

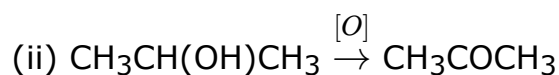


Case Based Questions

Solution 1

(i) In both aldehydes and ketones, the geometry around the carbon atom in the carbonyl group is trigonal planar; the carbon atom exhibits sp^2 hybridization. Two of the sp^2 orbitals on the carbon atom in the carbonyl group are used to form σ bonds to the other carbon or hydrogen atoms in a molecule.

Hence, the correct answer is option b.



Oxidation of secondary alcohols leads to the formation of ketones.

Hence, the correct answer is option c.

OR

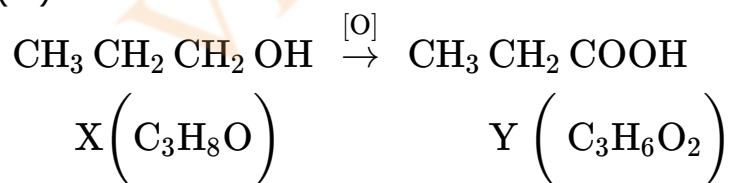
(ii) KMnO_4 in acidic medium oxidizes primary alcohols directly to carboxylic acids. Hence, it cannot oxidize primary alcohols to aldehydes.

Hence, the correct answer is option b.

(iii) As the number of alkyl groups increases, the +I effect increases and the polarity of carbonyl group decreases as the charge on carbonyl carbon decreases. Therefore, HCHO is the most polar carbonyl compound.

Hence, the correct answer is option d.

(iv)



Hence, the correct answer is option c.

Solution 2

(i) Due to adsorption to dye on the solid surface, intensity of the colour of the

solution decreases when activated carbon is stirred into a dilute solution of dye. Therefore, assertion is correct and reason is the correct explanation for assertion.

Hence, the correct answer is option a.

(ii) In chemisorption, chemical bond formation takes place between adsorbate and adsorbent. Large amount of heat is required to break these chemical bonds i.e. enthalpy of chemisorption is large. Whereas, in physisorption, the adsorbate and adsorbent molecules are held together by weak van der Waals' forces of attraction and less amount of energy is required to break such bonds.

Therefore, assertion is a wrong statement but reason is the correct statement.

Hence, the correct answer is option d.

(iii) Temperature and rate of physical adsorption are inversely related. As the temperature increases, rate of adsorption decreases. Therefore, assertion is correct but reason is wrong.

Hence, the correct answer is option c.

(iv) NH_3 will be more readily absorbed on the surface of the charcoal. This is because the critical temperature of ammonia gas is quite high than that of carbon dioxide. Hence, it easily combines with the materials than the carbon dioxide whether it is solid, liquid or any gas. Also, ammonia is a polar molecule. Therefore, assertion is correct but the reason is wrong.

Hence, the correct answer is option c.

OR

(iv) Silica gel has a property of adsorbing moisture from air and hence, is used for drying air. Therefore, assertion and reason both are correct and reason is the correct explanation for assertion.

Hence, the correct answer is option a.

Solution 3

(i) In a particular colloidal system, all particles carry either positive or negative charge. When a colloidal solution is subjected to an electric field, movement of charges towards anode and cathode takes place. Therefore, assertion is correct but reason is wrong.

Hence, the correct answer is option c.

(ii) The particle size of true solution is too small to show Tyndall effect. Tyndall effect is shown by colloidal particles as its particle size lie between that of true solution and suspension. Therefore, assertion is wrong but reason is correct.

Hence, the correct answer is option d.

(iii) Brownian Movement is said to be the random zig-zag motion of a particle that is usually observed under high power ultra-microscope. This movement resembles the exact motion of pollen grains in water as explained by Robert Brown, hence, the name Brownian movement. It is shown by colloidal particles

when the molecules of dispersion medium interacts with the colloidal particles. Therefore, assertion is correct and reason is correct explanation for assertion. Hence, the correct answer is option a.

(iv) The colloidal particles of dust can scatter blue light and hence, sky appears blue in colour. Therefore, assertion is correct and reason is the correct explanation for assertion. Hence, the correct answer is option a

OR

(iv) Colloidal particles have a unique property of scattering a beam of light. This phenomena is known as Tyndall effect. When a beam of light is passed through a colloidal solution in a dark place, the colloidal particles scatter the beam of light and the path becomes visible. Therefore, assertion and reason both are correct and reason is the correct explanation for assertion. Hence, the correct answer is option a.

Solution 4

(i) Beta pleated sheet is an example of the secondary structure of a protein. Beta sheets are of two forms i.e. anti-parallel and parallel. Hence, the correct answer is option b.

(ii) In beta pleated sheets, hydrogen bond exists between polypeptide chains that are arranged parallelly. Hence, the correct answer is option c.

OR

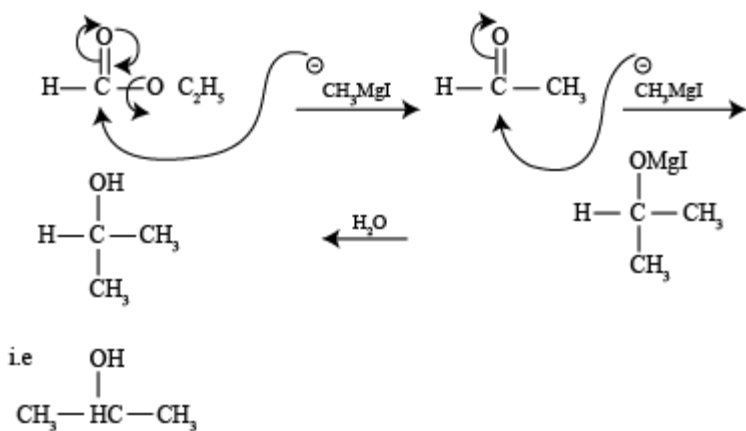
(ii) A tripeptide consists of 3 amino acids and 2 peptide bonds. Hence, the correct answer is option b.

(iii) All the statements regarding proteins are true. Hence, the correct answer is option d.

(iv) The bond formed between two amino acids is known as a peptide bond. When a bond is formed between two or more amino acids (-CONH-) linkage is formed which is known as peptide bond linkage. Hence, the correct answer is option b

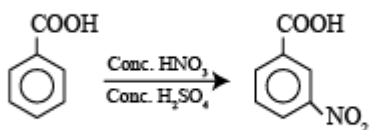
Solution 5

(i)



Hence, the correct answer is option C.

(ii)



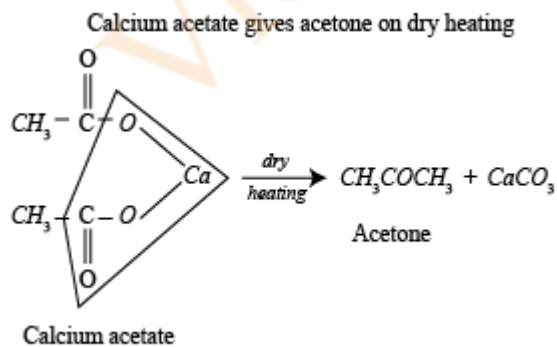
Hence, the correct answer is option D.

OR

(ii) For the synthesis of esters from carboxylic acids and alcohols, acid can be used as a catalyst and not a base.

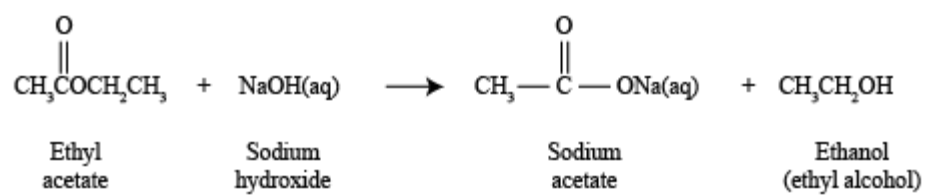
Hence, the correct answer is option A.

(iii)



Hence, the correct answer is option C.

(iv)



Hence, the correct answer is option B.