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**Dept: PHARMACOLOGY**

**Course : BCH204**

**Questions : 1a. What are coenzymes;** 1)- Coenzymes are small molecules and they cannot by themselves catalyze a reaction but they can help enzymes to do so. In technical terms, coenzymes are organic nonprotein molecules that bind with the protein molecule (apoenzyme) to form the active enzyme (holoenzyme).

**b. Differentiate between fat and water soluble vitamins;** ( I) Water soluble are absorbed in the portal blood, readily excreted in the urine, and they act as co-enzymes to catalyze activity in the body. Fat soluble absorbed in lymphatic system, stored in tissues, & have a hormone-like function.

II) Fat-soluble vitamins are soluble in fats. They are absorbed by fat globules that travel through the small intestines and into the general blood circulation within the body. Unlike water-soluble vitamins, fat-soluble vitamins are stored in the body when they are not in use. Typically, they are stored in the liver and fat tissues. Although only small amounts of these vitamins are necessary to maintain good health, Vitamin D deficiency has been reported as a growing public health concern. It has been associated with an increased risk of certain diseases. Fat-soluble vitamins include Vitamin A (palmitate form), Vitamin D, Vitamin E and Vitamin K .While;

Water-soluble vitamins dissolve in water, which means these vitamins and nutrients dissolve quickly in the body. Unlike fat-soluble vitamins, water-soluble vitamins are carried to the body’s tissues, but the body cannot store them. Any excess amounts of water-soluble vitamins simply pass through the body. Because these vitamins are needed by our bodies, we need to make sure we intake these vitamins on a regular basis. Water soluble vitamins include Vitamin C and the vitamin B complex: thiamin (B1), riboflavin (B2), niacin (B3), pantothenic acid (B5), Vitamin B6, biotin (B7), folic acid (B9), Vitamin B12. Vitamin A in its Beta-Carotene form is also water-soluble.

**c. Describe niacin in relation to its coenzymic function;** Vitamin B3, generally referred to as niacin, is a water-soluble vitamin. This vitamin can generally be found in two distinctive forms, namely nicotinic acid and nicotinamide. These substances are used by the body to form the coenzymes NAD and NADP. Niacin coenzymes degrade carbohydrates, fats, proteins and alcohols and synthesize fatty acids and cholesterol. They play a role in cell signaling.

FUNCTIONS OF NIACIN

Niacin assists functions of the nervous and digestive system. It plays a role in food metabolism and in the formation of red blood cells and skin. NAD and NADP are coenzymes that are part of the energy production system of the body. This system works by means of oxidation and reduction (redox) reactions. Niacin deficiency occurrence causes many symptoms, such as fatigue, headaches, dry skin, loss of appetite, ulcers and emotional instability. On rare occasions (mainly in developing countries) people may experience severe deficiency, which leads to a condition known as pellagra. This conditions is commonly characterized by the 4 D's: dermatitis, diarrhoea, dementia and death. Pellagra literally means raw skin. The conditions was named this because the skin of a patient develops a dark pigmented rash on areas exposed to ultravioletnt radiation .