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Assignment Title: Vitamins and coenzymes

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Question

1a. what are coenzymes Coenzymes are non-protein organic molecules that are mostly derivatives of vitamins soluble in water by phosphorylation; they bind apoenzyme to proteins to produce an active holoenzyme. Coenzymes participate in enzyme-mediated catalysis in stoichiometric amounts; they are modified during the reaction, and may require another enzyme-catalyzed reaction to restore them to their original state. Examples include Nicotinamide adenine dinucleotide (NAD), which accepts hydrogen and ATP, which gives up phosphate groups while transferring chemical energy. Most of the vitamin Bs are coenzymes and are essential in enabling the transfer of atoms or groups of atoms between molecules in the formation of carbohydrates, fats, and proteins.

b. Differentiate between fat and water soluble vitamins

1. Fat soluble vitamins are soluble in fat while water soluble vitamins are not soluble in fat
2. Fat soluble vitamins are not soluble in water while water soluble vitamins are soluble in water
3. In Fat soluble vitamins absorption of fat soluble vitamins along with lipids and require bile salt while the absorption of water soluble vitamins is simple
4. Fat soluble vitamins are stored in the live while water soluble vitamins are not stored in the body
5. Deficiency of fat soluble vitamins when stored fat soluble vitamin are depleted while deficiency of water soluble vitamins is likely and rapid as there is no storage

c. Describe niacin in relation to its coenzymic function

Niacin is also called nicotinic acid and vitamin B3; it is a water-soluble vitamin of the B complex. It is also called the pellagra-preventive vitamin because an adequate amount in the diet prevents pellagra, a chronic disease characterized by skin lesions, gastrointestinal disturbance, and nervous symptoms. Niacin is interchangeable in metabolism with its amide, niacinamide (Nicotinamide). Like the vitamins thiamin (vitamin B1) and riboflavin (vitamin B2), niacin functions as part of a coenzyme involved in the metabolism of carbohydrates and acts to catalyze the oxidation of sugar derivatives and other substances.