CHAPTER 15

Plant Growth and Development

15.1 Growth

1. The process of growth is maximum during
(a) log phase (b) lag phase
(c) senescence (d) dormancy.
(NEET 2020)

2. Typical growth curve in plants is
(a) stair-steps shaped
(b) parabolic
(c) sigmoid
(d) linear. *(2015 Cancelled)*

15.3 Development

3. Senescence as an active developmental cellular process in the growth and functioning of a flowering plant, is indicated in
(a) annual plants
(b) floral parts
(c) vessels and tracheid differentiation
(d) leaf abscission. *(2008)*

15.4 Plant Growth Regulators

4. Name the plant growth regulator which upon spraying on sugarcane crop, increases the length of stem, thus increasing the yield of sugarcane crop.
(a) Cytokinin (b) Gibberellin
(c) Ethylene (d) Abscisic acid
(NEET 2020)

5. Which of the following is not an inhibitory substance governing seed dormancy?
(a) Gibberellic acid (b) Abscisic acid
(c) Phenolic acid (d) Para-ascorbic acid
(NEET 2020)

6. It takes very long time for pineapple plants to produce flowers. Which combination of hormones can be applied to artificially induce flowering in pineapple plants throughout the year to increase yield?
(a) Cytokinin and Abscisic acid
(b) Auxin and Ethylene
(c) Gibberellin and Cytokinin
(d) Gibberellin and Abscisic acid *(NEET 2019)*

7. Fruit and leaf drop at early stages can be prevented by the application of
(a) ethylene (b) auxins
(c) gibberellic acid (d) cytokinins.
(NEET 2017)

8. You are given a tissue with its potential for differentiation in an artificial culture. Which of the following pairs of hormones would you add to the medium to secure shoots as well as roots?
(a) IAA and gibberellin
(b) Auxin and cytokinin
(c) Auxin and abscisic acid
(d) Gibberellin and abscisic acid *(NEET-II 2016)*

9. The *Avena* curvature is used for bioassay of
(a) IAA (b) ethylene
(c) ABA (d) GA_3. *(NEET-I 2016)*

10. Auxin can be bioassayed by
(a) potometer
(b) lettuce hypocotyl elongation
(c) *Avena* coleoptile curvature
(d) hydroponics. *(2015)*

11. What causes a green plant exposed to the light, on only one side, to bend towards the source of light as it grows?
(a) Light stimulates plant cells on the lighted side to grow faster.
(b) Auxin accumulates on the shaded side, stimulating greater cell elongation there.
(c) Green plants need light to perform photosynthesis.
(d) Green plants seek light because they are phototropic. *(2015 Cancelled)*

12. Dr. F. Went noted that if coleoptile tips were removed and placed on agar for one hour, the agar would produce a bending when placed on one side of freshly-cut coleoptile stumps. Of what significance is this experiment?

(a) It made possible the isolation and exact identification of auxin.
(b) It is the basis for quantitative determination of small amounts of growth-promoting substances.
(c) It supports the hypothesis that IAA is auxin.
(d) It demonstrated polar movement of auxins. *(2014)*

13. Which one of the following growth regulators is known as 'stress hormone'?
(a) Abscisic acid (b) Ethylene
(c) GA_3 (d) Indole acetic acid
(2014)

14. During seed germination, its stored food is mobilized by
(a) ABA (b) gibberellin
(c) ethylene (d) cytokinin.
(NEET 2013)

15. The pineapple which under natural condition is difficult to blossom has been made to produce fruits throughout the year by application of
(a) NAA, 2, 4-D (b) Phenyl acetic acid
(c) Cytokinin (d) IAA, IBA.
(Karnataka NEET 2013)

16. Through their effects on plant growth regulators, what do the temperature and light control in the plants?
(a) Apical dominance
(b) Flowering
(c) Closure of stomata
(d) Fruit elongation *(Mains 2012)*

17. Which one of the following generally acts as an antagonist to gibberellins?
(a) Zeatin (b) Ethylene
(c) ABA (d) IAA *(Mains 2012)*

18. Phototropic curvature is the result of uneven distribution of
(a) gibberellin (b) phytochrome
(c) cytokinins (d) auxin. *(2010)*

19. One of the commonly used plant growth hormone in tea plantations is
(a) ethylene (b) abscisic acid
(c) zeatin (d) indole-3-acetic acid.
(Mains 2010)

20. Root development is promoted by
(a) abscisic acid (b) auxin
(c) gibberellin (d) ethylene.
(Mains 2010)

21. One of the synthetic auxin is
(a) IAA (b) GA
(c) IBA (d) NAA. *(2009)*

22. 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 *(2009)*

23. Which one of the following pairs, is not correctly matched?
(a) Gibberellic acid - Leaf fall
(b) Cytokinin - Cell division
(c) IAA - Cell wall elongation
(d) Abscissic acid - Stomatal closure *(2007)*

24. Parthenocarpic tomato fruits can be produced by
(a) treating the plants with phenylmercuric acetate
(b) removing androecium of flowers before pollen grains are released
(c) treating the plants with low concentrations of gibberellic acid and auxins
(d) raising the plants from vernalized seeds. *(2006)*

25. How does pruning help in making the hedge dense?
(a) It releases wound hormones.
(b) It induces the differentiation of new shoots from the rootstock.
(c) It frees axillary buds from apical dominance.
(d) The apical shoot grows faster after pruning.
(2006)

26. Cell elongation in internodal regions of the green plants takes place due to
(a) indole acetic acid (b) cytokinins
(c) gibberellins (d) ethylene. *(2004)*

27. Coconut milk factor is
(a) an auxin (b) a gibberellin
(c) abscisic acid (d) cytokinin. *(2003)*

28. Plants deficient of element zinc, show its effect on the biosynthesis of plant growth hormone
(a) auxin (b) cytokinin
(c) ethylene (d) abscisic acid. *(2003)*

29. Differentiation of shoot is controlled by
(a) high auxin : cytokinin ratio
(b) high cytokinin : auxin ratio
(c) high gibberellin : auxin ration
(d) high gibberellin : cytokinin ratio. *(2003)*

30. Dwarfness can be controlled by treating the plant with
(a) cytokinin (b) gibberellic acid
(c) auxin (d) anti-gibberellin.
(2002, 1992)

31. Which of the following prevents the fall of fruits?
(a) GA_3 (b) NAA
(c) Ethylene (d) Zeatin *(2001)*

32. Hormone responsible for senescence is
(a) ABA (b) auxin
(c) GA (d) cytokinin. *(2001)*

33. Which hormone breaks dormancy of potato tuber?
(a) Gibberellin (b) IAA
(c) ABA (d) Zeatin *(2001)*

34. If the apical bud has been removed then we observe
(a) more lateral branches
(b) more axillary buds
(c) plant growth stops
(d) flowering stops. *(2000)*

35. Which hormone is responsible for fruit ripening?
(a) Ethylene (b) Auxin
(c) Ethyl chloride (d) Cytokinin *(2000)*

36. ABA is involved in
(a) shoot elongation
(b) increased cell division
(c) dormancy of seeds
(d) root elongation. *(1999)*

37. A plant hormone used for inducing morphogenesis in plant tissue culture is
(a) cytokinins (b) ethylene
(c) abscisic acid (d) gibberellins. *(1998)*

38. Which combination of gases is suitable for fruit ripening?
(a) 80% CH_4 and 20% CO_2
(b) 80% CO_2 and 20% O_2
(c) 80% C_2H_4 and 20% CO_2
(d) 80% CO_2 and 20% CH_2 *(1998)*

39. Which one among the following chemicals is used for causing defoliation of forest trees?
(a) Malic hydrazide (b) 2, 4-D
(c) Amo-1618 (d) Phosphon D *(1998)*

40. Gibberellic acid induces flowering
(a) in short day plants under long day conditions
(b) in day-neutral plants under dark conditions
(c) in some gymnospermic plants only
(d) in long day plants under short day conditions. *(1997)*

41. The movement of auxin is largely
(a) centripetal (b) basipetal
(c) acropetal (d) both (a) and (c). *(1994)*

42. If the growing plant is decapitated, then
(a) its growth stops
(b) leaves become yellow and fall down
(c) axillary buds are inactivated
(d) axillary buds are activated. *(1994)*

43. Removal of apical bud results in
(a) formation of new apical bud
(b) elongation of main stem
(c) death of plant
(d) formation of lateral branching. *(1993)*

44. The regulator which retards ageing/senescence of plant parts is
(a) cytokinin (b) auxin
(c) gibberellin (d) abscisic acid. *(1993)*

45. The hormone produced during adverse environmental conditions is
(a) benzyl aminopurine
(b) bichlorophenoxy acetic acid
(c) ethylene
(d) abscisic acid. *(1993)*

46. Klinostat is employed in the study of
(a) osmosis
(b) growth movements
(c) photosynthesis
(d) respiration. *(1993)*

47. Which is produced during water stress that brings stomatal closure?
(a) Ethylene
(b) Abscisic acid
(c) Ferulic acid
(d) Coumarin *(1993)*

48. Bananas can be prevented from over-ripening by
(a) maintaining them at room temperature
(b) refrigeration
(c) dipping in ascorbic acid solution
(d) storing in a freezer. *(1992)*

49. Apical dominance is caused by
(a) abscisic acid in lateral bud
(b) cytokinin in leaf tip
(c) gibberellin in lateral buds
(d) auxin in shoot tip. *(1992)*

50. Cytokinins
(a) promote abscission
(b) influence water movement
(c) help retain chlorophyll
(d) inhibit protoplasmic streaming. *(1992)*

51. Which is employed for artificial ripening of banana fruits?
(a) Auxin (b) Coumarin
(c) Ethylene (d) Cytokinin *(1992)*

52. Abscisic acid causes
(a) stomatal closure (b) stem elongation
(c) leaf expansion (d) root elongation. *(1991)*

53. The hormone responsible for apical dominance is
(a) IAA (b) GA
(c) ABA (d) Florigen. *(1991)*

54. Hormone primarily connected with cell division is
(a) IAA (b) NAA
(c) cytokinin/zeatin (d) gibberellic acid.
(1991, 1988)

55. Highest auxin concentration occurs
(a) in growing tips
(b) in leaves
(c) at base of plant organs
(d) in xylem and phloem. *(1990)*

56. Phytohormones are
(a) chemical regulating flowering
(b) chemical regulating secondary growth
(c) hormones regulating growth from seed to adulthood
(d) regulators synthesised by plants and influencing physiological processes. *(1990)*

57. Abscisic acid controls
(a) cell division
(b) leaf fall and dormancy
(c) shoot elongation
(d) cell elongation and wall formation. *(1990)*

58. Phototropic and geotropic movements are linked to
(a) gibberellins (b) enzymes
(c) auxin (d) cytokinins. *(1990)*

59. Which of the following movement is not related to auxin level?
(a) Bending of shoot towards light
(b) Movement of root towards soil
(c) Nyctinastic leaf movements
(d) Movement of sunflower head tracking the sun
(1990)

60. Leaf fall can be prevented with the help of
(a) abscisic acid (b) auxins
(c) florigen (d) cytokinins. *(1989)*

61. 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. *(1989)*

62. Cut or excised leaves remain green for long if induced to root or dipped in
(a) gibberellins (b) cytokinins
(c) auxins (d) ethylene. *(1988)*

63. Gibberellins promote
(a) seed germination (b) seed dormancy
(c) leaf fall (d) root elongation.
(1988)

15.5 Photoperiodism

64. What is the site of perception of photoperiod necessary for induction of flowering in plants?
(a) Leaves (b) Lateral buds
(c) Pulvinus (d) Shoot apex
(NEET 2019)

65. Phytochrome is a
(a) flavoprotein (b) glycoprotein
(c) lipoprotein (d) chromoprotein.
(NEET-II 2016)

66. Study the four statements (A-D) given below and select the two correct ones out of them.
A. Definition of biological species was given by Ernst Mayr.
B. Photoperiod does not affect reproduction in plants.
C. Binomial nomenclature system was given by R.H. Whittaker.
D. In unicellular organisms, reproduction is synonymous with growth.
The two correct statements are
(a) B and C (b) C and D
(c) A and D (d) A and B.
(NEET-II 2016)

67. Photoperiodism was first characterised in
(a) tobacco (b) potato
(c) tomato (d) cotton. *(2010)*

68. Importance of day length in flowering of plants was first shown in
(a) cotton (b) *Petunia*
(c) *Lemna* (d) tobacco. *(2008)*

69. The wavelength of light absorbed by P_r form of phytochrome is
(a) 680 nm (b) 720 nm
(c) 620 nm (d) 640 nm. *(2007)*

70. One set of the plant was grown at 12 hours day and 12 hours night period cycles and it flowered while in the other set night phase was interrupted by flash of light and it did not produce flower. Under which one of the following categories will you place this plant?
(a) Long day (b) Darkness neutral
(c) Day neutral (d) Short day *(2004)*

71. Which pigment absorbs the red and far-red light?
(a) Cytochrome (b) Phytochrome
(c) Carotenoids (d) Chlorophyll *(2002)*

72. Which plant is LDP?
(a) Tobacco (b) *Glycine max*
(c) *Mirabilis jalapa* (d) Spinach *(2001)*

73. Proteinaceous pigment which controls the activities concerned with light is
(a) phytochrome (b) chlorophyll
(c) anthocyanin (d) carotenoids. *(2001)*

74. The response of different organisms to the environmental rhythms of light and darkness is called
(a) vernalization (b) photoperiodism
(c) phototaxis (d) phototropism. *(1998)*

75. Phytochrome becomes active in
(a) red light (b) green light
(c) blue light (d) none of these. *(1998)*

76. A pigment which absorbs red and far-red light is
(a) cytochrome (b) xanthophyll
(c) phytochrome (d) carotene. *(1997)*

77. What will be the effect on phytochrome in a plant subjected to continuous red light?
(a) Phytochrome synthesis will increase
(b) Level of phytochrome will decrease
(c) Phytochrome will be destroyed
(d) First (b) then (a) *(1997)*

78. If a tree flowers thrice in a year (Oct, Jan and July) in Northern India, it is said to be
(a) photo and thermo-insensitive
(b) photo and thermo-sensitive
(c) photosensitive but thermo-insensitive
(d) thermosensitive but photo-insensitive. *(1997)*

79. In short day plants, flowering is induced by
(a) photoperiod less than 12 hours
(b) photoperiod below a critical length and uninterrupted long night
(c) long night
(d) short photoperiod and interrupted long night. *(1992)*

80. A chemical believed to be involved in flowering is
(a) gibberellin (b) kinetin
(c) florigen (d) IBA. *(1991)*

81. Which one increases in the absence of light?
(a) Uptake of minerals
(b) Uptake of water
(c) Elongation of internodes
(d) Ascent of sap *(1989)*

82. Phytochrome is involved in
(a) phototropism (b) photorespiration
(c) photoperiodism (d) geotropism. *(1988)*

15.6 Vernalisation

83. Vernalisation stimulates flowering in
(a) zamikand (b) turmeric
(c) carrot (d) ginger. *(Mains 2012)*

84. Treatment of seeds at low temperature under moist conditions to break its dormancy is called
(a) stratification (b) scarification
(c) vernalization (d) chelation. *(2006)*

85. Flowering dependent on cold treatment is
(a) cryotherapy (b) cryogenics
(c) cryoscopy (d) vernalisation. *(1992)*

86. Which of the following hormones can replace vernalisation?
(a) Auxin (b) Cytokinin
(c) Gibberellins (d) Ethylene *(1989)*

15.7 Seed Dormancy

87. An enzyme that can stimulate germination of barley seeds is
(a) invertase (b) α-amylase
(c) lipase (d) protease. *(2006)*

88. Seed dormancy is due to the
(a) ethylene (b) abscisic acid
(c) IAA (d) starch. *(2002)*

89. By which action a seed coat becomes permeable to water?
(a) Scarification (b) Stratification
(c) Vernalization (d) All of these *(2000)*

ANSWER KEY

1.	(a)	**2.**	(c)	**3.**	(c)	**4.**	(b)	**5.**	(a)	**6.**	(b)	**7.**	(b)	**8.**	(b)	**9.**	(a)	**10.**	(c)
11.	(b)	**12.**	(a)	**13.**	(a)	**14.**	(b)	**15.**	(a)	**16.**	(b)	**17.**	(c)	**18.**	(d)	**19.**	(d)	**20.**	(d)
21.	(c,d)	**22.**	(c)	**23.**	(a)	**24.**	(c)	**25.**	(c)	**26.**	(c)	**27.**	(d)	**28.**	(a)	**29.**	(b)	**30.**	(b)
31.	(b)	**32.**	(a)	**33.**	(a)	**34.**	(a)	**35.**	(a)	**36.**	(c)	**37.**	(a)	**38.**	(c)	**39.**	(b)	**40.**	(d)
41.	(b)	**42.**	(d)	**43.**	(d)	**44.**	(a)	**45.**	(d)	**46.**	(b)	**47.**	(b)	**48.**	(c)	**49.**	(d)	**50.**	(c)
51.	(c)	**52.**	(a)	**53.**	(a)	**54.**	(c)	**55.**	(a)	**56.**	(d)	**57.**	(b)	**58.**	(c)	**59.**	(c)	**60.**	(d)
61.	(b)	**62.**	(b)	**63.**	(a)	**64.**	(a)	**65.**	(d)	**66.**	(c)	**67.**	(a)	**68.**	(d)	**69.**	(a)	**70.**	(d)
71.	(b)	**72.**	(d)	**73.**	(a)	**74.**	(b)	**75.**	(a)	**76.**	(c)	**77.**	(d)	**78.**	(a)	**79.**	(b)	**80.**	(c)
81.	(c)	**82.**	(c)	**83.**	(c)	**84.**	(c)	**85.**	(d)	**86.**	(c)	**87.**	(b)	**88.**	(b)	**89.**	(a)		