BIOLOGY

NEET

CRASH COURSE

PLANT GROWTH AND DEVELOPMENT

SMART ACHIEVERS

JEE | NEET | FOUNDATION

587, Nitikhand-1, Indirapuram, Gzb.

7292077839 / 7292047839 | smartachievers.online

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PLANT GROWTH AND DEVELOPMENT

1. Growth is one of the most conspicuous events in any living organism.
2. It is an irreversible increase expressed in parameters such as size, area, length, height, volume; cel1 number etc.
3. It conspicuously involves increased protoplasmic material.
4. In plants, meristems are the sites of grqwth.
5. Root and shoot apical meristems sometimes along with intercalary meristem, contribute to the elongation growth of plant axes.
6. Growth is indeterminate in higher plants.
7. Following cell division in root and shoot apical meristem cells, the growth could be arithmetic or geometrical.
8. Growth may not be and generally is not substained ata high rate throughout the life of cell/tissue/organ/ organism.
9. One can define three principle phases of growth the lag, the log and the senescent phase.
10. When a cell loses the capacity to divide, it leads to differentiation.
11. Differentiation results in development of structures that is commensurate with the function the cells finally has to perform.
12. General principles for differentiation for cell, tissues and organs are similar.
13. A differentiated cell may dedifferentiate and then redifferentiate.
14. Since differentiation in plants is open, the development could also be flexible, i.e., the development is the sum of growth and differentiation.
15. Plant exhibit plasticity in development.
16. Plant growth and development are under the control of both intrinsic and extrinsic factors.
17. Inter cellular intrinsic factors are the chemical substances, called plant growth regulators (PGR).
18. There are diverse groups of PGRs in plants, principally belonging to five groups: auxins, gibberelins, cytokinins, abscisic acid and ethylen.
19. These PGRs are synthesised in various parts of the plant, they control different differentiation and developmental events.
20. Any PGR has diverse physiologioal effects on plants. Diverse PGRs also manifest similar effects. PGRs may act synergistically or antagonistically.
21. Plant growth and development is also affected by light, temperature, nutrition, oxygen status, gravity and such external factors.
22. Flowering in some plants is induced only when exposed to certain duration of photoperiod.
23. Depending on the nature of photoperiod requirements, the plants are called short day plants, long day plants and day-neutral plants.
24. Certain plants also need to be exposed to low temperature so as to hasten flowering later in life. This treatment is known as vernalisation.

EXERCISE

Q.1 Avena coleoptile test to find out the quantity of growth promoting hormones was discovered by
(1) F.W. Went (2) L.J. Oudus (3) K.V. Thimann (4) F. Skoog

Q.2 Primary precursor of I.A.A is :-
(1) Phenyl alanine (2) Tyrosine (3) Tryptophan (4) Leucin

Q.3 Which of the following is not natural occuring plant hormone ?
(1) 2 , 4 - D (2) GA2 (3) Gibberellin (4) I.A.A

Q.4 Auxin is mainly produced by -
(1) Apical root meristem (2) Root cambium
(3) Apical shoot meristem (4) Phloem in shoot tip

Q.5 Which one of the following is motivative force for growth ?
(1) Turgor pressure (2) Root pressure
(3) Atmospheric pressure (4) Osmotic pressure

Q.6 Which one of the following nutrients is concerned with the growth of the plants in view of their role in synthesis of auxin -
(1) S (2) Mn (3) Zn (4) K

Q.7 Which growth hormone is responsible for apical dominance ?
(1) Auxin (2) Cytokinin (3) Gibberellin (4) Ethylene

Q.8 2 , 4 - D is a synthetic -
(1) Auxin (2) Gibberellin (3) Cytokinin (4) Florigen

Q.9 Which weedicide can defoliate the complete forest ?
(1) 2, 4–D (2) MH (3) AMO - 1618 (4) ABA

Q.10 Agent orange is-
(1) Biodegradable insecticide (2) Dioxin weedicide
(3) Biofertilizer (4) Biopesticide

Q.11 Growth curve is -
(1) S-shaped (2) Sigmoid (3) L-shaped (4) Both 1 & 2

Q.12 Internodal elongation is stimulated by :-
(1) Auxin (2) Cytokinin (3) Gibberellin (4) Phenol

Q.13 Gibberellin was first extracted from -
(1) *Fusarium moniliforme = Gibberella fujikuroi*
(2) *Gellidium*
(3) *Gracillaria*
(4) *Aspergillus*

Q.14 Bolting hormone is -
(1) Auxin (2) Gibberellin (3) ABA (4) Ethylene

Q.15 Which of the following breaks the dormancy of seeds ?
(1) IAA (2) GA_3 (3) Ethylene (4) All the above

Q.16 Which of the following is a coconut milk factor ?
(1) Auxin (2) ABA (3) Morphactin (4) Cytokinin

Q.17 Which of the following hormones is known to promote maleness in flowering plants ?
(1) Gibberellic acid (2) Kinetin (3) IAA (4) 2, 4–D

Q.18 The activity of α–amylase in the endospore of barley germinating seed is induced by :-
(1) Ethylene (2) Cytokinin (3) IAA (4) Gibberellin

Q.19 Dormancy of seed is broken by :-
(1) Auxin (2) Gibberellins (3) Ethylene (4) Cytokinin

Q.20 In tissue culture, differentiation of shoot is controlled by :-
(1) Light Intensity (2) Temperature shock
(3) Low Auxin + High CK $\left(\text{High } \frac{\text{Cyto}}{\text{Auxin}} \text{Ratio}\right)$ (4) None

Q.21 Among the following which helps in early ripening of fruits ?
(1) Methane (2) Ethylene (3) CO_2 (4) CO

Q.22 The hormone produced during adverse environmental condition is :-
(1) Abscisic acid (2) N^6–Isopentanyl adenine (CK)
(3) Dichlorophenoxy acetic acid (2,4–D) (4) Gibberellic acid (GA)

Q.23 Seed dormancy is due to the :-
(1) Ethylene (2) Abscisic acid (3) IAA (4) Starch

Q.24 Effect of day length on plant development is called
(1) Phototropism (2) Photoperiodism (3) Chemotropism (4) Photosynthesis

Q.25 Which plant is LDP ?
(1) *Tobacco* (2) *Glycine max.* (3) *Mirabilis* (4) *Spinach*

Q.26 Movement of pollen tube is :–
(1) Chemotropism (2) Hydrotropism (3) Phototropism (4) None

AIIMS Special

Instructions for following questions (Q.27 to Q.46).

(1) If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).
(2) If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2).
(3) If Assertion is true statement but Reason is false, then mark (3).
(4) If both Assertion and Reason are false statements, then mark (4).

Q.27 **Assertion :** If a plant is kept horizontally, auxin accumulates on lower surface.
Reason : Displacement of statoliths and other cell organelles to lower surface modifies the translocation pattern of auxin.

Q.28 **Assertion :** Only bud, or embryo can be vernalized.
Reason : Vernalization requires dividing cells.

Q.29 **Assertion :** Phytochrome, a protein, has regulatory function.
Reason : Various morphogenetic processes are regulated by it.

Q.30 **Assertion :** Auxins treatment cause acidification of cell wall and help in cell elongation.
Reason : Loosening of cell wall microfibrils occurs.

Q.31 **Assertion :** Cytokinins are anti ageing hormones.
Reason : They cause changes in osmotic potential by increasing the volume of mature cells.

Q.32 **Assertion :** Plants usually bend towards the source of light.
Reason : Shoot apex shows positive phototropism due to unequal distribution ofr auxin.

Q.33 **Assertion :** Xanthium will not flower if the long dark period is interrupted by red light.
Reason : Xanthium is a long night plant.

Q.34 **Assertion :** ABA play an important role in plants during water stress.
Reason : ABA promotes stomatal closing during water stress.

Q.35 **Assertion :** Leaves of Mimosa plants droopes after touching.
Reason : Phytochrome is necessary for flowering in Mimosa plant.

Q.36 **Assertion :** a-amylase activity test, used for bioassay of Gibberellins.
Reason : Gibberellins inhibit the activity of a-amylase in barley endosperm.

Q.37 **Assertion :** Senescence is induced by the application of cytokinins in plants.
Reason : Cytokinin promotes the degradation of chlorophylls & nucleic acids.

Q.38 **Assertion :** Avena colepotile curves towards light.
Reason : Hormone Gibberellin produced in Avena coleoptile for light stimulus.

Q.39 **Assertion :** Gibberellin hormone is antitranspirant.
Reason : Gibberellin closes the stomata.

Q.40 **Assertion :** Brief exposure of red light in dark phase of Maryland & Biloxy soyabean plants inhibits flowering.
Reason : These are SNP.

Q.41 **Assertion :** Bolting effect in plants is performed by G.A.
Reason : G.A. induces internode elongation.

Q.42 **Assertion :** LDP does not flower if dark period is interrupted by red light.
Reason : They can synthesize Pr in red-light.

Q.43 **Assertion :** Flowering in tobacco is inhibited if dark phase is interrupted by red light.
Reason : Tobacco is a short day plant.

Q.44 **Assertion :** Rosette habit of cabbage can be eliminate by gibberellins.
Reason : Gibberellin induces a-amylase.

Q.45 **Assertion :** Napthalene acetic acid used for elimination of genetic dwarfism in plants.
Reason : This chemical increase the size of internode.

Q.46 **Assertion :** Coconut milk factor can be used in tissue culture.
Reason : Coconut milk factor performs activity like cytokinin.

ANSWER KEY

Q.1	1	Q.2	3	Q.3	1	Q.4	3	Q.5	1	Q.6	3	Q.7	1
Q.8	1	Q.9	3	Q.10	2	Q.11	4	Q.12	3	Q.13	1	Q.14	2
Q.15	2	Q.16	4	Q.17	1	Q.18	4	Q.19	2	Q.20	3	Q.21	2
Q.22	1	Q.23	2	Q.24	2	Q.25	4	Q.26	1	Q.27	1	Q.28	1
Q.29	1	Q.30	1	Q.31	2	Q.32	1	Q.33	1	Q.34	1	Q.35	2
Q.36	3	Q.37	4	Q.38	3	Q.39	4	Q.40	3	Q.41	1	Q.42	4
Q.43	1	Q.44	2	Q.45	4	Q.46	1						