CBSE Class 11 Biology

Important Questions

Chapter 15

Plant Growth and Development

1 Marks Questions

1.What is growth?

Ans. Irreversal permanent increase in size of an organism.

2.Which hormone act as "stress hormone"?

Ans. Abscisic acid (ABA)

3.Name a non-acidic growth substance.

Ans. Kinetin.

4.What is aleurone layer?

Ans. It is special tissue layer which surrounds the endosperm in maize grain.

5.Name the growth regulator which was first isolated from corn kernel and coconut milk?

Ans. Zeatin (Cytokinin) was first isolated from corn kernel and coconut milk.

6.What is the full form of IAA?

Ans. Indole Acetic Acid.

7.Name the hormone which is responsible for elongation of intermodal regions of green plants.

Ans. Ethylene

8.Would a defoliated plant respond to photoperiodic cycle? Why?

Ans. No as the site of perception is the leaves so it will not respond to photoperiodic cycle.

9.Mention the names of two such substances that cause seed dormancy?

Ans. Abscissic acid and phenolic acid.

10.Write the cause of 'Bakane' disease of rice.

Ans. Gibberalla fujikuroi.

11.Name the plant hormone which was first is from human urine.

Ans. Auxin

12.Name the only gaseous & plant hormone.

Ans. Ethylene

13.How does abscise acid acts as stress hormone in drought condition

Ans. ABA causes rapid closure of stomata, preventing loss of water by transpiration.

14.A famer observed some broad-leaved weeds in a wheat crop farm. Which plant hormone would you suggest remove them?

Ans. 2.4-D

15.Why do lateral buds start developing into branches whena apical bud is removed?

Ans. Due t0 inhibit activity of Auxin lateral growth starts.

16.Flowering in certain pIant occur only when they are expos to low temperature for a few weeks. name this phenomenon.

Ans. Vernalisation

17.Name the hormone released from over-ripe that affects all other apples in a small wooden box.

Ans. Ethylene.

CBSE Class 12 Biology
Important Questions
Chapter 15
Plant Growth and Development

2 Marks Questions

1.What would happen to tissue culture of parenchyma if-

a) Auxin and cytokinin were present in equal quantities.

b) More cytokinin than auxin was present.

c) More auxin than cytokinin was present

Ans. i) cells divide but do not differentiate

ii) shoot buds develop from the callus.

iii) Root develop.

2.Define vernalization?

Ans. The term vernalization is promoter of flowering by a previous cold treatment. In flowering plant, plants requiring cold treatment usually behave as biennials. They germinate and grow vegetative in first season and produce flower in second season.

3.What is heterophylly?

Ans. The plants follow various pathways in response to environment / phase of life to form different kind of structures. It is known as plasticity. Some examples are heterophylly in cotton, coriander and larkspur. The leaves of juvenile plants are different in shape from those in mature plant. Difference in the shapes of leaves produced in air and those produced in water in buttercup also represent the heterophyllous development due to environment. The phenomenon of heterophylly is an example of plasticity in plants.

4.'Both growth and differentiation in higher plants are open' comment.

Ans. Growth and differentiation in plants are open as all the cells as well as the tissues arising from the same meristem may possess different structures at maturity. The maturity is determined by the location of cells or tissues e.g. it may be at shoot apex, root apex. Cambium etc.

5.What is bolting? Which hormone is responsible for it?

Ans. Enormous elongation of inter nodes resulting increase in stem height. Gibberellins cause the plants to bolt and flower.

6.Why is the term short plants a misnomer?

Ans. These plants require a relatively short day light period usually 8-10 hours and a continous dark period of about 14-16 hours for flowering. In short day plants dark period is critical and must be continuous. They are known as long Night plants and the term short day plant is a misnomer with long night plants.

7. Explain the role played by phytohormone in seed germination.

Ans. It is a regulatory pigment which controls several light dependent developmental processes in plants besides seed germination. Phytohormones exist in two inter convertible forms : Pr and P_{fr}. On absorbing red light Pr becomes P_{fr} and P_{fr} becomes P_r either rapidly by absorbing far red light or slowly in darkness. Germination is promoted by P_{fr} and red light is needed to promote this. Darkness (far-red) promotes P_r formation which induces dormancy and inhibits germination.

8.What is 'Bioassay'?

Ans. A bioassay is the evaluation of the effect of a substance on living organism under controlled conditions.

9.Name any two synthetic auxins. How are they used in agriculture.

Ans. Two synthetic auxins are

(i) Naphthalene Acetic Acid (NAA)

(ii) In dole Butyric Acid (IBA)

They are used as weedicides

10. How will you induce lateral branching in a plant which normally does not p them? Give reason.

Ans. When apical bud is removed, lateral branches are produced. Removal of apical bud affect the auxin is destroyed inducting the lateral buds to grow rapidly.

11. What is meant by abscission ? Name the phytohormone involved in it.

Ans.

• Premature fall of leaf and fruit is called abscission.

* Abscisic acid

CBSE Class 12 Biology
Important Questions
Chapter 15
Plant Growth and Development

3 Marks Questions

1.What are the conditions necessary for growth?

Ans. The necessary conditions for growth are water, oxygen and nutrients. The plant cell grows in size by cell enlargement that needs water. The plant growth and further development are intimately liked to water status of plants. Water provides medium for enzymatic activities needed for growth O_2 helps in releasing metabolic energy for growth.

Nutrients both macro and micro essential elements are needed by plants for synthesis of the protoplasm. Moreover, they act as source of energy.

Every plant has an optimum temperature range best suited for its growth. Any deviation from it may be detrimental to its survival. Environmental signal like light and gravity also influence various phases or stages of growth in plaints.

2.What does the sigmoid growth curve of a population mean?

Ans. In biological organization growth occurs at many levels, from the molecular level upto the ecosystem level. It can be measured at different levels such as the growth of cell organism or population. If it is measured in length, area, volume, mass or number of cells or individuals and plotted against time, and s-shaped curve is obtained. This is known as sigmoid curve. An analysis of this curve shows a lag phase during which slow growth occurs. This gradually attains a rapid growth, followed by a period of slow growth and ultimately a decline called stationary phase. Since the same patterns of growth is sigmoid curve observed at all levels of organization it is said to be universal.

3.Differentiate between photoperiodism and vernilisation?

Ans.

	Photoperiodism	Vernilization
a	Photoperiodism is the flowering response of the plants to the duration of light and dark period in the diurnal cycle.	Vernalisation prepares the plants for perceiving stimulus for flower induction by chilling treatment.
b	In this stimulus perceived by green leaves only.	Stimulus is perceived by young embryos, meristems and even leaves.
c	In this florigen is produced under photoinductive conditions.	Vernalin is produced by chilling treatment.
d	Photoperiodic induction cannot be reversed by exposing to non-inductive conditions.	Vernalisation can be reversed when maintained higher temperature
e	GA3 has the capability to replace the requirements of photo-inductive conditions in long day plants only.	GA3 can replace cold treatment to induce vernalisation.

4.Discuss the statement : 'The growth is measurable'

Ans. The growth (at a cellular level) is basically a consequence of increase in the amount of protoplasm. Since we cannot measure growth directly it is measured by some quantity that is more or less proportional to it so the growth is measured by a variety of parameters like increase in fresh weight; dry weight; length; area; volume and cell number etc. One single maize root apical meristem may give rise to more than 17,500 new calls per hour. The cells in a watermelon can increase in size by upto 3,50,000 times. Therefore, growth may be expressed as increase in cell number or as increase in size of cell. The growth of a pollen tube is measured in terms of length. An increase in surface area measures growth in a dorsiventral leaf or dicot leaf.

5.What is apical dominance name the hormone that controls it.

Ans. "The inhibition of growth of lateral buds into the branches in the presence of an apical bud."

Apical dominance is under the control of auxins IAA (indole acctic acid) is the principal auxin found in all the plants. Lateral buds start their development when apical bud is removed. The process is again reversed if you apply IAA to decapitulate apex of plant.

6.Write the principal characteristics of PGR's.

Ans. Characteristics – PGRs are small, simple molecules of diverse chemical structure occurring in plants. They are indole compounds (indole 3 acetic acid, IAA); adenine derivatives CN^6 of (arotenoids) and the fatty acids (abscisic acid, ABA); terpenes (gibberllic acid, GA3) or gases (ethylene, C_2H_4). PGR's are called plant growth substances or plant hormones.

They are broadly divided into two groups based on their function in a living plant body:-

a) On group of PGR's involved in growth promoting activities, e.g, cell division, cell enlargement, pattern formation, tropic growth, flowering, fruiting and seed formation. They also termed plant growth promoter e.g. auxons, gibberellins, cytokinins.

b) PGR's of other group are in plant responses to wounds and stresses of biotic and abiotic origin. These may be involved in different growth inhibiting activities like dormancy and abscission; e.g, abscissic acid (ABA). The gaseous PGR is ethylene. It is inhibitor of growth activities mostly.

7. What would be expected to happen if :

(a) GA_3 is applied to rice seedling.

(b) a rotten fruit get mixed with unripe fruits.

(r) you forget to add cytokinin to the culture medium.

Ans. (a) Hyper elongation of internodes of rice seedlings will occur.

(b) Unripe fruits will lea to early ripening and ultimately it will result in rottening.

(c) Short but formation will not occur.

CBSE Class 12 Biology
Important Questions
Chapter 15
Plant Growth and Development

5 Marks Questions

1.What is photoperiodism? How do you categories the angiosperms on the basis of their flowering response.

Ans. Photoperiodism – The phenomenon of inducing flowering in plants with response to length of daily period of light or relative day & night length is call photoperiodism.

The angiosperms are classified into the following three categories on the basis of photoperiodism.

(i) short day plants (SDP) – They require a relating short day length than critical period for flowers e.g chrysanthemum, Nicotiana, soyabean.

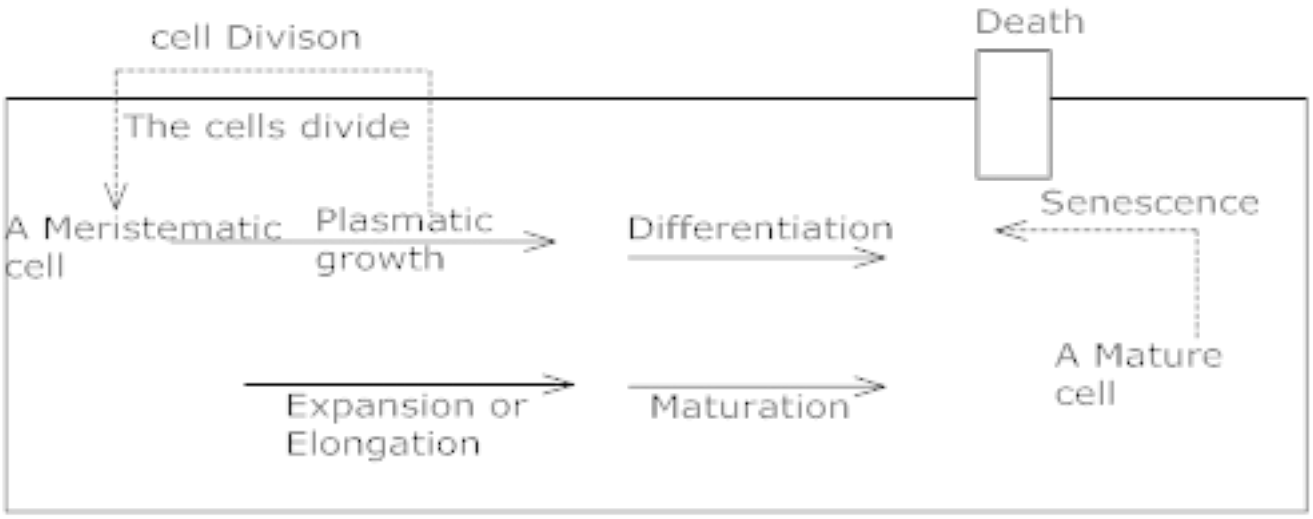
(ii) Long day plants (LDP) – They require a relating longer day length than critical period for flowing e.g. wheat, Maize, Radish.

(iii) Day neutral Plants (DNP) – The flowering response in their plants remain unaffected by the length of day. These plants are also called as photoneutrals or indifferent plants e.g. Cotton, Pea, Tomato & sunflower.

2. i) What do you understand by the tem Development?

ii)Explain the sequence of development process in a plant cell.

Ans. It is a term “that includes all changes that an organism goes through during its life cycle from germination of the seed to senescence.” Diagrammatic representation of the sequence of processes in development of a cell of a higher plant.



Sequence of the development process in a plant cell.

3.How is growth measured in plants?

Ans. Growth in plants is measured by are indicator arc auxanometer. Pfeffer's auxanometer have two wheels attached to a stem. The lip of the potted plant is connected to small pulley and its other end is strengthened to a weight. A pointer is attached to a big pulley by weight and also to a cylinder having smoothed paper.

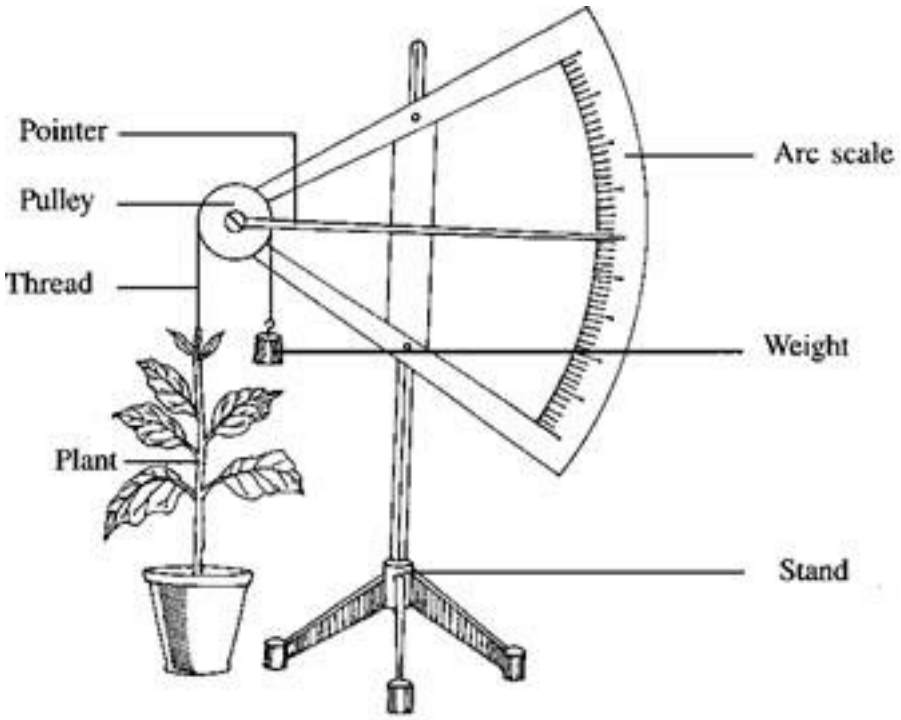


Fig. 2.16 Lever Auxanometer