

Benha University

Pre-master Exam.

Faculty of science

January 2016/2017

Botany department

Plant Enzymes & Hormones

Answer on the following questions:

Q1: Define the following:

1- Enzyme

2- prosthetic group

3- Plant regulators

4- Flowering hormones

Q2: Explain the distribution of enzymes.

Q3: Discuss the gibberellin and auxin interaction

Q4: Write short notes:

1- Effect of substrate concentration on enzyme activity.

2- Synthetic auxins

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Model answer

1-

- 1- Enzyme is a protein molecule and are biological catalyts. Enzymes increase the rate of the reaction. Enzymes are specific.
- 2- prosthetic group an organic radical, nonprotein in nature, which together with a protein carrier forms an enzyme.
- 3- Plant regulators:- They are organic compounds other than nutrients that in small amounts promote, inhibit, or otherwise modify a physiological process in plants
- 4- Flowering hormones. a hormone produced by leaves that stimulates flowering in plants.

2-

Explain the distribution of enzymes.

An **exoenzyme**, or **extracellular enzyme**, is an enzyme that is secreted by a cell and functions outside of that cell. Exoenzymes are produced by both prokaryotic and eukaryotic cells and have been shown to be a crucial component of many biological processes. Most often these enzymes are involved in the breakdown of larger macromolecules. The breakdown of these larger macromolecules is critical for allowing their constituents to pass through the cell membrane and enter into the cell.

An **endoenzyme**, or **intracellular enzyme**, is an enzyme that functions within the cell in which it was produced. Because the majority of enzymes fall within this category, the term is used primarily to differentiate a specific enzyme from an exoenzyme. It is possible for a single enzyme to have both endoenzymatic and exoenzymatic functions.

3- The gibberellin and auxin interaction

Response activity	Auxins	Gibberellins
1-apical dominance	promote	No effect
2-avena coleoptile elongation	promote	No effect
3-bolting and flowering	No effect	promote
4-growth of dwarf pea stem sections	promote	No effect

5-leaf abscission	promote	No effect
6-parthenocarpic	promote	Promote
7-polar transport	Yes(stems) no effect (roots)	No effect
8-root initiation	promote	No effect
9-root growth	promote	No effect
10-seed germination	No effect	promote

4-

1- Substrate concentration:

when other factors are limiting, the rate of any enzyme catalyzed reaction usually increase with increase in the concentration of the substrate up to a certain maximum, after which the relative amount acted upon per unit of time decreases with increase in the substrate concentration. this is due to:

a- reversibility of the reaction

b- production of inhibitory products.

c-gradual inactivation of the enzyme by impurities in the system.

d- furthermore as the concentration of the dissolved or dispersed substrate in a reaction mixture increases.

2- The structures of common synthetic auxins

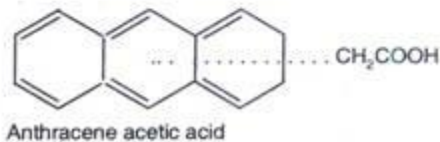
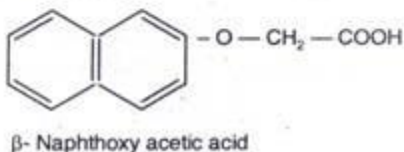
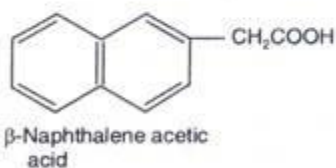
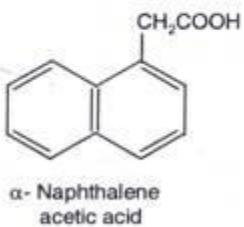
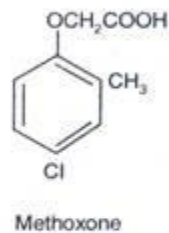
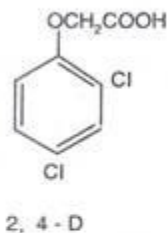
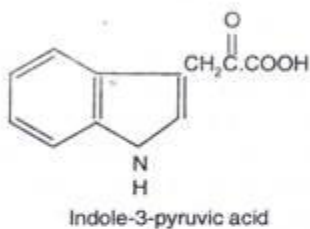
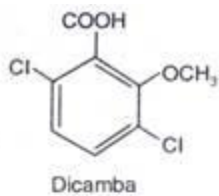
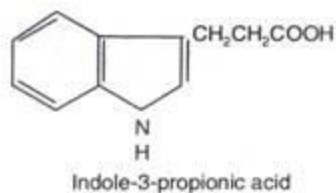


Fig. 17.39. Structures of some common synthetic auxins.

(Some chemical compounds which were previously included in synthetic auxins Such as IBA (Indole-3-butyric acid) and 4-Cl-IAA (4-chloro indole-3-acetic acid) have now been isolated from plant parts and are now considered as natural auxins and are therefore, not included in synthetic auxins).