



Benha University
Faculty of Science
Department of Zoology

Semester: First semester
Date: 18/1/2020
Exam time: 2:00 h

Level: Third level
Sepec: Zoology & Chemistry- Biochemistry

Physiology 1 (313 Z)

C- Define the following: (6 marks)

- 1- **Glycolysis:** is the oxidation of glucose into pyruvic acid (in the presence of oxygen) or lactic acid (in absence of oxygen).
- 2- **Glycogenolysis:** It is the breakdown of glycogen to glucose in the liver and glucose-6-phosphate in the muscle due to absence of glucose-6-phosphatase enzyme.
- 3- **Ketolysis:** Breakdown of ketone bodies in the brain, muscle and other tissues to acetyl-CoA, which oxidize in the Krebs cycle to give energy, H₂O and CO₂

D- What is the fate of: (6 marks)

- 1- Acetyl CoA:
 - Enter Krebs cycle.
 - Formation of ketone bodies (ketogenesis).
 - Used to reform fatty acids.
- 2- Ammonia:
 - Biosynthesis of urea is the main fate of ammonia.
 - Small amounts of ammonia are excreted in urine.
 - Biosynthesis of glutamic acid, nonessential amino acids and glutamine.
- 3- Glucose:
 - Glucose oxidation.
 - Glycogenesis.
 - Lipogenesis.
 - Lose in urine (in special conditions).

E- Mention only one of the two mechanisms for amino acids absorption?

(4 marks)

1- Carrier proteins transport system: It is the main system for amino acid absorption. Absorption of one amino acid molecule needs one ATP molecule. There are seven carrier proteins, one for each group of amino acids. Each carrier protein has two sites one for amino acid and one for Na^+ . It co-transportes amino acid and Na^+ from intestinal lumen to cytosol of intestinal mucosa cells. The absorbed amino acid passes to the portal circulation, while Na^+ is extruded out of the cell in exchange with K^+ by sodium pump.

Or

2- Glutathione transport system (γ -Glutamyl cycle): Glutathione is used to transport amino acids from intestinal lumen to cytosol of intestinal mucosa cells. Absorption of one amino acid molecule needs 3 ATP molecules. Glutathione reacts with the amino acid in the presence of γ -glutamyl transpeptidase to form γ -glutamyl amino acid. γ -glutamyl amino acid releases amino acid in the cytosol of intestinal mucosa cells with formation of 5-oxoproline that is used for regeneration of glutathione to begin another turn of the cycle.