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COURSE TITLE: MEDICAL BIOCHEMISTRY II

ASSIGNMENT ON VITAMINS AND COENZYMES

Answer

1a) Coenzymes are organic compounds, additional non-protein components that are loosely bound to and required by enzymes for optimum activity.

1b) Difference between fat soluble vitamins and water soluble

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| --- | --- |
| Fat soluble | Water soluble |
| They are soluble in fat | They are soluble in water |
| They are stored in the liver | They are not stored |
| Deficiencies occur as soon as stored ones are depleted | Deficiencies can occur any time as they are no storage, so are needed by diet regularly |
| Toxicity when storage is full | No toxicity as excess is removed |
| Absorption requires bile salt | Easy Absorption |
| Carrier proteins present | No carrier protein |
| Examples include Vitamin A,D,E and K | Examples include B complex vitamins and Vitamin C |

1c) Niacin in relation to its coenzymic function

Niacin (vitamin B3) is a water soluble vitamin. Active form of Niacin: **Nicotinamide Adenine dinucleotide (NAD+)** and **Nicotinamide Adenine dinucleotide phosphate (NADP+)** . **NAD+** and **NADP+** acts as a coenzymes in catalysing oxidation reduction reactions in oxidative pathways that are catalysed by dehydrogenase.

They are, therefore involved in many metabolic pathways of carbohydrate, lipid and protein. Generally, **NAD+**linked dehydrogenases catalyse oxidation-reduction reactions in **oxidative pathways,** e.g. citric acid cycle and glycolysis. While **NADP+**linked dehydrogenases or reductases are often found in pathways concerned with **reductive synthesis*,*** e.g. synthesis of cholesterol, fatty acid and pentose phosphate pathways.