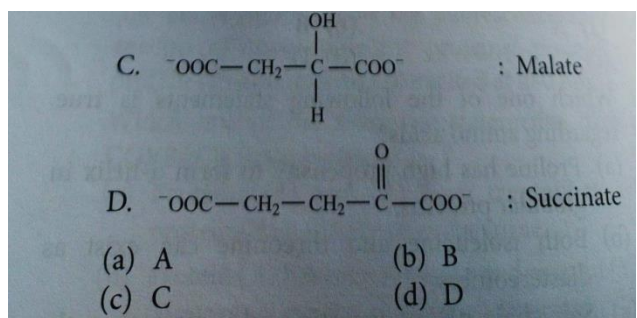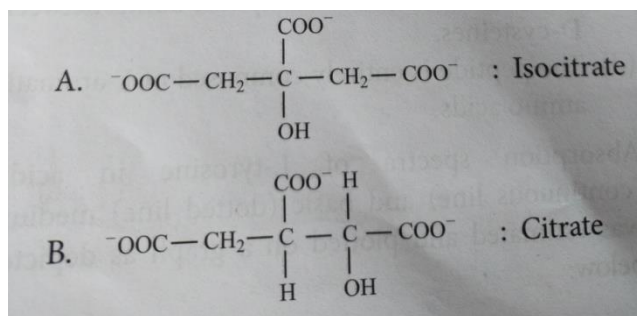325. Which one of the statements given below is correct?

(a) The Ramachandran plots of Acetyl-L- AlaCONHMe and acetyl-D-Ala CONHMe will be identical.

(b) Fe is - transition metal but Ca is not.

(c) Side chain pK, of L-Glu and D-Glu will not be identical.

(d) Hydrogen bonds are fundamentally van der Waals interactions.

326. The molecules citrate, isocitrate, malate and succinate take part in the citric acid cycle. Identify the structure with the correct name.

A. $^-OOC-CH_2-C(COO^-)(OH)-CH_2-COO^-$: Isocitrate

B. $^-OOC-CH_2-C(COO^-)(H)-C(H)(OH)-COO^-$: Citrate

C. $^-OOC-CH_2-C(OH)(H)-COO^-$: Malate

D. $^-OOC-CH_2-CH_2-C(=O)-COO^-$: Succinate

(a) A   (b) B
(c) C   (d) D

327. Following are statements on enzyme kinetics. Choose the correct statement.

(a) Sufficiently high concentrations of substrate cannot completely relieve competitive inhibition.

(b) Sufficiently high concentrations of substrate can relieve non-competitive inhibition.

(c) Allosteric nature of an enzyme cannot be inferred from a plot of reaction velocity and substrate concentration.

(d) For an enzyme following Michaelis-Menten kinetics, the initial velocity is determined at the beginning when enzyme-substrate dissociation is insignificant.

328. A 30-residue peptide containing Phe, Tyr and Trp is dissolved in D_2O and the high field proton NMR is recorded after 24 hours. The resonances that are unlikely to be present are:

(a) Aromatic protons

(b) Ca protons

(c) Aliphatic protons

(d) Amide protons

329. Following are statements related to biophysical chemistry of molecules:

A. When solute is dissolved in a solvent, the increase in boiling point is independent of the number of particles into which the solute dissociates and dependent only on the molarity of solute.

B. When two atoms are linked by a covalent bond, van der Waals interaction between them contributes substantially to the bond energy.

C. If a plot of reactant concentration versus time is not linear, but a plot of 1/reactant concentration versus time is linear, the reaction is of second order.

D. Glucose, tyrosine and tryptophan can be easily distinguished by analyzing their UV spectra at equimolar concentration

Choose the combination with correct statements.

(a) A and C

(c) and B

(b) B and D

(d) C and D

330. Following are statements related to peptide/protein conformation:

A. The circular dichroism spectra of collagen and a protein in a-helical conformation will be identical.

B. The allowed region for the dihedral angles φ, in Gly spans a large area in the Ramachandran map. This can be drastically reduced by substituting the two hydrogens with methyl groups.

C. Proline has a high frequency of occurrence in β-turns.

D. In a β-hairpin structure, the dihedral angles φ,of amino acids flanking the region will be ~-60°, respectively.

Choose the combination with both INCORRECT statements.

(a) B and C

(b) A and B

(c) A and D

(d) C and D

331. An allosteric enzyme has two heterotropic effectors, X and Y. The allosteric constant, L for the enzyme in the absence of effector molecules is 180. For the X-saturated form, the value of L increases from 180 to 1200, while for Y-saturated form it decreases to 60.

What kind of effector molecules are x and Y?

(a) X and Y both are positive regulators.

(b) X is a negative regulator while Y is a positive regulator.

(c) X is a positive regulator while Y is a negative regulator.

(d) X and Y are not allosteric regulators.

332. An enzyme follows Michaelis-Menten kinetics. The activity of the enzyme was measured in the presence or absence of a molecule, "X: Given below are the double reciprocal equations for the enzyme activity with or without "X:

(i) Without molecule

(ii) With molecule

What kind of molecule is "X? Select from the options given below?

(a) Temperature-independent competitive inhibitor

(b) Temperature-dependent competitive inhibitor

(c) Non-competitive inhibitor

(d) Uncompetitive inhibitor

333. A and B Two cell surface receptors, A and B with a single binding site specifically bind with their respective ligands, X and Y. In the table below are the values for the association constant, K, of the respective ligand-receptor interactions. K, is also called the affinity constant.

Receptor	Ligand	K_a
A	X	1×10^8
B	Y	1×10^{11}

Based on these values, which one of the following statements is INCORRECT?

(a) K_d for B-Y binding is smaller than that for A binding

(b) K_1 for A-X binding is lesser than that for B-Y binding

(c) K_{-1} for B-Y binding is smaller than that for A-X binding

(d) K_{-1}/K_1 for B-Y binding is higher than that for A-X binding (K_1 is the forward rate constant, K_{-1} is the reverse rate constant and K_d is the dissociation constant)

334. Given below are some statements made on the buffering capacity of hemoglobin (Hb) in contributing to acid-base balance in the body:

A. Hb buffering capacity is due to large number of histidine residues

B. Imidazole groups of Hb dissociate less than those of oxyhaemoglobin (HbO_2)

C. Hb buffering capacity is due to large number of threonine residues

D. Hb is a strong acid

Which one of the following options represents a combination of CORRECT statements?

(a) A and B

(b) B and C

(c) C and D

(d) A and D