



Plant Growth and Development Important Questions With Answers

NEET Biology 2023

1. Read the given statements and select the option that correctly identifies the incorrect ones.

- (i) Cytokinin is primarily concerned with cell division.
 - (ii) C_2H_4 breaks seed and bud dormancy
 - (iii) ABA stimulates the opening of stomata.
 - (iv) C_2H_4 initiates germination in peanut seeds, sprouting of potato tubers.
 - (v) ABA is synergistic to GA.
- a) (i), (ii) and (iv) b) (iii) and (ii) **c) (iii) and (v)** d) (iv) and (v)

Solution : -

ABA causes stomatal closure. ABA is antagonistic to GA.

2. Removal of auxin source demonstrates that leaf abscission is by _____ auxin, and apical dominance is by _____ auxin.

- a) promoted, promoted b) inhibited, inhibited c) promoted, inhibited **d) inhibited, promoted**

Solution : -

Shedding of mature leaves from the stem or ripe fruits from the stem is called abscission. Generally a layer of tissue is formed at the base of the organ. This layer of tissue is called abscission zone. Abscission zone does not occur when the concentration of auxin is high, particularly when the gradient of auxin is steep i.e., more auxin on distal side and less auxin on proximal side. The abscission zone formation occurs rapidly when the auxin gradient becomes slight or neutral. Moreover, the plant hormone ethylene is found to promote the abscission. Thus, a high concentration of auxin prevents the formation of abscission layer and the phenomenon is controlled by the concentrations of auxin and ethylene. Apical dominance is promoted by auxin.

3. Spindle fibres attach on to :-

- a) Telomere of the chromosome **b) Kinetochore of the chromosome** c) Centromere of the chromosome
d) Kinetosome of the chromosome

4. Mowing grass lawn facilitates better maintenance because _____

- a) wounding stimulates regeneration b) removal of apical dominance and stimulation of intercalary meristem
c) removal of apical dominance **d) removal of apical dominance and promotion of lateral meristem**

Solution : -

Apical dominance of terminal bud is due to the secretion of auxin (IAA) by it. According to Thimann and Skoog (1933) removal of apical bud causes sprouting of lateral buds with stimulation of intercalary meristem and this is the reason that mowing grass lawn facilitates better maintenance.

5. Monocarpic plants are those which

- a) bear flowers with one ovary **b) flower once and die** c) bear only one flower d) all of the above.

Solution : -

Monocarpic plants are those that flowers once during their life time, set seeds and then die, e.g., bamboos.

6. Match column I with column II and select the correct option from the codes given below

Column I		Column II
A. Auxin	(i)	Fruit ripening
B. Cytokinins	(ii)	Phototropism
C. Abscisic acid	(iii)	Antagonist to GAs
D. Ethylene	(iv)	Growth of lateral buds

- a) A-(iv), B-(ii), C-(iii), D-(i) **b) A-(ii), B-(iv), C-(iii), D-(i)** c) A-(ii), B-(iii), C-(iv)/ D-(i)
 d) A-(iii), B-(iv), C-(ii)/ D-(i)

7. Spraying sugarcane with gibberellins increases the yield by as much as 20 tonnes per acre. GA performs it by
 a) improving the quality of fruit b) increasing sugar content **c) internodal elongation**
 d) delaying senescence.

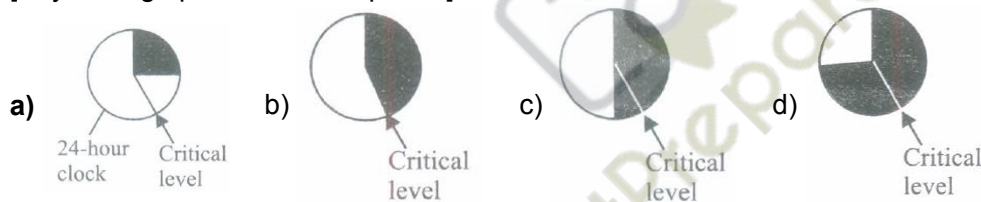
8. Senescence as an active developmental cellular process in the growth and functioning of a flowering plant, is indicated in ____
 a) vessels and tracheid differentiation **b) leaf abscission** c) annual plants d) floral parts

Solution : -

Senescence is the gradual deterioration of functional life of an organisms. It can be limited to particular plant organ like leaf, flower or cells such as phloem and xylem or whole plant. Abscission is natural shedding of leaves, fruits floral parts, foliage branches, etc. Whole plant senescence occurs in annuails like rice, wheat, gram and biennials like henbane or perennials.

9. Maryland mammoth tobacco is a short day plant. Its critical duration of darkness is 10 hours. Under which of the following conditions will it not flower?

[Key: □ Lightperiod ■ Darkperiod]



Solution : -

A short day plant is the one that flowers on photoperiods shorter than the critical day length. As the critical duration of darkness in the Maryland mammoth tobacco is 10 hours, i.e., it requires a minimum period of darkness of 10 hours to flower. Thus under the conditions shown in option (a), the plant will not flower.

10. Functions of auxins include
 a) promoting flowering in pineapple b) inducing parthenocarpy in tomato
 c) use as herbicides to kill dicot weeds **d) all of these**

Solution : -

NAA and 2, 4-D are often employed for inducing flowering in litchi and pineapple. Application of auxins (e.g., IAA, IBA) and conjugate auxins (e.g., IBA-alanine) to unpollinated pistils make them develop into seedless fruits (or parthenocarps) which carry a better market price than the normal fruits having seeds. 2, 4-D and 2, 4, 5-T are used as weedicides (herbicides) which destroy broad leaved weeds in cereal crops and lawns. Dalapon (2, 2-dichloro propionic acid) kills grasses in broad leaved crops.

11. In which of the following forms is iron absorbed by plants?
 a) Free element b) Ferrous **c) Ferric** d) Both ferric and ferrous

Solution : -

Iron is absorbed by the plants in the form of Ferric (Fe^{3+})

12. Auxanometer is meant for measuring -
a) Respiratory activity b) Photosynthetic activity **c) Growth activity** d) Osmotic pressure

13. Ethylene gas is used for _____
a) growth of plants b) delaying fruits abscission **c) ripening of fruits** d) stopping the leaf abscission

Solution : -

Climacteric fruits are fleshy fruits which show a sudden sharp rise of respiration rate at the time of ripening. Ethylene is used to induce artificial ripening of these fruits, e.g. apple, mango, banana

14. Which among the following is not a function of cytokinins?
a) Helps to overcome apical dominance b) Essential for cytokinesis during cell division
c) Delays the senescence of leaves **d) Helps in fruit ripening**

Solution : -

Cytokinins do not take part in fruit ripening. Ethylene hormone stimulates ripening of fruits.

15. Typical growth curve in plants is _____
a) Linear b) Stair-steps shaped c) Parabolic **d) Sigmoid**

Solution : -

Typical growth curve in plant is 'Sigmoid' which has three phases - Lag phase (Initial phase), Log phase (exponential phase) and Steady phase (stationary phase).

16. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Auxins	(i) Breaking seed dormancy
B. Gibberellins	(ii) Inducing fruit ripening
C. Cytokinins	(iii) Formation of abscission layer
D. Ethylene	(iv) Root initiation
	(v) Chloroplast development in leaves

a) A-(iv), B-(i), C-(v), D-(ii) b) A-(iv), B-(v), C-(iii), D-(ii) c) A-(i), B-(iii), C-(ii), D-(iv)
d) A-(iii), B-(iv), C-(i), D-(v)

17. Dormancy of seeds is broken by red light in
a) gram b) pea **c) lettuce** d) castor

Solution : -

Many viable seeds germinate immediately after harvest if provided with suitable conditions of germination i.e., water, oxygen and suitable temperature. Some plants like lettuce need light also.

18. Increase in girth (diameter) of plant as a result of the activities of lateral meristems is called
a) primary growth **b) secondary growth** c) open form of growth d) diffuse growth

19. To get a carpet like grass, lawns are mowed regularly, this is done to
a) remove the shoot apical meristem b) remove the axillary buds c) accelerate the growth of terminal bud
d) both (b) and (c).

20. High concentration of auxin is present in
a) root apex **b) stem apex** c) node d) petiole

Solution : -

The term 'auxin' is applied to the indole-3-acetic acid (IAA), and to other natural and synthetic compounds having certain growth regulating properties. They are generally produced by the growing apices of the stem, from where they migrate to the regions of their action.

21. The activity of α -amylase in the endosperm of a germinating seed of barley is induced by:

- a) ethylene b) cytokinin c) IAA **d) gibberellin**

Solution : -

Gibberellic acid induces de novo (a new) synthesis of various hydrolytic enzymes, such as, α -amylase, ribonuclease, α -1,3-glucanase and protease in aleurone cells of barley grains. This has been experimentally shown by isolating the aleurone layer and treating it with gibberellin solution. These enzymes are mobilised to endosperm during germination and hydrolyse the storage reserve.

22. Gibberellin was first extracted from

- a) Gibberella fujikori** b) Gelidium c) Gracilaria d) Aspergillus

Solution : -

In Japan (in early 1800's), certain rice plants suffered from bakanae (foolish seedling) disease. Such rice plants were thin, pale green, spindle shaped, longer by 50% than the healthy plants, and were sterile. The disease was found by Hori and Kurosawa to be caused by a fungus, Gibberella fujikori. The fungus is the perfect stage of Fusarium moniliforme.

23. Which one of the following acids is a derivative of carotenoids?

- a) Indole-3 -acetic acid b) Gibberellic acid **c) Abscisic acid** d) Indole butyric acid

Solution : -

Abscisic acid is derivative of carotenoids, It is a terpenoid i.e. derivative of steroid. Indole butyric acid and indole-3-acetic are auxins, which are weak organic acids, Gibberellic acid is a terpene.

24. Phototropic and geotropic movements are linked to _____

- a) gibberellins b) enzymes **c) auxins** d) cytokinins

Solution : -

Differential distribution of indole 3 - acetic acid produces tropical plant responses like phototropism and geotropism. Phototropism is directional growth movement of curvature induced by direction of light while geotropism is directional movement of, curvature caused by the unilateral application of force of gravity.

25. Movement of leaves of sensitive plant, Mimosa pudica is due to _____ .

- a) therrmonasty **b) Seismonasty** c) hydrotropism d) chemonasty

Solution : -

In seismonastic movement, response is made to mechanical shocks such as blows, shaking or pressure, In Mimosa, turgor changes occur in thin walled cells of pulvinus (lower side) and pulvinnules (upper side), causing folding of pinnules, drooping of compound leaves.

26. What will be the effect on phytochrome in a plant subjected to continuous red light?

- a) Level of phytochrome decreases **b) Phytochrome is destroyed** c) Phytochrome synthesis increases
d) Destruction and synthesis of phyochrome remain in equilibrium

Solution : -

Continuous exposure to red light causes (a) conversion of P_r - P_{fr} , which is rapidly destroyed, (b) inhibition of synthesis of P_r . Thus, total amount of phyochrome is decreased

27. ABA acts antagonistic to

- a) ethylene b) cytokinin **c) gibberellic acid** d) IAA.

Solution : -

Abscisic acid is an antagonist to gibberellins as shown in the table given below:

Abcisic acid	Gibberellic acid
Inhibits growth	It promotes growth
It promotes the dormancy of seeds, buds and tubers.	It overcomes the natural dormancy of seeds, tubers, etc.
It inhibits the synthesis of RNA and proteins.	It promotes the synthesis of RNA and Proteins.

Causes abscission of flowers and fruits.	Promotes development of fruits.
Promotes leaf senescence	Prevents leaf senescence
Promotes stomatal closure	Promotes stomatal opening
Prevents amylase activity.	Promotes amylase activity during seed germination

28. Persistent nucellus in the seed is known as _____

- a) **Perisperm** b) Hilum c) Tegmen d) Chalaza

Solution : -

Persistent Nucellus is called perisperm e.g, Black pepper Beet.

29. _____ are the examples of tissues, formed by dedifferentiation.

- a) Interfascicular cambium b) Cork cambium **c) Both (a) and (b)** d) Tracheary elements

Solution : -

Both interfascicular cambium and cork cambium are the examples of tissues formed by dedifferentiation.

30. Artificial ripening of fruits is caused by the treatment of

- a) IAA b) NAA **c) ethylene** d) kinetin

31. What causes a green plant to bend towards light as it grows?

- a) Because green plant need light to carry on photosynthesis b) Because green plant are phototropic
c) Light stimulates plant cells on the lighted side to grow faster **d) Auxin accumulates on the shaded side**

32. Which of the following may be the substitute of vernalisation:

- a) IAA **b) GA** c) ABA d) NAA

33. Differentiation of shoot is controlled by _____

- a) high gibberellin : cytokinin ratio b) high auxin : cytokinin ratio **c) high cytokinin : auxin ratio**
d) high gibberellin : auxin ratio

Solution : -

Root's differentiation is controlled by high auxin concentration. While in tissue culture, auxin concentration is made high to Promote rooting

34. Hormone that promotes growth of lateral buds and has negative effect on apical dominance is

- a) cytokinin** b) gibberellin c) auxin d) both (b) and (c).

35. In the following question, a statement of assertion is followed by a statement of reason.

Mark the correct choice as :

Assertion: The difference in shapes of leaves produced in air and those produced in water in buttercup represent the heterophyllous development due to environment.

Reason: The phenomenon of heterophylly is an example of plasticity.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reason are true but reason is not the correct explanation of assertion.

- c) If assertion is true but reason is false. d) If both assertion and reason are false

Solution : -

Different structures are developed during different phases of growth as well as in response to environment. To cope up with the changes in environment, the plant organs also change their structures and it is called plasticity. Heterophylly is the occurrence of different types of leaves on the same plant in different growth phases or under different environmental conditions. In case of environmental plasticity shown by aquatic butter cup *Ranunculus flabellaris*, the submerged leaves are highly dissected while the emerged leaves are broad and lobed.

36. What causes a green plant exposed to the light on only one side, to bend toward the source of light as it grows?

- a) Green plants seek light because they are phototropic
- b) Light stimulates plant cells on the lighted side to grow faster.
- c) Auxin accumulates on the shaded side, stimulating greater cell elongation there**
- d) Green plants need light to perform photosynthesis

Solution : -

When a green plant exposed to light on one side, it bends towards light because Auxin accumulates on the shaded side, stimulating greater cell elongation there. Auxin is a shade lover hormone. It moves away from light.

37. Primary precursor of I.A.A is :

- a) Phenyl alanine b) Tyrosine **c) Tryptophan** d) Leucin

38. Kinetin, a modified form of adenine was discovered from

- a) autoclaved herring sperm DNA** b) coconut milk c) corn kernel d) fungus

39. Hormone antagonist to gibberellins is

- a) IAA** b) ABA c) Zeatin d) Ethylene

Solution : -

Fact.

40. Low temperature treatment to speed up the process of flowering is referred to as

- a) photoperiodism **b) vernalisation** c) thermoperiodism d) hydroponics

Solution : -

Vernalisation is the process of shortening of the juvenile or vegetative phase and hastening flowering by a previous cold treatment. In vernalisation by cold treatment winter varieties are transferred into spring or summer varieties. Site of vernalisation is apical meristem or all the meristematic cells e.g., shoot tip, embryo tips, root apex etc. Low temperature required for vernalisation is usually 0°-5°C. As a result of vernalisation, a flowering hormone called vernalin is formed (reported by Melchers), but vernalin has never been isolated.

41. A pigment concerned with both floral induced and seed germination is:

- a) Florigen b) Chlorophyll c) Plastocyanin **d) Phytochrome**

42. Hormone responsible for ageing is

- a) GA b) IAA **c) ABA** d) cytokinin

Solution : -

ABA is a plant growth inhibitor. It promotes senescence and ageing in plant parts.

43. Pollen grains can be stored for several years in liquid nitrogen having temperature of _____

- a) -196°C** b) -80°C c) -120°C d) -160°C

Solution : -

Pollen grains can be stored for several years in liquid nitrogen at -196°C. It is called cryopreservation

44. Cut or excised leaves remain green for long if induced to root or dipped in _____

- a) gibberellins **b) cytokinins** c) auxins d) ethylene

Solution : -

In Richmond-Lang effect, cytokinin delays senescence of leaves. As cytokinin treated detached leaves remain green after a period of twenty days whereas controlled leaves were completely yellow and drying at tips and margins. It was concluded that cytokinin was able to postpone for a number of days the disappearance of chlorophyll and degradation of proteins that normally occur with the ageing process of leaves.

45. Abscisic acid controls _____

- a) cell division **b) leaf fall and dormancy** c) shoot elongation d) cell elongation and wall formation

Solution : -


Abscisic Acid (ABA) is called stress hormone or dormin. It is a growth retarding hormone which induces dormancy, promotes ageing and abscission of fruits, leaves and flowers. It also causes closure of stomata and overcome the conditions of stress.

46. The stimulus of cold treatment (vernalisation) is perceived by
a) leaves b) flowers c) roots **d) shoot apices**
47. The gaseous hormone concerned with fruit ripening is
a) CK **b) Ethylene** c) Abscisic acid d) NAA
48. Which of the following effects of auxins on plants is the basis for their commercial application?
a) Callus formation b) Curvature of stem **c) Induction of root formation in stem cuttings**
d) Induction of shoot formation
49. Movement of auxin is _____ .
a) centripetal b) basipetal c) acropetal **d) Both (b) and (c)**

Solution : -

Went (1928) reported that auxin is transported basipetally, i.e., it moves from apical to basal end. However, McCready and Jacobs (1963) working on petiole segments of *Phaseolus vulgaris* observed acropetal movement of auxin but such type of movement occurs very little and directly dependent with the presence of oxygen. Thus, recent studies have indicated that the polar movement of auxin is an active transport.

50. Root development is promoted by:
a) Auxin b) Gibberellin c) Ethylene **d) Abscisic acid**


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