

## Typical correction for the first semester exam (regular session)

### I. Define the following: (06 points)

#### - **Chlorophyll:**

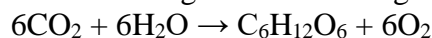
They are green pigments found in plants, and are among the most important pigments active in the process of photosynthesis.

#### - **Aerobic respiration:**

It is a set of metabolic reactions and processes that occur in the cells of living organisms to convert chemical energy from nutrients into ATP, and then release waste.

#### - **Photosynthesis:**

It is a vital process through which light energy is converted into chemical energy potential within the molecules of organic matter according to the following equation:



### II. Choose the correct answer: (04 points)

- ◆ Which micronutrient is involved in the synthesis of chlorophyll and plays a crucial role in photosynthesis?

X - A) Iron (Fe)

- B) Manganese (Mn)

- C) Zinc (Zn)

- D) Boron (B)

- ◆ What is the primary role of molybdenum (Mo) in plants?

- A) Synthesis of nucleic acids

X - B) Nitrogen fixation

- C) Carbohydrate metabolism

- D) Regulation of water balance

- ◆ Which mechanism involves the physical contact and absorption of mineral elements by the growing root system?

- A) Mass flow

X - B) Root interception

- C) Active transport

- D) Diffusion

◆ What percentage of dry weight in healthy plants is attributed to Carbon?

- A) 6%

X - B) 45%

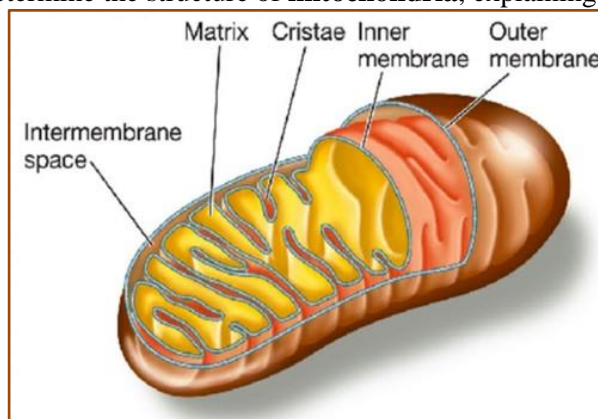
- C) 1.5%

- D) 0.1%

III. Complete the answer: (3.5 points)

- The enzyme responsible for converting glucose into two molecules of pyruvate is: pyruvic acid
- The two stages of oxidative phosphorylation are: Electron Transport Chain and Chemiosmosis
- The importance of Oxidative phosphorylation stage is: Consumption of  $O_2$
- The stages of Transformation of Pyruvate into Acetyl-CoA are:
  - Carboxyl group gets removed, forming  $CO_2$ .
  - $NAD^+$  gets reduced to NADH
  - Coenzyme A gets attached to acetate, forming acetyl COA

IV. With an illustration, determine the structure of **mitochondria**, explaining its organelles.(2.5 points)



**Figure:** The structure of a mitochondrion.

V. What is the role of **Carotenoids** in the process of photosynthesis: (01 points)

- Absorption and transfer of energy to chlorophyll A.
- Protection of chlorophyll from photo-oxidation.

VI. What are the products of the photochemical phase in the process of photosynthesis. (01 points)

- $NADPH^+ + H^+$  and ATP

VII. What are **the electron carriers in photosynthesis** present at the level of the thylakoid membrane? (02 points)

- plastoquinone Pq, cytochrome Cyt, plastocyanin Pc, ferredoxin Fd, and ferredoxin reductase Fdr