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Course outline
How does an NPTEL online course work?
Week 1
Week 2
Lecture 06 : Primary Structure
Lecture 07 : Secondary Structure
Lecture 08 : Tertiary and Quaternary Structure
Lecture 09 : Protein Interactions
Lecture 10 : Discussion Class
Week 2 Lecture Material
Quiz : Week 2 : Assignment 2
Week 2 Feedback Form
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Detail Solution
Live Interactive session

Week 2 : Assignment 2

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

Due on 2021-08-18, 23:59 IST.

1) In an aqueous solution, there are several factors responsible for the adoption of a specific protein conformation. Of the two **major** factors, one is the formation of the maximum number of hydrogen bonds. The other is the: 1 point

a) formation of the maximum number of hydrophobic interactions.
b) minimization of entropy by the formation of a water solvent shell around the protein.
c) placement of hydrophobic amino acid residues within the interior of the protein.
d) placement of polar amino acid residues around the exterior of the protein.

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

2) Which of the following pairs of bonds within a peptide backbone show free rotation around both bonds? 1 point

a) C_α–C and N–C_α
b) C=O and N–C_α
c) N–C and C_α–C
d) N–C_α and N–C

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

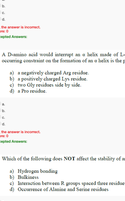
3) A sequence of amino acids in a certain protein is found to be -Ser-Gly-Pro-Gly-. The sequence is **most** probably part of a : an 1 point

a) antiparallel β-sheet
b) α-helix
c) parallel β-sheet
d) β turn

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

4) In the contact map identify the regions marked **X**, **Y** and **Z** 1 point



a) X- Antiparallel β-sheet; Y- α-helix; Z- Parallel β-sheet
b) X- Parallel β-sheet; Y- α-helix; Z- Antiparallel β-sheet
c) X- α-helix; Y- Parallel β-sheet; Z- Antiparallel β-sheet
d) X- Antiparallel β-sheet; Y- Parallel β-sheet; Z- α-helix.

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

5) Glycine and proline are the most abundant amino acids in the structure of 1 point

a) Hemoglobin
b) Collagen
c) Myroglobin
d) Insulin

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

6) A Domino acid would interrupt an α helix made of L-amino acids. Another common naturally occurring constraint on the formation of an α helix is the presence of: 1 point

a) a negatively charged Arg residue.
b) a positively charged Lys residue.
c) two Gly residues side by side.
d) a Pro residue.

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

7) Which of the following does **NOT** affect the stability of an α-helix? 1 point

a) Hydrogen bonding
b) Ballooning
c) Interaction between R groups spaced three residues apart
d) Occurrence of Alanine and Serine residues

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

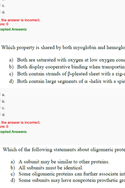
8) The quaternary structure is possible for a protein only when 1 point

a) the amino acid cysteine is present
b) all amino acids have nonpolar R groups.
c) two or more polypeptide chains are present.
d) a protein chain bends back upon itself

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

9) 1 point



In the above image, choose the correct option that represents A, B, C structure of proteins respectively. The chains are colour coded.

a) Primary, Secondary, Quaternary
b) Secondary, Tertiary, Quaternary
c) Primary, Secondary, Tertiary
d) Primary, Tertiary, Quaternary

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

10) The most important contribution to the stability of the protein conformation appears to be due: 1 point

a) sum of free energies of formation of many weak interactions between its polar amino acids and surrounding water.
b) sum of free energies of formation of many weak interactions among the loadends of amino acids in a protein.
c) entropy increase from the reduction in ordered water molecules forming a solvent shell around it.
d) maximum entropy increases from ionic interactions between the ionized amino acids in a protein.

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

11) The formation of _____ is determined by _____ interactions, whereas the formation of _____ is strongly influenced by _____ interactions. 1 point

a) α-helices, short-range; β-strands, long-range
b) α-helices, long-range; β-strands, short-range
c) α-helices, long-range; α-helices, short-range
d) β-strands, short-range; β-strands, long-range

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

12) Which property is shared by both myoglobin and hemoglobin? 1 point

a) Both are saturated with oxygen at low oxygen concentrations.
b) Both display cooperative binding when transporting oxygen.
c) Both contain strands of β-pleated sheet with a zig-zag shape.
d) Both contain large segments of α-helix with a spiral shape.

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

13) Which of the following statements about oligomeric proteins is **INCORRECT**: 1 point

a) A subunit may be similar to other proteins.
b) All subunits must be identical.
c) Some oligomeric proteins can further associate into large fibers.
d) Some subunits may have nonprotein prosthetic groups.

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

14) Which among the following combinations of torsion angles is **CORRECT**: 1 point

a) N-C_α = Ψ, C_α-C = φ, Peptide bond = ω
b) C_α-C = Ψ, Peptide bond = φ, N-C_α = ω
c) Peptide bond = ω, N-C_α = φ, C-C = Ψ
d) C_α-C = ψ, N-C_α = ω, Peptide bond = Ψ

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

15) Which of the following is not true about secondary protein structure? 1 point

a) The hydrophilic/hydrophobic character of amino acid residues is important to secondary structure
b) The ability of peptide bonds to form intramolecular hydrogen bonds is important to secondary structure
c) The alpha helix, beta pleated sheet and beta turns are examples of protein secondary structure
d) The steric influence of amino acid residues is important to secondary structure

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

16) Identify the amino acid shown and state in which direction the propagation of the polypeptide chain is correct? 1 point

a) The amino acid shown is Val and the direction is from Left to Right
b) The amino acid shown is Leu and the direction is from Left to Right
c) The amino acid shown is Leu and the direction is from Right to Left
d) The amino acid shown is Val and the direction is from Right to Left

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

17) Determination of the precise spacing of atoms within a large protein is possible only through the use of: 1 point

a) a Ramachandran plot.
b) molecular model building.
c) x-ray diffraction.
d) a contact map.

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

18) In an α helix, the R groups on the amino acid residues: 1 point

a) are found on the outside of the helix spiral.
b) generate the hydrogen bonds that form the helix.
c) stack within the interior of the helix.
d) alternate between the outside and the inside of the helix.

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

19) Which of the following is not observed in a contact map? 1 point

a) α-Helices appear as thick bands along the main diagonal
b) parallel β-sheets appear as thin bands parallel to the main diagonal.
c) α-Helices appear as thin bands perpendicular to the main diagonal.
d) anti-parallel β-sheets appear as thin bands anti-parallel to the main diagonal.

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

20) Indicate which secondary structure or structures the following peptide is likely to adopt in an aqueous solution at pH 7. 1 point

Gly-Ala-Gly-Ala-Gly-Ser-Ala-Gly-Ser-Gly-Ala

a) α-helix
b) β-pleated sheets
c) Random coil
d) Turns

a.
b.
c.
d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.