CSIR NET 2019 JUNE

307. Which one of the following statements on protein conformation, detailed below is INCORRECT?

(a) L-amino acids can occur in Type I' β-turns where Φ, □ are both positive.

(b) A peptide rich in proline is unlikely to adopt α-helical structure.

(c) Proline residues have a high propensity to occur in β-turns.

(d) The dihedral angles Φ, □ of amino acids in unfolded proteins are exclusively positive.

308. Choose the INCORRECT statement from the following statements made for an enzyme catalyzed reaction:

(a) The kinetic properties of allosteric enzymes do not diverge from Michaelis-Menten behavior.

(b) In feedback inhibition, the product of the pathway inhibits an enzyme of the pathway.

(c) An antibody that binds tightly to the analog of the transition state intermediate of the reaction S → P. would promote formation of P when the analog is added to the reaction.

(d) An enzyme with K_{cat} = 1.4 x 10^{4} S^{-1} and

K_m = 9x10^{-5}M has activity close to the diffusion controlled limit.

309. The first step in glycogen breakdown releases glucose units as:

(a) Glucose 6-phosphate

(b) Glucose 1-phosphate

(c) Glucose

(d) Glucose and Glucose 6-phosphate

310. A multimeric protein when run on an SDS gel showed 2 bands at 20 kDa and 40 kDa. However, when the protein was run on a native gel, it showed a single band at 120 kDa. The native form of the protein would be:

(a) Homotrimer

(b) Heterotetramer

(c) Heterodimer

(d) Heterotrimer

311. A solution contains NADH and NAD', both at 0.1 concentration. If NADH has a molar extinction coefficient of 6220 and that of NAD' is negligible, the optical density measured in a cuvette of 5 mm path length will be:

(a) 0.62

(b) 0.062

(c) 0.31

(d) 0.031

312. The emission maximum of tryptophan fluorescence in a protein is -335 nm. This suggests that tryptophan:

(a) Is in a hydrophobic environment.

(b) Occurs in a helical segment.

(c) Has proximal cysteine residues.

(d) Is oxidized

313. Equal volumes of pH 4.0 and pH 10.0 solutions are mixed. What will be the approximate pH of the final solution ?

(a) 7.0

(b) 5.0

(c) 6.0

(d) 4.0

314. The inborn error of amino acid metabolism, alkaptonuria, is due to the lack of one of the following enzymes:

(a) Fumarylacetoacetate hydrolase

(b) α- keto acid decarboxylase

(c) Homogentisate oxidase

(d) p-hydroxyphenylpyruvate hydroxylase

315. The structure of a protein with 100 residues was determined by X-ray analysis at atomic resolution and NMR spectroscopy. The following observations are possible:

A. The dihedral angles determined from the X-ray structure and NMR will be identical.

B. The dihedral angles determined from the X-ray structure will be more accurate.

C. β-turns can be determined only by NMR.

D. β-sheets can be more accurately determined from the X-ray structure.

Indicate the combination with ALL correct answers.

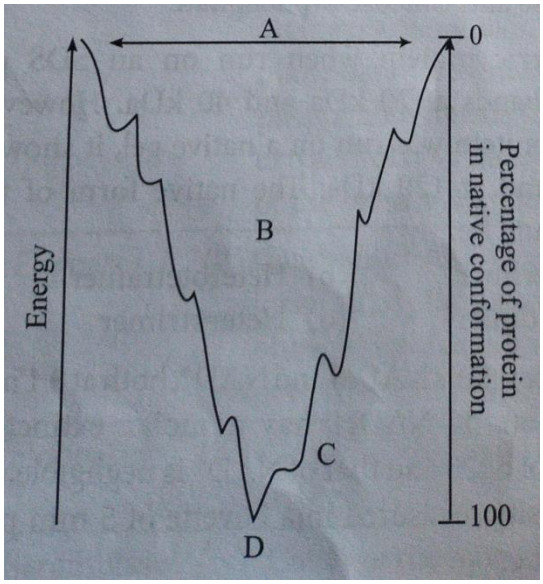
(a) A and C

(b) B and D

(c) B and C

(d) A and D

316. Thermodynamics of protein folding is depicted as a free energy funnel below:



Given below are regions in the diagram (Column X) and their representations (Column Y).

Column X	Column Y
A.	(i) Native structure
B.	(ii) Structure with highest entropy
C.	(iii) Molten globule
D.	(iv) Discrete folding intermediates

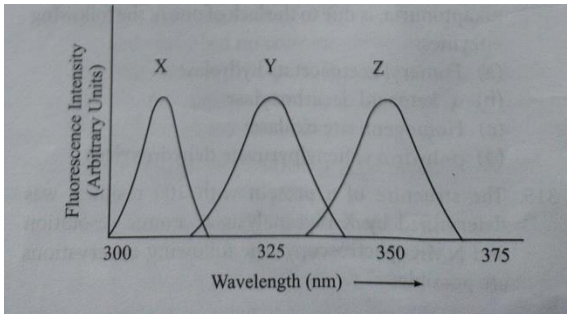
Choose the option that shows all correct matches.

(a) A (ii); B (iii); C (iv) and D - (i)

(b) A (i); B (ii); C (iii) and D (iv)

(c) A (iii); B (iv); C (ii) and D (i)

(d) A (iv); B (i); C (ii) and D - (iii)



The above figure shows the fluorescence emission spectra of three different proteins: protein (X). protein (Y) and protein (2) excited at 280 nm.

Which one of the following statements gives the CORRECT interpretation?

(a) Proteins (Y) and (Z) have tryptophan while protein (X) has only phenylalanine.

(b) Protein (X) has only tyrosine and protein (Y) has tryptophan on the surface while protein (Z) has tryptophan buried inside.

(c) Protein (X) has tryptophan buried inside while proteins (Y) and (Z) have tryptophan on the surface.

(d) Protein (X) has only tyrosine and protein (Y) has tryptophan buried and protein (Z) has tryptophan on the surface.