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JEE MAIN BIOMOLECULES — PROTEINS — PYQS

Max. Marks: 36 **Questions:** 9

Section A (MCQ) — 9 questions

Q.1 Identify the incorrect statement about tertiary structure of proteins.

[JEE Main 2026 (Online) 5th April Evening Shift]

(1) They can be fibrous or globular in structure.

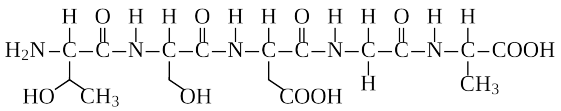
(2) The main forces that stabilize the structure are hydrogen bonding, disulphide links, van der Waals and electrostatic forces of attraction.

(3) The structure remains intact when exposed to pH changes.

(4) A linear polypeptide chain will convert to a secondary structure and then further folding of the secondary structure will convert to tertiary structure.

Scan or tap for the full solution

Q.2 In the given pentapeptide, find out an essential amino acid (Y) and the sequence present in the pentapeptide :



Choose the correct answer from the options given below :

[JEE Main 2026 (Online) 28th January Morning Shift]

	(Y)	(Sequence)
(1)	Serine	Thr–Ser–Asp–Ala–Gly
(2)	Serine	Ser–Asp–Thr–Ala–Gly
(3)	Threonine	Ser–Thr–Asp–Gly–Ala
(4)	Threonine	Thr–Ser–Asp–Gly–Ala

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Q.3 The number of possible tripeptides formed involving alanine (ala), glycine (gly) and valine (val), where no amino acid has been used more than once is:

[JEE Main 2026 (Online) 24th January Evening Shift]

(1) 8 (2) 3 (3) 4 (4) 6

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Q.4 The correct statements are :

A. Activation energy for enzyme catalysed hydrolysis of sucrose is lower than that of acid catalysed hydrolysis.

B. During denaturation, secondary and tertiary structures of a protein are destroyed but primary structure remains intact.

C. Nucleotides are joined together by glycosidic linkage between C_1 and C_4 carbons of the pentose sugar.

D. Quaternary structure of proteins represents overall folding of the polypeptide chain.

Choose the correct answer from the options given below :

[JEE Main 2026 (Online) 21st January Evening Shift]

(1) A, B and D Only (2) A, C and D Only

(3) B and C Only (4) A and B Only

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Q.5 Given below are two statements :

Statement-I: On hydrolysis, oligo peptides give rise to fewer number of α-amino acids while proteins give rise to a large number of β-amino acids.

Statement-II: Natural proteins are denatured by acids which convert the water soluble form of fibrous proteins to their water insoluble form.

In the light of the above statements, choose the most appropriate answer from the options given below :

[JEE Main 2025 (Online) 7th April Evening Shift]

(1) Statement-I is incorrect but Statement-II is correct

(2) Both Statement-I and Statement-II are incorrect

(3) Both Statement-I and Statement-II are correct

(4) Statement-I is correct but Statement-II is incorrect

Scan or tap for the full solution

Q.6 Identify the pair of reactants that upon reaction, with elimination of HCl will give rise to the dipeptide Gly-Ala.

[JEE Main 2025 (Online) 4th April Morning Shift]

(1) $NH_2–CH_2–COOH$ and $NH_2–\overset{\overset{CH_3}{|}}{C}H–COOH$

(2) $NH_2–CH_2–COCl$ and $\overset{\oplus}{N}H_3–\overset{\overset{CH_3}{|}}{C}H–COCl$

(3) $NH_2–CH_2–COCl$ and $NH_2–\overset{\overset{CH_3}{|}}{C}H–COOH$

(4) $NH_2–CH_2–COOH$ and $NH_2–\overset{\overset{CH_3}{|}}{C}H–COCl$

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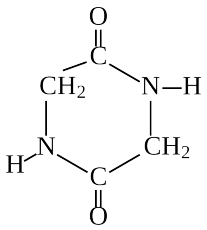
Q.7 A dipeptide, "x" on complete hydrolysis gives "y" and "z". "y" on treatment with aq. HNO_2 produces lactic acid. On the other hand "z" on heating gives the following cyclic molecule.



Based on the information given, the dipeptide "x" is : [JEE Main 2025 (Online) 4th April Evening Shift]

(1) alanine-alanine (2) valine-glycine

(3) valine-leucine (4) alanine-glycine

Scan or tap for the full solution

Q.8 A tetrapeptide, "x" on complete hydrolysis produced glycine (Gly), alanine (Ala), valine (Val), leucine (Leu) in equimolar proportion each. The number of tetrapeptides (sequences) possible involving each of these amino acids is:

[JEE Main 2025 (Online) 2nd April Evening Shift]

(1) 32 (2) 24 (3) 8 (4) 16

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Q.9 The α-Helix and β- Pleated sheet structures of protein are associated with its :

[JEE Main 2025 (Online) 23rd January Evening Shift]

(1) tertiary structure (2) quaternary structure

(3) primary structure (4) secondary structure

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9		
Ans.	3	4	4	4	2	3	4	2	4		