

# BIOCHEMISTRY ASSIGNMENT

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**MATRIC NO: 17/MHS01/257**

**DEPT: MBBS**

**TOPIC: DIABETES, OBESITY AND CANCER**

## QUESTION 1

**Define the following terms:**

- A. KETOGENESIS:** is the biochemical process through which organisms produce ketone bodies through breakdown of fatty acids and ketogenic amino acids. This process supplies energy under circumstances such as fasting or caloric restriction to certain organs, particularly the brain, heart and skeletal muscle.
- B. KETONAEMIA:** The presence of an abnormally high concentration of ketone bodies in the blood.
- C. KETONURIA:** is a medical condition in which abnormally large amounts of ketone bodies are present in the urine. It is seen in conditions in which the body produces excess ketones as an indication that it is using an alternative source of energy. It is seen during starvation or more commonly in type 1 diabetes mellitus or other medical conditions.
- D. KETOGENESIS:** is a metabolic pathway that produces ketone bodies, which provide an alternative form of energy for the body.

## QUESTION 2

**What are the consequences of Ketosis?**

**Ketosis** is a metabolic state in which fat provides most of the fuel for the body. It occurs when there is limited access to glucose (blood sugar), which is the preferred fuel source for many cells in the body.

## Consequences:

- **Ketoacidosis:** For people with **diabetes**, ketosis can trigger a dangerous condition called ketoacidosis. This occurs when the body stores up too many ketones—acids produced as a byproduct of burning fat—and the blood becomes too acidic, which can damage the liver, kidneys, and brain. Left untreated, it can be fatal.
- **Hypercholesterolemia:** During ketosis, the liver produces fewer triglycerides, which may be involved in raising HDL **cholesterol levels**. However, the ketosis may raise LDL **cholesterol levels** in some people which can lead to other complications.
- **Kidney stones:** Ketosis can put stress on the kidneys and possibly give you kidney stones.

## QUESTION 3

### Write concisely on the management of ketoacidosis.

Ketoacidosis is a metabolic state caused by uncontrolled production of ketone bodies that cause a metabolic acidosis (blood becomes acidic).

### Management/ Treatment:

- **Fluid replacement.** The patient will receive fluids — either by mouth or through a vein (intravenously) — until he is rehydrated. The fluids will replace those lost through excessive urination, as well as help dilute the excess sugar in the blood.
- **Electrolyte replacement.** Electrolytes are minerals in the blood that carry an electric charge, such as sodium, potassium and chloride. The absence of insulin can lower the level of several electrolytes in the blood. The patient will receive electrolytes through a vein to help keep the heart, muscles and nerve cells functioning normally.
- **Insulin therapy.** Insulin reverses the processes that cause diabetic ketoacidosis. In addition to fluids and electrolytes, the patient will receive insulin therapy — usually through a vein. When blood sugar level falls to about 200 mg/dL (11.1 mmol/L) and the blood is no longer acidic, he may be able to stop intravenous insulin therapy and resume normal subcutaneous insulin therapy.