotation, sucrose/maltose/lactose, and starch/cellulose/glycogen.
- Develops protein chemistry from α-amino acids, zwitterions and peptide bond formation to the four levels of structure (primary, secondary α-helix/β-pleated sheet, tertiary, quaternary) and denaturation.
- Covers enzymes as globular-protein biocatalysts (lowering activation energy), classifies vitamins as fat-soluble (A, D, E, K) and water-soluble (B-complex, C) with deficiency diseases, and contrasts DNA vs RNA on sugar, bases, structure and function.
- CUET regularly draws direct factual MCQs from the disaccharide table, vitamin–deficiency table, DNA/RNA differences, and amino-acid trivia (essential vs non-essential, zwitterion).

📖 Detailed Notes

2.1 Core concepts

- Carbohydrates are optically active polyhydroxy aldehydes/ketones or compounds that produce such units on hydrolysis; they are also called saccharides (Greek sakcharon = sugar); empirical formula often $C_x(H_2O)_y$, leading to the older name "hydrates of carbon" (NCERT §10.1, p. 281-282).
- Classification on hydrolysis behaviour gives three groups: monosaccharides (cannot be hydrolysed further, ~20 known in nature, e.g. glucose, fructose, ribose, galactose), oligosaccharides (yield 2–10 monosaccharide units, e.g. disaccharides sucrose/maltose/lactose), and polysaccharides (yield many units, e.g. starch, cellulose, glycogen, gums) (NCERT §10.1.1, p. 282).
- Reducing sugars reduce Fehling's solution ($Cu^{2+} \rightarrow Cu_2O$, red-brown) and Tollens' reagent ($Ag^+ \rightarrow$ Ag mirror); all monosaccharides (aldose or ketose, because of tautomerism via the Lobry de Bruyn-van Ekenstein rearrangement) are reducing; sucrose is non-reducing while maltose and lactose are reducing (NCERT §10.1.1 & §10.1.3, p. 282, 287).

- Monosaccharides are sub-classified by carbon number (triose 3C, tetrose 4C, pentose 5C, hexose 6C, heptose 7C) and by functional group — aldose (–CHO) or ketose (>C=O); glucose is an aldohexose, fructose is a ketohexose, ribose is an aldopentose (NCERT §10.1.2, Table 10.1, p. 282).
- Glucose is prepared (1) commercially from starch by boiling with dilute H_2SO_4 at 393 K under 2-3 atm pressure; (2) from sucrose by boiling with dilute HCl/H_2SO_4 in alcoholic solution giving equimolar glucose + fructose (invert sugar) (NCERT §10.1.2.1, p. 282-283).
- Open-chain structure (Fischer projection) of glucose was assigned from: (a) molecular formula $C_6H_{12}O_6$; (b) n-hexane on prolonged heating with HI (proves straight chain of six C); (c) oxime + cyanohydrin formation (carbonyl present); (d) gluconic acid with Br_2 water (aldehydic carbonyl); (e) pentaacetate with acetic anhydride (five –OH on different C); (f) saccharic acid with HNO_3 (oxidation of both terminal carbons, primary –OH at C-6) (NCERT §10.1.2.1, p. 283-284).
- D/L notation refers to the configuration of the lowest asymmetric carbon (C-5 in glucose) relative to D-(+)-glyceraldehyde; in D-(+)-glucose the –OH on the lowest asymmetric C is on the right; D/L is unrelated to optical rotation sign (+/–), e.g., D-(–)-fructose is also a D-sugar though laevorotatory (NCERT §10.1.2.1, p. 284-285).
- Open-chain glucose fails Schiff's test, gives no $NaHSO_3$ addition, pentaacetate gives no oxime with hydroxylamine, and exists as α (m.p. 419 K, $[\alpha]D$ = +112°) and β (m.p. 423 K, $[\alpha]D$ = +19°) crystalline forms — facts explained only by cyclic hemiacetal formation between C-5 –OH and the C-1 –CHO giving a six-membered pyranose ring (NCERT §Cyclic Structure of Glucose, p. 285).
- α- and β-anomers of glucose differ only in configuration of the –OH at C-1 (the anomeric carbon); α has –OH on the same side as D-configuration reference (below ring in Haworth), β on the opposite side; the two cyclic forms exist in dynamic equilibrium with the open chain — basis of mutarotation (equilibrium $[\alpha]D$ = +52.7° starting from either crystal form); the cyclic structure is best shown by the Haworth projection (NCERT §10.1.2.1 Cyclic Structure, p. 285-286).
- Fructose ($C_6H_{12}O_6$) is a D-(–)-ketohexose with a keto group at C-2; it cyclises by addition of C-5 –OH to the keto group forming a five-membered furanose ring; cyclic anomers shown by Haworth structures; in free state fructose is in pyranose form, but in disaccharides like sucrose it exists as furanose (NCERT §10.1.2.2, p. 286).
- Disaccharides are joined by a glycosidic linkage (oxide bridge formed with loss of H_2O between two anomeric –OH groups, or between one anomeric –OH and another –OH); if the reducing groups of both monosaccharides are tied up in the linkage the sugar is non-reducing (sucrose), otherwise reducing (maltose, lactose) (NCERT §10.1.3, p. 287).
- Sucrose = α-D-glucose (C-1) — β-D-fructose (C-2) joined by α,β-1,2-glycosidic linkage; non-reducing because both anomeric centres are tied up; dextrorotatory ($[\alpha]D$ = +66.5°) but on hydrolysis gives D-(+)-glucose (+52.5°) and D-(–)-fructose

(–92.4°); since fructose laevorotation dominates, the hydrolysate is overall laevorotatory and is called invert sugar (NCERT §10.1.3, p. 287).

- Maltose = two α-D-glucose units linked C-1 → C-4 (α-1,4-glycosidic); lactose (milk sugar) = β-D-galactose linked C-1 → C-4 of β-D-glucose (β-1,4); both are reducing because a free aldehyde group can be regenerated at the C-1 of the second sugar (its anomeric –OH is free) (NCERT §10.1.3, p. 287-288).
- Starch is the plant storage polysaccharide; mixture of amylose (water-soluble, 15-20%, unbranched 200-1000 α-D-(+)-glucose units linked by C1–C4 α-glycosidic bonds, gives blue colour with iodine) and amylopectin (insoluble, 80-85%, branched, C1–C4 main chain + C1–C6 branch every 20-25 units, gives violet colour with iodine) (NCERT §10.1.4, p. 288).
- Cellulose is a straight chain polymer of β-D-glucose units joined by C1–C4 β-glycosidic linkages, predominant cell-wall component of plants; humans lack cellulase and cannot digest it; glycogen ("animal starch") is highly branched like amylopectin but more so, stored in liver, muscles and brain; serves as the rapid energy reserve in animals (NCERT §10.1.4, p. 289).
- Carbohydrates serve as energy/storage molecules (starch in plants, glycogen in animals), structural materials (cellulose in cell walls, wood, cotton, chitin in insect exoskeletons), and provide D-ribose and 2-deoxy-D-ribose used in nucleic acids; also provide raw material for industries (textile, paper, sugar, food) (NCERT §10.1.5, p. 289-290).
- Proteins are polymers of α-amino acids; α-amino acids carry $–NH_2$ and –COOH on the same (α) carbon, with –H and an R side chain making the α-C asymmetric (except in glycine where R = H); only α-amino acids are obtained on hydrolysis of natural proteins (NCERT §10.2.1, p. 290).
- Of 20 natural amino acids, ten are essential (must come from diet because humans cannot synthesise them) — valine, leucine, isoleucine, arginine, lysine, threonine, methionine, phenylalanine, tryptophan, histidine — marked with asterisk in Table 10.2; the remaining ten (glycine, alanine, serine, cysteine, tyrosine, asparagine, glutamine, proline, aspartic acid, glutamic acid) are non-essential (NCERT §10.2.2, Table 10.2, p. 290-291).
- Amino acids are acidic (more –COOH than $–NH_2$, e.g., aspartic acid), basic (more $–NH_2$ than –COOH, e.g., lysine) or neutral (equal numbers); they exist as zwitterions/dipolar ions ($–COO^-$ and $–NH_3^+$ on the same molecule) in solid state and at physiological pH; amphoteric (react with both acids and bases); high-melting crystalline solids with appreciable water solubility; except glycine all are optically active (asymmetric α-C); most natural amino acids have L-configuration (NCERT §10.2.2, p. 291-292).
- Peptide linkage = amide bond (–CO–NH–) formed between –COOH of one amino acid and $–NH_2$ of the next, with loss of H_2O; sequence of di-, tri-, tetra-, pentapeptide, polypeptide (>10) and protein (>100 residues, molecular mass >10,000 u, e.g. insulin

= 51 amino acids in two chains A and B linked by –S–S– disulphide bridges) (NCERT §10.2.3, p. 292).

- By molecular shape: fibrous proteins (parallel polypeptide chains, held by H-bonds and disulphide linkages, insoluble in water — keratin in hair/nails, myosin in muscles, collagen in connective tissue) and globular proteins (chains coiled into spherical shapes, usually water-soluble — insulin, albumins in egg/blood, haemoglobin) (NCERT §10.2.3, p. 292-293).
- Four levels of protein structure: (i) Primary — the unique sequence of amino acids linked by peptide bonds; any change destroys biological activity (e.g., sickle cell anaemia from one residue change in haemoglobin); (ii) Secondary — local shape of the polypeptide chain, two types — α-helix (right-handed coiled screw, stabilised by intramolecular H-bonds between >C=O of one residue and –NH– of the residue four units ahead) and β-pleated sheet (chains stretched out side-by-side, antiparallel, intermolecular H-bonds, like silk fibroin); (iii) Tertiary — overall 3-D folding of the entire chain, stabilised by H-bonds, disulphide linkages, van der Waals, hydrophobic and electrostatic forces — gives fibrous or globular shapes; (iv) Quaternary — spatial arrangement of two or more polypeptide sub-units (e.g., haemoglobin has four sub-units — two α and two β chains) (NCERT §10.2.3, p. 293-294).
- Denaturation = loss of biological activity on heating or change of pH (acids/bases) or addition of urea/heavy metals/organic solvents; H-bonds are disturbed, globules unfold and helix uncoils; secondary and tertiary structures are destroyed but the primary structure (sequence) remains intact — that is, the polypeptide backbone is unbroken. Examples: coagulation of egg white on boiling, curdling of milk by lactic acid produced by bacteria (NCERT §10.2.4, p. 294-295).
- Enzymes are biocatalysts; almost all are globular proteins (a few exceptions are RNA-based ribozymes); very specific for a particular substrate and reaction; usually named after the substrate with the suffix –ase (e.g. maltase hydrolyses maltose to glucose; sucrase hydrolyses sucrose; urease hydrolyses urea); they lower activation energy dramatically — sucrose hydrolysis: Ea = 6.22 kJ mol^{-1} (acid) vs 2.15 kJ mol^{-1} (sucrase) (NCERT §10.3 & §10.3.1, p. 295).
- Vitamins are organic compounds required in small amounts in diet whose deficiency causes specific diseases; most cannot be synthesised in the human body (gut bacteria make some vitamin K, B-complex); designated A, B, C, D, ... — "vitamine" came from Funk (1912) from vital + amine, later 'e' was dropped when it was realised many vitamins are not amines (NCERT §10.4, p. 295-296).
- Fat-soluble vitamins (A, D, E, K) dissolve in fat/oil, stored in liver and adipose tissues, deficiency develops slowly; water-soluble (B-complex and C) must be supplied regularly because they are excreted in urine and cannot be stored (except B12, which is stored in liver — uniquely among water-soluble vitamins) (NCERT §10.4.1, p. 296).
- Vitamin-deficiency table: A → xerophthalmia + night blindness; B1 (thiamine) → beri-beri; B2 (riboflavin) → cheilosis (cracking at corners of mouth); B6 (pyridoxine) →

convulsions; B12 (cyanocobalamine) → pernicious anaemia; C (ascorbic acid) → scurvy (bleeding gums); D (calciferol) → rickets (children) / osteomalacia (adults); E (tocopherol) → fragile RBCs + muscular weakness; K (phylloquinone) → increased blood clotting time (NCERT §10.4.1, Table 10.3, p. 296-297).

- Nucleic acids are long-chain polymers of nucleotides (polynucleotides); two types — DNA (deoxyribonucleic acid) and RNA (ribonucleic acid) — present in cell nucleus on chromosomes; responsible for heredity (NCERT §10.5, p. 297).
- Complete hydrolysis yields a pentose sugar, phosphoric acid and N-containing heterocyclic bases; sugar = β-D-2-deoxyribose in DNA, β-D-ribose in RNA. Bases: purines adenine (A) and guanine (G) common to both; pyrimidines cytosine (C) common to both; the fourth base is thymine (T) in DNA and uracil (U) in RNA (NCERT §10.5.1, p. 297-298).
- Nucleoside = base attached via N-glycosidic bond to C-1′ of sugar (e.g., adenosine); nucleotide = nucleoside + phosphate ester at C-5′ (e.g., adenosine monophosphate, AMP); nucleotides are joined by 3′–5′ phosphodiester linkages to give the polynucleotide chain (NCERT §10.5.2, p. 298).
- Primary structure = sequence of nucleotides; secondary structure of DNA = Watson–Crick double helix (1953) — two complementary anti-parallel strands held by H-bonds: A pairs with T via two H-bonds, G pairs with C via three H-bonds. RNA has a single-stranded helix that may fold back on itself; three RNAs — m-RNA (messenger, carries genetic code from DNA to ribosome), r-RNA (ribosomal, structural component of ribosome), t-RNA (transfer, brings amino acids to ribosome) (NCERT §10.5.2, p. 298-299).
- Biological functions: DNA is the chemical basis of heredity, self-duplicates during cell division (replication) and passes identical strands to daughter cells; RNA molecules synthesise proteins under instructions encoded in DNA — DNA → mRNA (transcription) → protein (translation); this is the central dogma of molecular biology (NCERT §10.5.3, p. 300).

2.2 Definitions to memorise

Term	Definition	Page
Carbohydrate	Optically active polyhydroxy aldehydes/ketones or compounds yielding them on hydrolysis	281-282
Monosaccharide	Carbohydrate that cannot be hydrolysed further to a simpler polyhydroxy aldehyde/ketone	282
Oligosaccharide	Carbohydrate yielding 2–10 monosaccharide units on hydrolysis	282
Polysaccharide	Carbohydrate yielding a large number of monosaccharide units on hydrolysis	282
Reducing sugar		282

Term	Definition	Page
	Carbohydrate that reduces Fehling's solution and Tollens' reagent	
Aldose / Ketose	Monosaccharide with an aldehyde / a keto functional group	282
Anomers	Cyclic forms (α and β) differing only at the anomeric C-1 –OH configuration	285
Mutarotation	Spontaneous interconversion of α and β anomers in solution to give equilibrium $[\alpha]D$	285
Pyranose / Furanose	Six- and five-membered cyclic hemiacetal/hemiketal forms of sugars	285-286
Glycosidic linkage	Oxide linkage between two monosaccharides formed by loss of H_2O	287
Invert sugar	Laevorotatory mixture obtained on hydrolysis of dextrorotatory sucrose	287
α-Amino acid	Amino acid in which $-NH_2$ and $-COOH$ are on the same (α) carbon	290
Essential amino acid	Amino acid not synthesised in the body; required from diet (10 in number)	291
Zwitter ion	Dipolar ion of amino acid with $-COO^-$ and $-NH_3^+$ on the same molecule	291
Isoelectric point	pH at which the amino acid is electrically neutral (zwitterion form)	291
Peptide bond	–CO–NH– amide linkage between –COOH of one amino acid and $-NH_2$ of another	292
α-Helix	Right-handed coiled secondary structure stabilised by intramolecular H-bonds	293
β-Pleated sheet	Antiparallel stretched-chain secondary structure stabilised by intermolecular H-bonds	293
Denaturation	Loss of biological activity on disruption of 2° and 3° structure (1° intact) by heat/pH	294-295
Enzyme	Biocatalyst (mostly globular protein) that lowers activation energy of a biochemical reaction	295
Vitamin	Organic compound required in small amounts in diet, deficiency causes specific disease	295
Nucleoside	Base attached to C-1′ of pentose sugar via N-glycosidic bond	298
Nucleotide	Nucleoside + phosphate at C-5′ of pentose sugar	298
Phosphodiester bond	3′–5′ linkage joining nucleotides into polynucleotide chains	298

Term	Definition	Page
Watson-Crick base pairing	A=T (2 H-bonds) and G≡C (3 H-bonds) in DNA double helix	299

2.3 Diagrams / processes to remember

- **Open-chain Fischer projection of D-(+)-glucose (p. 283-284)** — aldohexose with –CHO at C-1, four asymmetric carbons C-2 to C-5, –OH at C-2/C-4/C-5 on the right and at C-3 on the left, terminal $–CH_2OH$ at C-6; D-configuration assigned from C-5 (lowest asymmetric C).
- **Oxidation products of glucose (p. 284)** — gluconic acid (C-1 –CHO → –COOH only, by Br_2 water) confirms aldehyde; saccharic acid (both C-1 and C-6 oxidised to –COOH, by HNO_3) confirms primary –OH at C-6.
- **Haworth pyranose structures of α- and β-D-glucose (p. 285-286)** — six-membered ring with O between C-1 and C-5; α-form has C-1 –OH below the ring plane (trans to C-6 $–CH_2OH$), β-form has it above (cis to C-6 $–CH_2OH$); the C-2, C-3, C-4 –OH groups have fixed orientation.
- **Open-chain structure of D-(−)-fructose and Haworth furanose structures of its α/β anomers (p. 286)** — ketohexose with C=O at C-2, five-membered ring formed between C-2 and C-5; anomeric –OH at C-2 distinguishes α (below) and β (above).
- **Disaccharide linkage diagrams (p. 287-288)** — sucrose has α-Glc C-1 ↔ C-2 β-Fru (both anomeric carbons tied up, non-reducing); maltose has α-Glc C-1 ↔ C-4 α-Glc (one anomeric C free, reducing); lactose has β-Gal C-1 ↔ C-4 β-Glc (one anomeric C free, reducing).
- **Fig. 10.1 α-Helix (p. 293)** — coiled right-handed cylinder showing intramolecular H-bonds (dotted lines) between C=O of residue i and N–H of residue i+4; R-groups project outward; example in keratin.
- **Fig. 10.2 β-pleated sheet (p. 293)** — two anti-parallel stretched chains joined side-to-side by intermolecular H-bonds (C=O ··· H–N), giving the characteristic pleated appearance; example in silk fibroin.
- **Fig. 10.3 Four-level protein structure diagram (p. 294)** — schematic of primary (linear sequence), secondary (helix or sheet), tertiary (compact 3-D fold of single chain), quaternary (multiple subunits assembled, like haemoglobin's 4 chains).
- **Structures of pyrimidine/purine bases (p. 298)** — adenine and guanine (purines, two fused rings); cytosine, thymine, uracil (pyrimidines, single ring); thymine has methyl at C-5, uracil does not.
- **Fig. 10.5 Nucleoside vs nucleotide (p. 298-299)** — nucleoside = base + sugar; nucleotide = nucleoside + phosphate at C-5′; phosphate is the link that connects successive nucleotides in chains.

- **Fig. 10.6 Formation of a dinucleotide by phosphodiester linkage (p. 299)** — 3′-OH of one nucleotide + 5′-phosphate of next, with loss of H_2O.
- **Fig. 10.7 Watson–Crick double-strand helix structure of DNA (p. 299)** — two antiparallel strands wound right-handedly, sugar-phosphate backbone outside, base pairs (A=T, G≡C) inside; helical pitch 3.4 nm with 10 base pairs per turn; diameter 2 nm.

2.4 Common confusions / NTA trap points

- D/L notation does NOT indicate optical rotation: D-(+)-glucose is dextrorotatory but D-(–)-fructose is laevorotatory — the (+/–) signs are independent of D/L (p. 284).
- All monosaccharides — including ketoses like fructose — are reducing sugars (p. 282); students often think only aldoses reduce Tollens'. Fructose isomerises to glucose under basic conditions and then reduces the reagent.
- Sucrose is non-reducing because BOTH anomeric carbons are tied up in the glycosidic bond; maltose and lactose are reducing because only ONE anomeric carbon is engaged (p. 287).
- Starch contains both amylose (unbranched, water-soluble, 15-20%) and amylopectin (branched, insoluble, 80-85%); cellulose is β-linked while starch and glycogen are α-linked — humans digest α-glycosidic starch but not β-glycosidic cellulose (p. 288-289).
- Essential amino acids (10) — Val, Leu, Ile, Arg, Lys, Thr, Met, Phe, Trp, His — are marked with asterisk in Table 10.2; Gly, Ala, Ser, Tyr, Pro etc. are non-essential. Memorise the asterisked list (p. 290-291).
- During denaturation, only secondary and tertiary structures are destroyed — primary structure (amino-acid sequence) remains intact (p. 295). The peptide bonds are NOT broken.
- DNA = deoxyribose + (A, G, C, T) and double helix; RNA = ribose + (A, G, C, U) and single helix. Thymine is in DNA only; uracil is in RNA only (p. 297-299). The two strands of DNA are anti-parallel (one 5′→3′, the other 3′→5′).
- Vitamin B12 is water-soluble but unlike other water-soluble vitamins it CAN be stored in the body (specifically in the liver) (p. 296).
- Glycine is the ONLY non-chiral amino acid (R = H, no asymmetric α-C); all other natural amino acids are optically active (p. 291).
- Most natural amino acids have L-configuration (not D); D-amino acids are found only in bacterial cell walls and some antibiotics (p. 292).
- In Haworth projection of D-glucose, the C-6 –CH_2OH points UP; if you draw it down, you are looking at L-glucose. NTA traps confuse the orientation.
- Cellulose's β-1,4 linkage gives a straight chain that packs into microfibrils via H-bonding — that is why cotton, wood are strong fibres but starch is soft and digestible.

🎯 Practice MCQs

Q1. Which of the following carbohydrates is a non-reducing sugar?

A. Maltose

B. Lactose

C. Sucrose

D. Glucose

Q2. Hydrolysis of sucrose by dilute acid gives an equimolar mixture that is overall laevorotatory, called invert sugar. The dominant cause of inversion of optical rotation is:

A. Dextrorotation of D-(+)-glucose exceeds laevorotation of D-(–)-fructose.

B. Laevorotation of D-(–)-fructose (–92.4°) exceeds dextrorotation of D-(+)-glucose (+52.5°).

C. Both glucose and fructose obtained are laevorotatory.

D. The unhydrolysed sucrose retained is itself laevorotatory.

Q3. The α- and β-forms of D-glucose differ only in the configuration of the –OH group at:

A. C-2, the highest asymmetric carbon

B. C-5, the carbon involved in ring formation

C. C-1, the anomeric carbon

D. C-6, the primary alcoholic carbon

📊 PYQ Alignment

Biomolecules has been a high-yield CUET Chemistry chapter, consistently contributing 8–10 MCQs across 2023-25 papers. NTA favours direct factual questions on classification (reducing vs non-reducing sugars, mono/oligo/polysaccharides), structure (anomeric carbon, pyranose vs furanose, Haworth ring size), amino acid trivia (essential list, zwitterion, denaturation), vitamin–deficiency matching from Table 10.3, and DNA vs RNA differences (sugar, fourth base, single vs double strand).

CUET 2025 — Actual PYQs from this chapter

Q.2 (CUET 2025) The following solutions were prepared by dissolving 1 g of solute in 1 L of solution. Arrange them in decreasing order of molarity. (A) Glucose (M = 180 g mol^{-1}) (B) NaOH (M = 40 g mol^{-1}) (C) NaCl (M = 58.5 g mol^{-1}) (D) KCl (M = 74.5 g mol^{-1}) Options:

- A) (A), (D), (C), (B) B) (A), (B), (D), (C) C) (B), (C), (D), (A) D) (D), (C), (A), (B)

Tests: Biomolecules Answer: Not in extracted key

Q.26 (CUET 2025) Carbohydrate used as storage molecule in plants is:

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

Tests: Biomolecules Answer: Not in extracted key

Q.36 (CUET 2025) Amylose is water soluble part of starch. Percentage solubility is:

- A) 20–30% B) 15–20% C) 30–60% D) 50–70%

Tests: Biomolecules Answer: Not in extracted key

Q.37 (CUET 2025) Example of globular protein: (A) Insulin (B) Keratin (C) Albumin (D) Myosin

- A) — B) — C) — D) —

Tests: Biomolecules Answer: Not in extracted key

Q.38 (CUET 2025) Which interactions occur in β-pleated sheet of proteins?

- A) Ionic bond B) Covalent interaction C) Hydrogen bond D) Banana bond

Tests: Biomolecules Answer: Not in extracted key

CUET 2024 — Actual PYQs from this chapter

Q.5 (CUET 2024) The correct structure of dipeptide Gly-Ala (glycyl alanine) is:

- A) $H_2N–CH_2–CO–NH–CH(CH_3)–COOH$ B) $HOOC–CH_2–NH–CO–CH(CH_3)–NH_2$ C) $HOOC–CH(CH_3)–NH–CO–CH_2–NH_2$ D) $H_2N–CH(CH_3)–CO–NH–CH_2–COOH$

Tests: Biomolecules Answer: Not in extracted key

Q.12 (CUET 2024) Gold number ranges of lyophilic colloids: A = 0.005–0.01 B = 0.15–0.25 C = 0.04–1.0 D = 15–25 Which is best protective colloid?

- A) A B) B C) C D) D

Tests: Surface chemistry (closest module) Answer: Not in extracted key

Q.24 (CUET 2024) Match protein structures: (A) Specific sequence of amino acids (B) Folding due to H-bonding (C) Fibrous proteins (D) Arrangement of multiple polypeptides With: Primary, Secondary, Tertiary, Quaternary structure.

- A) — B) — C) — D) —

Tests: Biomolecules Answer: Not in extracted key

Q.29 (CUET 2024) Which among the following is not an analgesic?

- A) Morphine B) Heroin C) Codeine D) Ranitidine

Tests: Chemistry in everyday life (drugs/sweeteners) Answer: Not in extracted key

Q.43 (CUET 2024) Which electrolyte shows maximum deviation from ideal behaviour?

- A) NaCl B) KCl C) $AlCl_3$ D) Glucose

Tests: Biomolecules Answer: Not in extracted key

CUET 2023 — Actual PYQs from this chapter

Q.11 (CUET 2023) The minimum concentration of an electrolyte in millimoles per litre required to cause precipitation of a sol in two hours is called:

- A) Coagulation value B) Gold number C) Congorubrin number D) Flocculation

Tests: Surface chemistry (closest module) Answer: Not in extracted key

Q.14 (CUET 2023) Aspartame is most successful artificial sweetener but is limited to cold food because:

- A) Control of sweetness is difficult B) Too many calories are released at high temperature C) Releases acetic acid in non-cold medium D) Unstable at cooking temperature

Tests: Chemistry in everyday life (drugs/sweeteners) Answer: Not in extracted key

Q.25 (CUET 2023) Which electrolyte has maximum coagulating value for AgI/Ag^+ sol?

- A) Na_2S B) Na_3PO_4 C) Na_2SO_4 D) NaCl

Tests: Surface chemistry (closest module) Answer: Not in extracted key

Q.31 (CUET 2023) The hormone which controls the processes of burning of fats, proteins and carbohydrates, with liberation of energy in the body is:

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

Tests: Biomolecules Answer: Not in extracted key

Q.37 (CUET 2023) In Freundlich adsorption isotherm, the value of (1/n) is:

- A) 1 in case of chemisorption B) 1 in case of physisorption C) Between 0 and 1 in all cases D) Between 2 and 4 in all cases

Tests: Surface chemistry (closest module) Answer: Not in extracted key