REVIEW QUESTIONS PAGE: 88

A. MULTIPLE CHOICE TYPE

(Select the most appropriate option in each case)

1. A plant hormone related with inhibition of senescence is

(a) Ethylene **(b) ABA**

(c) Bromic acid **(d) GA**

Solution:-

(d) GA

2. Apical dominance phenomenon is caused by

(a) auxins **(b) GA**

(c) cytokinins **(d) ABA**

Solution:-

(a) auxins

3. Which of the following hormones regulate stomatal closure?

(a) auxins **(b) GA**

(c) ABA **(d) cytokinins**

Solution:-

(d) Cytokinins

4. Auxins are abundantly produced in:

(a) base of the root **(b) base of the shoot**

(c) shoot **(d) meristematic region of the shoot**

Solution:-

(d) meristematic region of the shoot

5. A higher concentration of ethylene is found in:

(a) green banana **(b) ripe banana**

(c) fresh potato tuber **(d) green apple**

Solution:-

(b) ripe banana

6. Common gibberellin is

(a) GA_1 **(b) GA_2**

(c) GA_3 **(d) GA_7**

Solution:-

(c) GA_3

7. Stems are:
(a) positively geotropic and negatively phototropic
(b) positively geotropic and positively phototropic
(c) negatively geotropic and positively phototropic
(d) negatively phototropic and negatively geotropic
Solution:-
(c) negatively geotropic and positively phototropic

8. In tropic movements, plant parts move
(a) away from the stimulus
(b) towards the stimulus
(c) either towards or away from the stimulus
(d) only towards water
Solution:-
(c) either towards or away from the stimulus

B. SHORT ANSWER TYPE
1. Match the items in column A with those of column B.

Column A	**Column B**
(a) Auxin	**(i) apical dominance**
(b) Gibberellin	**(ii) cell-division**
(c) Cytokinin	**(iii) fruit ripening**
(d) Ethylene	**(iv) Internodal elongation**

Solution:-

Column A	**Column B**
(a) Auxin	(i) apical dominance
(b) Gibberellin	(iv) Internodal elongation
(c) Cytokinin	(ii) cell-division
(d) Ethylene	(iii) fruit ripening

2. Differentiate between:
(a) Thigmotropism and geotropism
Solution:-

Thigmotropism	Geotropism
The growth movement of plants in response to touch stimulus is called thigmotropism. Some interesting response are seen in response to touch.	The term geotropism means growing towards the earth's gravity. It also called gravitropism. Organs which grow towards the gravity are positively geotropic and those that grow away from the gravity are negatively geotropic.

(b) Phototropism and chemotropism
Solution:-

Phototropism	Chemotropism
Phototropism means movement towards light. The plants grown in light illuminating them from all direction grow more or less upwards.	Chemotropism is the phenomenon of growth of plant organs in response to chemicals.

3. How is the movement in plants different from that of animals?
Solution:-
Movement of body parts are common in animals, but in plants, movements are seen in the form of bending, twisting and elongation of certain parts. These movements are caused due to changes in the external as well as the internal factors of a plant. Such changes either in the external or internal environment of an organism are called stimuli and resulting actions or movements caused by the stimuli are called response.

4. Name the stimulus which cause the following movements in plants:
Phototropism, thigmotropism, hydrotropism and geotropism.
Solution:-
Phototropism means movement towards light.
Thigmotropism is the growth movement of plants in response to touch stimulus.
Hydrotropism is the movement of plant parts in response to water or moisture.
Geotropism means growing towards the earth's gravity.

5. Name the following.
(a) Hormone that stimulates growth by cell division.
Solution:-
Hormone that stimulates growth by cell division is cytokinin.

(b) Growth retarding hormone in plants.
Solution:-
Growth retarding hormone in plants is abscisic acid.

(c) Main auxin found in most plants.
Solution:-
IAA (Indole 3-acetic acid)

C. LONG ANSWER TYPE
1. What are tropic movements? Briefly explain various types of tropic movements in plants.
Solution:-
Growth movements occurring in response to unidirectional external stimuli in a plant part are called tropic movements.
The types of tropic movements in plant are,
(1) Phototropism:-

Phototropism means movement towards light. The plants grown in light illuminating them from all directions grow more or less upwards. But if the light is brighter on one side of the plant than another (unilateral light), then the shoot of the plant will bend towards the increased light and the roots, if they are exposed, will grow away from it.

(2) Geotropism:-

The term geotropism means growing towards the earth's gravity. It is also called gravitropism. Organs which grow towards the gravity are positively geotropic and those that grow away from the gravity negatively geatropic.

(3) Hydrotropism

The movement of plant parts in response to water or moisture is called hydrotropism. When a plant part grows towards the source of moisture, it is said to be positively hydrotropic. The growth of roots towards moisture ensures that roots will be near the water available in the soil.

(4) Thigmotropism:-

The growth movement of plants in response to touch stimulus is called thigmotropism. Some interesting response are seen in response to touch. Plants such as sweet peas, cuscuta and vines have tendrils which coil around other plants in response to one sided contact or touch. Stimulus is perceived by tendril tips and then it is transmitted to basal parts.

(5) Chemotropism

Chemotropism is the phenomenon of growth of plant organs in response to chemicals. The movement of pollen-tube of angiosperms and gymnosperms towards sugars and peptones secreted by neck canal cells of the female gametophyte is an example of chemotropism.

2. List five plant growth hormones and briefly describe their roles.
Solution:-
The five plant growth hormones are,
(1) Auxins
(a) Auxins promote the growth of stem, roots and fruits by cell elongation.
(b) Auxins delay leaf senescence (ageing).
(c) Auxins promote the growth of apical buds and inhibit the growth of lateral buds.
(2) Gibberellins
(a) The main function of gibberellins is to promote the growth of internodes by cell elongation.
(b)Gibberellins break seed dormancy and initiate germination.
(c) They promote fruit growth and are capable of inducing parthenocarpy.
(3)Cytokinins
(a) Cytokinins stimulate plant growth by cell division as against and gibberellins which stimulate growth by cell elongation.
(b) In seeds, cytokinins cause expansion of cotyledons.
(c) They promote chlorophyll synthesis in chloroplasts and delay leaf senescence.
(4) Ethylene
(a) Ripening of fruits.
(b) Initiating germination in peanut seed.
(c) Sprouting of potato tuber.
(5) Abscisic acid (ABA)
(a) Abscisic acid act as a general plant growth inhibitor by slowing down plant metabolism.
(b) ABA inhibits seed germination and development.
(c) It accelerates senescence and abscission of leaves, buds, flowers and fruits.

3. The response of plants to gravity is known as geotropism. How are plant parts sensitive to gravity? Describe with the help of a diagram.
Solution:-

The term geotropism means growing towards the earth's gravity. It also called gravitropism. Organs which grow towards the gravity are positively geotropic and those that grow away from the gravity are negatively geotropic. The response of plants to gravity can be observed in the laboratory when seedling are placed in a pot filled with moist soil.

4. What is meant by positive and negative tropic movements in plants? Explain them by giving suitable examples.

Solution:-

Positive tropic movement in plants means direction of movement of plant towards the stimulus.

Examples:- (1) The plants grown in light illuminating them from all directions grow more or less upwards.

(2) Roots growing towards the earth's gravity.

Negative tropic movement in plants means direction of movement of plant away from the stimulus.

Examples:- (1) Growth of roots away from the light

(2) Roots growing away from the earth's gravity.

5. With the help of an experiment, prove that roots are more positively hydrotropic than geotropic.

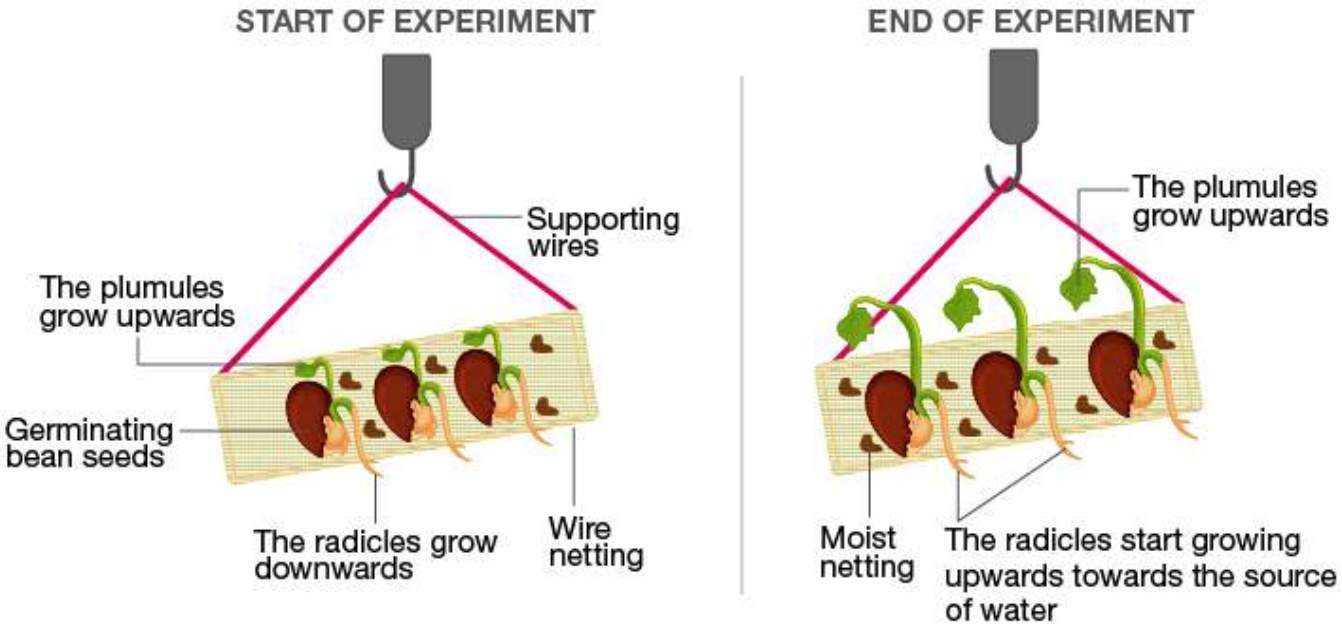
Solution:-

To investigate the effect of water on the growth of roots and shoots.

First take a piece of wire netting or gauze. Suspended it by means of wires. Moist sawdust (around one inch) is placed on the wires netting and some germinating bean seeds are embedded in the sawdust.

As the seeds germinate, the radicles initially grow downwards through the wires netting under the influence of gravity. But soon, they start growing upwards, towards the moist sawdust, which is the only source of water. In doing so, they grow against the force of gravity. The shoots grow upwards all the time.

This experiment shows that the roots grow towards water and shoots do not. For the roots, water is a more effective stimulus than gravity.



D. STRUCTURED/APPLICATION/SKILL

1. The tea plants are never allowed to grow lengthwise. This is done by cutting their apical buds, a process known as pruning. In this way, tea plants get a dense growth and easy yield. Answer the following questions:

(a) Name the scientific phenomenon that is being overcome by pruning.

Solution:-

The scientific phenomenon that is being overcome by pruning is apical dominance.

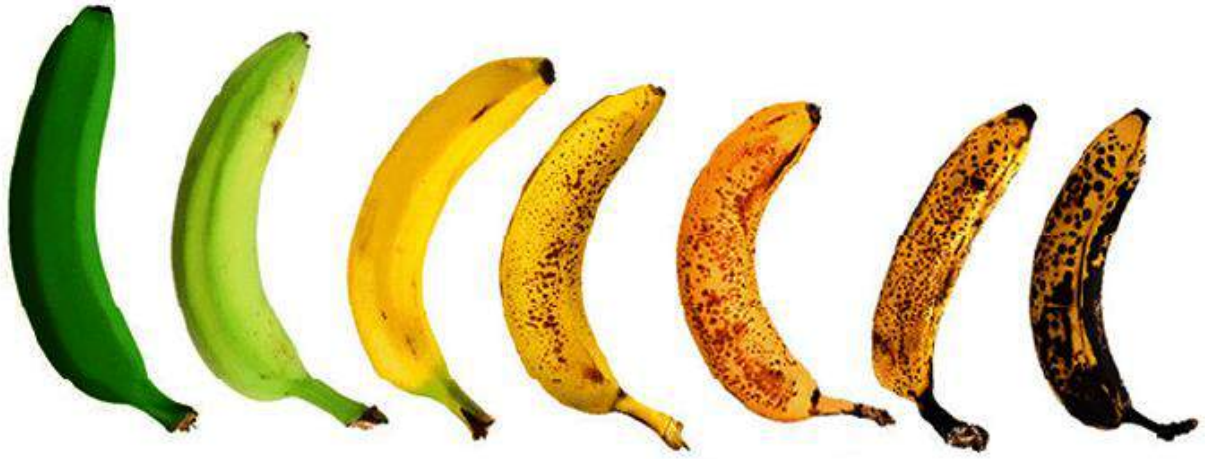
(b) What plant hormone is responsible for the scientific phenomenon mentioned in (a).

Solution:-

Auxin is the plant hormone responsible for the scientific phenomenon mentioned in (a).

(c) Name one plant hormone which inhibits the said phenomenon.
Solution:-
Cytokinins is the plant hormone which inhibits the said phenomenon.

2. The figure given below shows the stages of ripening in a banana. Answer the questions that follow:



(a) Name the plant hormone responsible for the above changes.
Solution:-
The plant hormone responsible for the above changes is Ethylene.

(b) Mention two characteristic features of this hormone.
Solution:-
Ethylene causes two process in plants reduction in stem elongation and acceleration of senescence, and also it helps in,
(1) Ripening of fruits.
(2) Initiating germination in peanut seeds.
(3) Sprouting of potato tuber.
(4) Promoting root growth and root-hair formation.