For BioResire students

NEET Biology Material

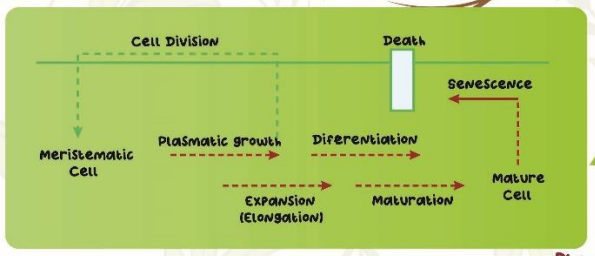
Elite Batch

Website: www.bioresire.in
Contact: +91-6301352398
info@bioresire.in

PLANT GROWTH AND DEVELOPMENT

GROWTH + DIFFERENTIATION = DEVELOPMENT

Development Process of Plant Cell



Plant Growth

- Growth is fundamental feature of living being
- Irreversible permanent increase in size of organ
- Plant growth is indeterminate
- Growth is measurable

Phases of Growth

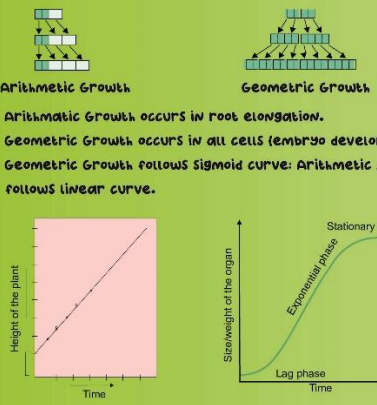
- Meristematic → constantly dividing cells at root & shoot apex
- Elongation → Cell enlargement, cell wall deposition:
- Maturation → Away from apex: cells attain their maximum size & maximum thickening.
- Cells of meristematic zone are rich in protoplasm with large nuclei

Growth Rate

- Growth rate is increase in growth per unit time.

Patterns of Growth Rate

- Arithmetic Growth → One cell divides only: other matures.
- Geometric Growth → Both the cells divide



- Arithmatic Growth occurs in root elongation.
- Geometric Growth occurs in all cells (embryo development)
- Geometric Growth follows Sigmoid curve: Arithmetic growth follows linear curve.

Plant Growth Regulators

- Plant growth regulators are plant hormones (Phytohormones).
- There are chemical compounds.
- Can be growth promoters or growth inhibitors.
- Auxin, gibberellins, cytokinin's are growth promoters
- Abscisic acid is growth inhibitor
- Ethylene is growth inhibitor but also a promoter.

Auxin

- Auxin first isolated from human urine.
- Bioassay of auxin → Avera – curvature
- IAA (Indole – 3- acetic acid)
- Initiate rooting: prevent fruit & leaf drop at early stage
- Induces parthenocarpy in tomatoes
- Produced at root & shoot apices.

Discovery

- Auxin observed by Darwin in coleoptiles of canary grass.
- Auxin isolated by went from tips of coleoptiles of oat.
- Kurosawa identified gibberellic acid in gibberellin fuji kuroi. He observed foolish seedling disease (bakanae) in rice
- Skoog did experiments on callus of tobacco stems to discovers cytokinin
- H.H cousins discovered Ethylene.

Gibberellins

- GA_3 first gibberellins to be discovered
- Gibberellins are acidic
- Increase the stem length (Sugarcane)
- Improves fruit shape (apple)
- Delays senescence
- Promotes bolting in plants with rosette habit (cabbage)
- Used in malting process

Abscisic Acid

- Shortly called as ABA
- Regulates abscission & dormancy
- Plants growth & metabolism inhibitor
- Important for seed development, maturation & dormancy called as stress hormone
- Act against gibberellins
- Stimulates closure of stomata in stress conditions.

Cytokinins

- Discovered as kinetin
- Effects cytokinesis
- Does not found naturally in plants.
- Naturally found as Zeatin in coconut milk
- Synthesized at regions of rapid cell division

Ethylene

- Gaseous hormone
- Synthesized by ripening fruits &amp: tissue undergoing senescence
- Promotes abscission of leaves and flowers
- Breaks seed dormancy: sprouting in potato
- Promotes root hair formation

Photo Periodism

- Response of plants to periods of day (light) & night (dark)
- Induce flowering
- Long day plant → Need light more than critical Pd. for flowering (Radish)
- Short day plants → Need light less than critical Pd.
- Critical Period → length of light for flowering.

Vernalisation

- Induction of flowering in plants by low temperature
- Wheat, barley

Differentiation, Dedifferentiation, Redifferentiation

- Differentiation → cells differentiate become mature to do, specific function: loose capacity to divide.
- Dedifferentiation → cells regain capacity to divide
- Redifferentiation → Dedifferentiated cells again loose capacity to divide & matures.

Seed Dormancy

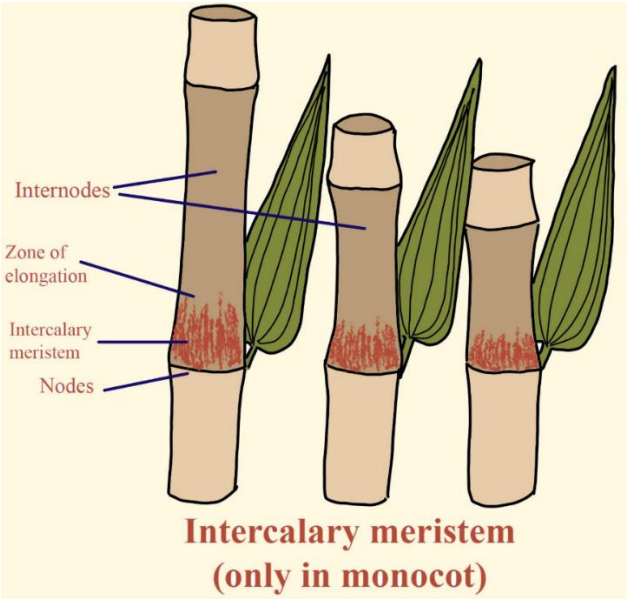
- Seed is unable to germinate even in ideal conditions.
- Due to hard seed coat.
- Seed dormancy overcome by mechanical abrasion, Chilling, orbygibberellins.

PLANT GROWTH AND DEVELOPMENT

Plant Growth and Development

Root, stem, leaves, flowers, fruits and seeds arise in orderly manner in plants. The sequence of growth is as follows:

- **Life cycle of plant:** Plants complete their vegetative phase to move into reproductive phase in which flower and fruits are formed for continuation of life cycle of plant.
- **Growth and differentiation:** Development is the sum of two processes growth and differentiation. Intrinsic and extrinsic factors control the process of growth and development in plants.
- **Growth:** Growth is a permanent or irreversible increase in dry weight, size, mass or volume of cell, organ or organism. It is internal or intrinsic in living beings.
- **Growth is a quantitative phenomenon:** In plants growth is accomplished by cell division, increase in cell number and cell enlargement. So, growth is a quantitative phenomenon which can be measured in relation to time.
- **Plant growth is generally indeterminate:** Plant growth is generally indeterminate due to capacity of unlimited growth throughout the life. Meristem tissues are present at the certain locality of plant body.
- **Open form of growth:** The plant growth in which new cells are always being added to plant body due to meristem is called open form of growth.
- **Root apical meristem and shoot apical meristem:** Root apical meristem and shoot apical meristem are responsible for primary growth and elongation of plant body along the axis.
- **Intercalary meristem:** Intercalary meristem located at nodes produce buds and new branches in plants.



Secondary growth in plants

Secondary growth in plants is the function of lateral meristem that is vascular cambium and cork cambium.

- **Seed Germination:** The seed germinates only when favourable conditions for growth exists in the environment. In absence of favourable conditions it goes into a period of suspended growth or rest, called dormancy.
- **Abscission:** Shedding of plant organs like leaves, flowers and fruits etc. from the mature plant.
- **Apical dominance:** Suppression of the growth of lateral buds in presence of apical bud.
- **Dormancy:** A period of suspended activity and growth usually associated with low metabolic rate. Some, seeds undergo a period of dormancy and can germinate only after dormancy period gets over.
- **Phytochrome:** A pigment, found in plants which control the light dependent developmental process.
- **Phytohormone:** Chemical's secreted by plants in minute quantities which influence the physiological activities.
- **Senescence:** The last phase of growth when metabolic activities decrease.
- **Vernalization:** A method of promoting flowering by exposing the young plant to low temperature.
- **Quiescence:** Non germination of a viable seed due to non-availability of proper environmental conditions.
- **Vivipary:** It is the germination of seed while it is still attached to the parent plant and is nourished by it. e.g., Rhizophora and Sonneratia. As the germinating seed forms a seedling. It all down into the mud due to increase in weights. In the mud, lateral roots develops for anchorage.
- **Heterophylly:** Occurrence of more than one type of leaves in plants e.g., larkspur, Coriander leaves of Juvenile plant are different in shape from mature plant.
- **Bolting:** Elongation of internodes prior to flowering in plants like Cabbage.

Photoperiodism

Response of Plants to relative periods of day/ night to induce flowering.

Long Day Plants (LDP): Plants which need exposure to light for period exceeding critical duration e.g., wheat, rice, cucumber.

Short Day Plants (SDP): Plants that need exposure to light for period less than the critical length e.g., Cabbage.

Day Neutral Plants (DNP): There is no correlation between exposure to light duration & induction of flowering e.g., Tomato.

Growth is measurable

- At cellular level, growth is the increase in amount of protoplasm. It is difficult to measure the increase in amount of protoplasm but increase in cell, cell number and cell size can be measured.
- The parameter used to measure growth is increase in fresh weight, dry weight, length, area, and volume and cell number. All parameters are not used for every kind of growth.

Phase of growth

- Formative phase
- Phase of Enlargement
- Phase of maturation

Formative phase: Formative phase is also called as the phase of cell formation or cell division. It occurs at root apex, shoot apex and other region having meristematic tissue. The rate of respiration is very high in the cells undergoing mitosis division in formative phase.

Phase of Enlargement: Phase of Enlargement newly formed cells produced in formative phase undergo enlargement. Enlarging cells also develops vacuoles that further increase the volume of cell. Cell enlargement occurs in all direction with maximum elongation in conducting tissues and fibers.

Phase of maturation: the enlarged cells develops into special or particular type of cells by undergoing structural and physiological differentiation.

Growth Rate

Growth Rate increase in growth per unit time is called growth rate. Growth rate may be arithmetic or geometrical.

Arithmetic Growth

Arithmetic Growth the rate of growth is constant and increase in growth occurs in arithmetic progression- 2, 4, 6, 8 ……. It is found in root and shoot elongation.

$L_t = L_0 + rt$

Length after time = length at beginning + growth rate x time.

Geometric Growth

- Here initial growth is slow and increase rapidly thereafter. Every cell divides. The daughter cells grow and divide and the granddaughter cells that result into exponential growth.
- Geometrical growth is common in unicellular organisms when growing in nutrient rich medium.

- Sigmoid growth curve consists of fast dividing exponential phase and stationary phase. It is typical of most living organisms in their natural environment.

Exponential growth can be represented as follows:

$W_1 = W_0e^{rt}$. W_1 = final size, W_0 = initial size, r = growth rate, t = time of growth and e is the base of natural logarithms (2.71828).

- Quantitative comparison between the growth of living system can be made by
- Measurement and comparison of total growth per unit time is called the absolute rate.
- The growth of given system per unit time expressed on a common basis is called relative growth rate.

Condition for growth

- Necessary condition for growth includes water, oxygen and essential elements. Water is required for cell enlargement and maintaining turgidity. Water also provides medium for enzymatic conditions.
- Protoplasm formation requires water and micro and macronutrients and act as source of energy.
- Optimal temperature and other environmental conditions are also essential for growth of the plant.
- Cells produced by apical meristem become specialized to perform specific function. This act of maturation is called differentiation.
- The living differentiated cells that have lost ability of division can regain the capacity of division. This phenomenon is called dedifferentiation. For example, interfascicular cambium and cork cambium.
- Dedifferentiated cells mature and lose the capacity of cell division again to perform specific functions. This process is called redifferentiation.

Development

It is the sequence of events that occur in the life history of cell, organ or organism which includes seed germination, growth, differentiation, maturation, flowering, seed formation and senescence.

Sequence of development process in plant cell: Different structures develop in different phases of growth as well as in response to environment. The ability to change under the influence of internal or external stimuli is called plasticity. Heterophylly in cotton plant is the example of plasticity.

Plant Growth Regulators

- Plant Growth Regulators are simple molecules of diverse chemical composition which may be indole compounds, adenine derivatives or derivatives of carotenoids.
- Auxin was isolated by F.W. Went from tips of coleoptiles of oat seedlings.

- The 'bakane disease' of rice seedlings is caused by fungal pathogen Gibberella fujikuroi. E. Kurosawa found that this disease is caused due to presence of Gibberellin.
- Skoog and Miller identified and crystallized the cytokinesis, promoting active substance called kinetin.

Auxin

Auxin was first isolated from human urine. It is commonly indole-3-acetic acid (IAA). It is generally produced at stem and root apex and migrate to site of action.

Functions:

- Cell enlargement.
- Apical dominance
- Cell division
- Inhibition of abscission
- Induce Parthenocarpy

Gibberellins

Gibberellins are promotery PGR found in more than 100 forms named as GA_1, GA_2, GA_3….. GA_{100} The most common one is GA_3 (Gibberellic Acid).

Functions:

- Cell elongation.
- Breaking of dormancy.
- Early maturity
- Seed germination.

Cytokinins

Cytokinins the plant growth hormone is basic in nature. Most common forms include kinetin, zeatin, etc. They are mainly synthesized in roots.

Functions:

- Cell division and cell differentiation.
- Essential for tissue culture.
- Overcome apical dominance.
- Promote nutrient mobilization.

Ethylene

Ethylene it is a gaseous hormone which stimulates transverse or isodiametric growth but retards the longitudinal one.

Functions:

- Inhibition of longitudinal growth.
- Fruit ripening

- Senescence
- Promote apical dominance

Abscisic Acid

Abscisic Acid it is also called stress hormone or doormen. It acts as a general plant growth inhibitor. Abscisic acid is produced in the roots of the plant and terminal buds at the top of plant.

Function:

- Bud dormancy
- Leaf senescence
- Induce Parthenocarpy
- Seed development and maturation.

NCERT LINE BY LINE QUESTIONS

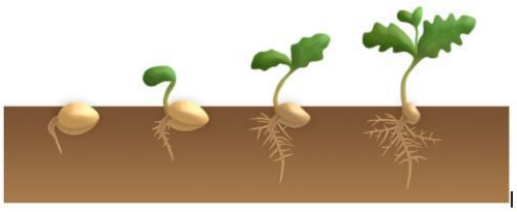
1. Development is **(Pg. 239, E)**
A) Growth B) Differentiation
C) Growth + differentiation D) Growth – differentiation

Paragraph 15.1
Growth

2. Growth of living being is/are- **(Pg. 240, E)**
A) Irreversible B) Increase in size
C) Increase in weight D) All of these
3. Swelling of piece of wood when placed in water is **(Pg. 240, E)**
A) Growth but not development B) Development but not growth
C) No growth and development D) Both growth & development

Paragraph 15.1.1
Plant Growth Generally is Indeterminate

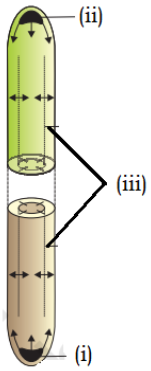
4. Plant grows **(Pg. 240, E)**
A) For a limited time in life
B) For a very long time in life
C) For a very short time in a life
D) For unlimited time throughout life
5. The given figure shows- **(Pg. 240, M)**



A) Germination & development in bean
B) Germination & development in maize
C) Germination & development in pea
D) Germination & development in gram
6. Plant grows throughout the life due to- **(Pg. 240, E)**
A) Meristematic tissue B) Parenchyma tissue
C) Epidermal tissue D) More than one option is correct
7. Open form of growth involves **(Pg. 240, E)**
A) Continuous division in all cells forming new set of cells which divide further necessarily.
B) Division in some cells forming new set of cells which do not divide further necessarily
C) No division at all
D) Division in some cells at the time of injury which forms new set of cells to heal the injury
8. Secondary growth does occur in- **(Pg. 240, E)**
A) All angiosperms and no gymnosperms
B) Some angiosperm and gymnosperms
C) No angiosperm and only gymnosperms
D) All angiosperm and all gymnosperms
9. Secondary growth does not mean- **(Pg. 240, E)**
A) Increase in length of plant B) Increase in girth of plant

C) Increase in diameter in plant D) Both A & C

10.



Choose the correct label- **(Pg. 241, E)**

(i)	(ii)	(iii)
A) Shoot apical meristem	Root apical meristem	Vascular cambium
B) Root apical meristem	Shoot apical meristem	Vascular cambium
C) Shoot parenchyma	Root parenchyma	Vascular bundle
D) Root parenchyma	Shoot parenchyma	Vascular bundle

Paragraph 15.1.2 Growth is Measurable

11. Growth can be measured by measuring increase in – **(Pg. 241, E)**
A) Amount of protoplasm B) Dry weight
C) Cell number D) Both B & C

12. Match the column in respect with the measurement growth- **(Pg. 241, E)**

Column I	Column II
a Maize	i Length
b Watermelon	ii Surface area
c Pollen tube	iii Cell number
d Dorsiventral leaf	iv Cell size

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

Paragraph 15.1.3 Phases of Growth

13. The three phases of growth in correct order is- **(Pg. 241, E)**
A) Meristematic, maturation, elongation
B) Elongation, meristematic, maturation
C) Meristematic, elongation, maturation
D) Elongation, maturation, meristematic

14. Cells in meristematic phase of growth- **(Pg. 241, E)**
A) Have small nuclei
B) Have low plasmodesmatal connections
C) Have thick cell wall
D) Are rich in protoplasm

15. The phase of maturation lies- **(Pg. 241, E)**
A) Proximal to cells undergoing elongation, towards the tip
B) Proximal to cells undergoing elongation, away from the tip
C) Proximal to cells of meristematic zone, away from the tip
D) Proximal to cells of meristematic zone, towards the tip

16. Increased vacuolation is a characteristics of – **(Pg. 242, E)**

A) Meristematic phase
B) Maturation phase
C) Elongation phase
D) All of these

17. Thickest cell wall present in – **(Pg. 242, E)**

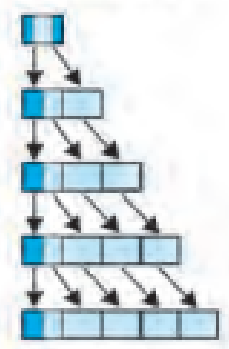
A) Meristematic phase
B) Maturation phase
C) Elongation phase
D) Both B & C

Paragraph 15.1.4
Growth rates

18. Increased growth per unit time is called **(Pg. 242, E)**

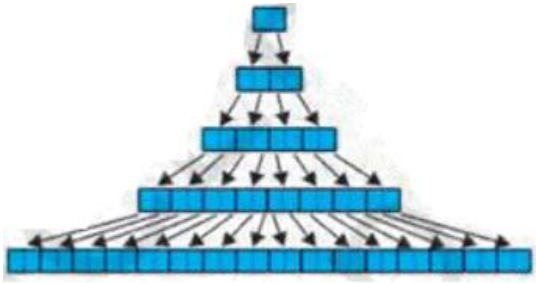
A) Growth index
B) Growth rate
C) Growth efficiency index
D) Both A & C

19. Identify the given figure **(Pg. 242, M)**



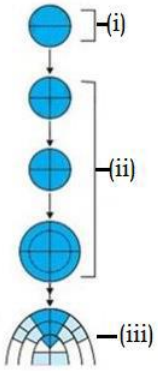
A) Figure shows geometric growth with formula Lt = Lo + rt
B) Figure shows geometric growth with formula W1 = Wo ert
C) Figure shows arithematic growth with formula Lt = Lo + rt
D) Figure shows arithematic growth with formula W1 = Wo ert

20. Identify the given figures **(Pg. 242, M)**



A) Figure shows geometric growth with formula Lt = Lo + rt
B) Figure shows geometric growth with formula W1 = Wo ert
C) Figure shows arithematic growth with formula Lt = Lo + rt
D) Figure shows arithematic growth with formula W1 = Wo ert

21. Choose the correct option with respect to given figures of stages of embryo development **(Pg. 242, M)**



A) (i) is arithmetic growth phase
B) (i) is geometric growth phase

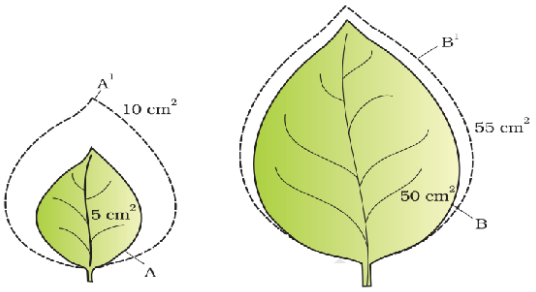
C) (ii) is arithmetic growth phase
D) (ii) is geometric growth phase

22. Choose the correct set of option for size or weight of organ against time **(Pg. 243, E)**
(i) W1 = Wo ert (ii) Lt = Lo + rt
(iii) Linear growth curve (iv) Sigmoid growth curve
(v) Arithmetic growth (vi) Geometric growth
A) (i), (iii), (iv) B) (ii), (iii), (vi)
C) (i), (iv), (vi) D) (ii), (iv), (v)

23. The three phases of sigmoid growth occur in order are – **(Pg. 243, E)**
A) Log, lag, stationary B) Log, stationary, lag
C) Lag, log, stationary D) Lag, stationary, log

24. In the formula W1 = Wo ert , r is – **(Pg. 243, E)**
A) Relative growth rate B) Efficiency index
C) Ability of plant to produce new plant material
D) All of these

25. choose the correct option – **(Pg. 244, E)**



A) Absolute growth rate of A is more than that of B
B) Absolute growth rate of B is more than that of A
C) Relative growth rate of A is more than that of B
D) Relative growth rate of B is more than that of A

Paragraph 15.1.5
Conditions growth

26. The factors affecting growth can be – **(Pg. 244, E)**
A) Water, temperature, light, gravity
B) Water, temperature, light but not gravity
C) Water, light but not temperature & gravity
D) Water, light, gravity but not temperature

Paragraph 15.2
Differentiation, Dedifferentiation and Redifferentiation

27. During differentiation **(Pg. 245, E)**
A) Structural changes occur in nucleus and cytoplasm
B) Functional changes occur in nucleus and cytoplasm
C) Structural changes occur in cell wall and protoplasm
D) All of these

28. Dedifferentiation can be seen in formation of– **(Pg. 245, E)**
A) Intrafascicular parenchyma B) Intrafascicular cambium only
C) Interfascicular cambium only D) Entire vascular cambium

29. Read the following statements – **(Pg. 245, E)**
(i) Cork cambium is a layer of meristem formed from parenchyma cells
(ii) Intrafascicular cambium is a layer of parenchyma cells formed from meristem
(iii) Vascular cambium divide and produce cells that differentiate again
(iv) Plant growth can be determinate or indeterminate

(v) Final structure of cells are never determined by location of cells
(vi) The differentiation in plant cells are closed and dependent on position
How many of the above statements are correct?
A) 3 B) 4 C) 5 D) 6

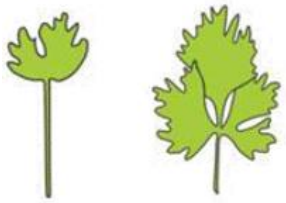
Paragraph 15.3
Development

30. identify the correct labels – **(Pg. 246, E)**
A) (i)-Expansion, (ii)-Plasmatic growth, (iii)-Maturation
B) (ii)-Elongation, (i)-Plasmatic growth, (iii)-Maturation
C) (iii)- Elongation, (ii)-Plasmatic growth, (i)-Maturation
D) (iii)-Expansion, (i)-Plasmatic growth, (ii)-Maturation

31. Plasticity can be seen in – **(Pg. 246, E)**
A) Cotton B) Coriander C) Buttercup D) All of these

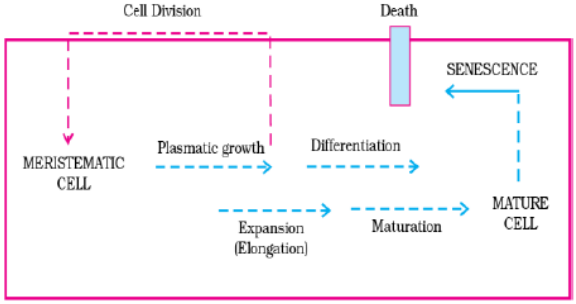
32. Environmental heterophylly can be seen in **(Pg. 246, E)**
A) Larkspur B) Cotton C) Coriander D) Buttercup

33. The given figure show – **(Pg. 246, E)**



A) Developmental heterophylly in buttercups
B) Environmental heterophylly in larkspur
C) Environmental heterophylly in buttercup
D) Developmental heterophylly in Larkspur

34. The figure shows sequence of the development process in **(Pg. 246, E)**



A) A plant cell B) Plant tissue
C) Plant organs D) All of these

35. The given figure show – **(Pg. 246, E)**

A) Developmental heterophylly in buttercups
B) Environmental heterophylly in larkspur
C) Environmental heterophylly in buttercup
D) Developmental heterophylly in larkspur

36. Intrinsic factors responsible for growth & development include – **(Pg. 246, E)**
A) Intracellular (plant growth regulators)
B) Intercellular (genetic)

C) Intercellular (plant growth regulators)
D) More than one option is correct

Paragraph 15.4 Plant Growth Regulation Paragraph 15.4.1 - Characteristics

37. PGRs are – **(Pg. 247, E)**
A) Small, simple, molecules of diverse chemical composition
B) Large, simple molecules of diverse chemical composition
C) Small, complex molecules of diverse chemical composition
D) Large, complex molecules of diverse chemical composition

38. An example of adenine derivative PGR **(Pg. 247, E)**
A) IAA B) Kinetin C) ABA D) Gibberellic acid

39. Gibberellic acid is – **(Pg. 247, E)**
A) Indole compound B) Adenine compound
C) Carotenoid derivative D) Terpene derivative

40. Abscisic acid is – **(Pg. 247, E)**
A) Indole compound B) Adenine compound
C) Carotenoid derivative D) Terpene derivative

41. Kinetin is – **(Pg. 247, E)**
A) Indole compound B) Adenine compound
C) Carotenoid derivative D) Terpene derivative

42. A gaseous PGR is **(Pg. 247, E)**
A) ABA B) Ethylene
C) GA3 D) IAA

43. The PGRs that play important role in plant responses to wounds are – **(Pg. 247, E)**
A) Auxin B) Cytokinin C) Gibberellin D) Abscisic acid

44. PGR Ethylene can fit into – **(Pg. 247, E)**
A) Group of plant growth promoters
B) Group of plant growth inhibitors
C) Both the groups of promoter & inhibitors but mostly inhibitor
D) Both the groups of promoter and inhibitors but mostly promoter

Paragraph 15.4.2 The Discovery of PGR

45. Discovery of how many out of 5 major PGRs was accidental? **(Pg. 247, E)**
A) 2 B) 1 C) 3 D) 5

46. Match the scientist with the plant they worked on – **(Pg. 248, M)**

Column I	Column II
a F.W.Went	i) Canary grass
b E. Kurosawa	ii) Avena(oat)
c Charles & Francis Darwin	iii) Tobacco
d F.S koog	iv) Rice

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

47. Cousins confirmed the release of a volatile substance _(i)_, from ripened _(ii)_ that hastened the ripening of stored unripe_(iii)_. **(Pg. 247, E)**
A) (i)-ABA, (ii)-banana, (iii)-orange
B) (i)-ABA, (ii)-orange, (iii)-banana
C) (i)-C_2H_4, (ii)-banana, (iii)-orange
D) (i)- C_2H_4, (ii)- orange, (iii)-banana

48. Match the PGR with the plants which played role in their discovery – **(Pg. 247, M)**

Column I	Column II
a Auxin	i) Tobacco

b Gibberellin — ii) Rice
c Cytokinin — iii) Orange
d Ethylene — iv) Avena

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

49. Abscisic acid was independent discovered by three different researchers and named as – **(Pg. 247, E)**

A) Inhibitor-A, abscission-III, dormin
B) Inhibitor-C, abscission-II, dormane
C) Inhibitor-B, abscission-II, dormin
D) Inhibitor-B, abscission-II, dormane

50. The term kinetin was given by – **(Pg. 248, E)**

A) Muller et al
B) Kurosawa et al
C) Cousins et al
D) None of these

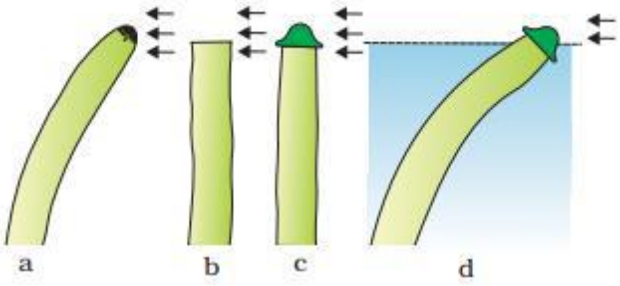
51. The foolish seedling disease of rice is caused by – **(Pg. 248, E)**

A) Nematode
B) Bacteria
C) Fungus
D) Virus

52. Auxin was isolated by _(i)_ from _(ii)_ **(Pg. 248, E)**

(i)	(ii)
A) Francis Darwin	Wleoptile of oat seedling
B) Francis Darwin	Cleoptile of canary grass
C) F.W. Went	Cleoptile of oat seedling
D) F.W. Went	Cleoptile of canary grass

53. The figure shows – **(Pg. 248, E)**



A) Experiment to show that tip of coleoptile produces gibberelin
B) Experiment to show that tip of coleorhiza produces gibberelin
C) Experiment to show that tip of coleorhiza produces auxin
D) Experiment to show that tip of coleoptile produces auxin

Paragraph 15.4.3.1
Auxin

54. Auxin was first isolated from – **(Pg. 248, E)**

A) Xylem sap
B) Phloem sap
C) Human urine
D) Root exudates

55. Synthetic auxins – **(Pg. 248, E)**

A) IAA B) IBA C) NAA D) Both A & C

56. Auxin isolated from plant – **(Pg. 248, E)**

A) NAA B) IAA C) 2, 4-D D) Both A & B

57. Auxins are generally produced by – **(Pg. 248, E)**

A) Growing apex of root & shoot

B) Epidermal tissue of shoots only
C) Xylem secondary cells
D) Endodermal cells of roots & shoot

58. Assertion: Auxin is used in plant propagation widely.
Reason: Auxin initiate rooting.
Choose the correct option - **(Pg. 248, M)**
A) Both Assertion and Reason are correct, and Reason is correct explanation of Assertion
B) Both Assertion and Reason are correct, but Reason doesn't explain Assertion
C) Assertion is correct but Reason is wrong
D) Both Assertion and Reason are incorrect

59. Auxin promote – **(Pg. 248, E)**
A) Rooting in stem cutting
B) Flowering in pineapple
C) Bolting in beet
D) Both A & B

60. Statement-I Auxin prevent fruit and leaf drop at early stage
Statement-II Auxin promote abscission of older mature leaves & fruits
Choose the appropriate option – **(Pg. 248, M)**
A) Statement-I is correct and Statement-II is incorrect
B) Statement-I is incorrect and Statement-II is correct
C) Both Statement-I & Statement-II are correct
D) Both Statement-I & Statement-II are incorrect

61. Auxin – **(Pg. 248, E)**
A) Promotes apical dominance
B) Prevent apical dominance
C) Both promote & prevent apical dominance based on condition
D) Can't say

62. In tea plantation and hedge –making **(Pg. 248, E)**
A) Lateral buds are removed
B) Shoot tips are removed
C) Root tips are removed
D) None of these

63. Auxin – **(Pg. 248, E)**
A) Induces parthenocarpy
B) Act as herbicide
C) Help in cell division
D) All of these

64. 2, 4-D is used to – **(Pg. 248, E)**
A) Kill gymnosperms usually
B) Kill dicot usually
C) Kill monocot usually
D) Both A & B

Paragraph 15.4.3.2
Gibberellins

65. Gibberellins are **(Pg. 249, E)**
A) Promotory PGR
B) Inhibitory PGR
C) Neither promotory nor inhibitory PGR
D) Both promotory and inhibitory PGR

66. Which of the following statements are incorrect – **(Pg. 249, E)**
A) There are more than 100 gibberellins reported
B) GA_3 was one of the gibberellins to be discovered
C) All GA are basic
D) GAs are also reported in fungi

67. Gibberellins is used in grapes for – **(Pg. 249, E)**
A) Increase in length of stalk
B) Increase in girth of stalk
C) Decrease in length of stalk
D) Decrease in girth of stalk

68. Gibberellins – **(Pg. 249, E)**
A) Promotes senescence
B) Delay senescence
C) Neither promote not delay senescence

D) Both promote & delay senescence based on situation

69. Assertion: Spraying gibberellins on fruits extend its market period
Reason: Gibberellins delays senescence
Choose the best option – **(Pg. 249, M)**
A) Both assertion & reason are correct and reason is correct explanation of assertion
B) Both assertion & reason are correct but reason is not explanation of assertion
C) Assertion is correct but reason is wrong
D) Both assertion & reason are in correct

70. Which of these are correct – **(Pg. 249, E)**
A) ABA shows the malting process in brewing industry
B) ABA speeds the malting process in brewing industry
C) GA3 slows the malting process in brewing industry
D) GA3 speeds the malting process in brewing industry

71. Gibberellins is used to improve yields of – **(Pg. 249, E)**
A) Apple B) Grape
C) Sugarcane D) All of these

72. Assertion: Juvenile conifers are sprayed with GA
Reason: GA delays senescence and malting period
Which of the given options are correct? **(Pg. 249, E)**
A) Both assertion & reason are correct and reason is correct explanation of assertion
B) Both assertion & reason are correct but reason is not explanation of assertion
C) Assertion is correct but reason is wrong
D) Both assertion & reason are in correct

73. Bolting is – **(Pg. 249, E)**
A) Yellowing of leaves
B) Node elongation prior to flowering
C) Early maturing and seed production
D) None of these

74. GA promote bolting in – **(Pg. 249, E)**
A) Beet B) Cabbage
C) Plants with rosetle habit D) All of these

Paragraph 15.4.3.3
Cytokinins

75. Cytokinins were discovered as – **(Pg. 249,E)**
A) Kinin B) Kinetin C) Kinesin D) Zentin

76. Kinetin is a modified form of – **(Pg. 249, E)**
A) Purine – guanine B) Pyrimidine – cytosine
C) Purine – adenine D) Pyrimidine – thymine

77. Kinetin was discovered from – **(Pg. 249, E)**
A) Autoclaved herring egg DNA B) Human urine
C) Corn kernel D) None of these

78. Read the following statements regarding cytokinin – **(Pg. 249, E)**
i) Kinetin occurs naturally in plants
ii) Kinetin was discovered from coconut milk
iii) Zeatin does not occur naturally in plants
iv) Zeatin was isolated from human DNA
How many of the statements are incorrect–
A) 1 B) 2 C) 3 D) 4

79. Natural cytokinin may be synthesized in – **(Pg. 249, E)**
A) Root apex
B) Developing shoot buds
C) Young fruits
D) More than one option is correct

80. Cytokinin helps to produce – **(Pg. 249, E)**
A) Chloroplast in leaves
B) Elongation in sugarcane
C) Synchronized fruit set in pineapple
D) Flowering in pineapple

Paragraph 15.4.3.4
Ethylene

81. Ethylene is synthesized in large amounts by – **(Pg. 250, E)**
A) ripening fruit
B) Tissues undergoing senescence
C) Newly developed leaves
D) More than one option is correct

82. Ethylene causes _(i)_ growth of seedling, swelling of axis and apical hook formation in _(ii)_ seedling **(Pg. 250, E)**

	(i)	(ii)
A)	Horizontal	Monocot
B)	Vertical	Dicot
C)	Horizontal	Dicot
D)	Vertical	Monocot

83. Ethylene promotes – **(Pg. 250, E)**
A) Senescence and abscission of flowers
B) Senescence but not abscission of flowers
C) Abscission of flowers but not senescence
D) Neither senescence nor abscission of flowers

84. Ethylene in fruits causes – **(Pg. 250, E)**
A) Rise in rate of respiration called respiratory anti-climactic
B) Rise in rate of respiration called respiratory climactic
C) Fall in rate of respiration called respiratory anti-climactic
D) Fall in rate of respiration called respiratory climactic

85. Ethylene – **(Pg. 250, E)**
A) Promotes seed and bud dormancy
B) Promotes only seed dormancy
C) Promotes only bud dormancy
D) None of these

86. Statement-I Ethylene promotes internode/petiole elongation in deep water rice plants
Statement-II ethylene helps upper part of shoot to remain above water.
Choose the appropriate option – **(Pg. 250, E)**
A) Statement-I is correct and Statement-II is incorrect
B) Statement-I is incorrect and Statement-II is correct
C) Statement-I and Statement-II are correct
D) Statement-I and Statement-II are incorrect

87. Ethylene – **(Pg. 250, E)**
A) Promotes root hair formation and increase in absorption surface
B) Demotes root hair formation and increase in absorption surface
C) Promotes root hair formation and decrease in absorption surface
D) Demotes root hair formation and decrease in absorption surface

88. Ethylene initiates – **(Pg. 250, E)**
A) Flowering in pineapple
B) Flowering in mango
C) Synchronizing fruit-set in pineapple

D) All of these

89. Most widely used source of ethylene – **(Pg. 250, E)**
A) Is ethepene
B) Hasters fruit ripening in tomato and apple
C) In aqueous solution is absorbed on the plant roots
D) More than one option is correct

90. Ethylene promotes – **(Pg. 250, E)**
A) Female flowers in cucumber, increasing the yield
B) Female flowers in cucumber, decreasing the yield
C) male flowers in cucumber, increasing the yield
D) male flowers in cucumber, decreasing the yield

Paragraph 15.4.3.5
Abscisic Acid

91. ABA is – **(Pg. 250, E)**
A) Inhibitor of plant growth and metabolism
B) Inhibitor of plant growth but not metabolism
C) Inhibitor of plant metabolism but not growth
D) Inhibitor of neither plant growth nor metabolism

92. ABA – **(Pg. 250, E)**
A) Inhibit seed germination B) Promote seed dormancy
C) Inhibit seed dormancy D) Both A & B

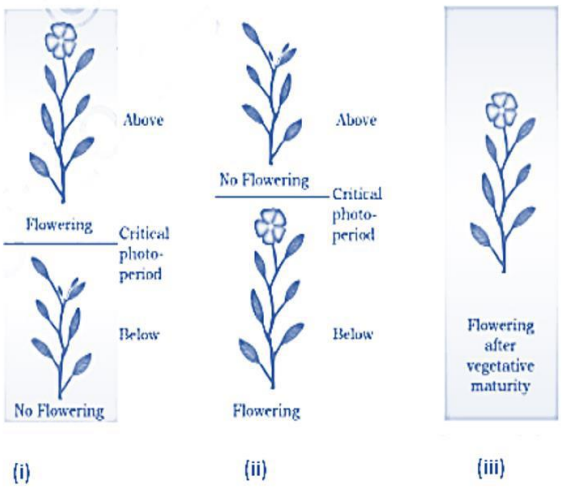
93. ABA is called stress hormone because **(Pg. 250, E)**
A) It causes stress to plant
B) It is released during stress in plant
C) It helps plant to fight stress conditions
D) More than one option is correct

94. ABA stimulates – **(Pg. 251, E)**
A) Stomata opening for more CO_2 exchange
B) Stomata closure to decrease transpiration
C) Stomata opening to cause transpiration & calling effect
D) Both A & C

95. In most situation, ABA acts as an antagonist to- **(Pg. 251, E)**
A) Auxin B) GA C) Cytokinin D) Ethylene

Paragraph 15.5
Photoperiodism

96. Identify the correct labels – **(Pg. 251, E)**



(i)	(ii)	(iii)
A) Long day plant	Day neutral plant	Short day plant
B) Short day plant	Day neutral plant	Long day plant
C) Long day plant	Short day plant	Day neutral plant
D) Short day plant	Long day plant	Day neutral plant

97. Read the given statements – **(Pg. 251, E)**
Statement-I Some plants require a periodic exposure to light to include flowering
Statement-II Some plants are able to measure the duration of exposure to light
Choose the correct statements –
A) Both statements are correct and are about photoperiodism
B) One of the statements is correct about photoperiodism
C) Both statements are correct and is about vernalization
D) One of the statements is correct about vernalization

98. For day neutral plants, there is **(Pg. 252, E)**
A) No correlation between light duration and flowering
B) Direct correlation between light duration and flowering
C) Indirect correlation between light duration and flowering
D) Direct correlation between light intensity and flowering

99. In photoperiodism – **(Pg. 252, E)**
A) Duration of light period matters only
B) Duration of dark period matters only
C) Duration of light and dark period matters
D) Duration of light or dark period doesn't matter

100. Photoperiods are perceived by – **(Pg. 252, E)**
A) Shoot apices B) Flowering apices
C) Nodal buds D) Leaves

Paragraph 15.6
Vernalization

101. Vernalization is – **(Pg. 252, E)**
A) Quantitative dependence of flowering on low temperature
B) Qualitative dependence of flowering on low temperature
C) Quantitative dependence of flowering on high temperature
D) A and B are correct

102. Vernalization can be seen in – **(Pg. 252, E)**
A) Spring varieties of rice B) Spring varieties of wheat
C) Winter varieties of rice D) Winter varieties of wheat

103. Vernalization is also seen in – **(Pg. 252, E)**
A) Biennials like – sugarbeet B) Biennials like maize
C) Perennials like sugarbeet D) Perennials like maize

Paragraph 15.7
Seed Dormancy

104. Some seeds which do not germinate even when external conditions are favorable, are understood to be going through – **(Pg. 252, E)**
A) Dormancy controlled by external environment
B) Dormancy controlled endogenously
C) Dormancy controlled by conditions within the seed
D) More than one option is correct

105. Chemical inhibitions of germination are – **(Pg. 252, E)**
A) Abscisic acid B) Phenolic acid
C) Para-ascorbic acid D) All of these

106. Germination may not occur due to – **(Pg. 252, E)**
i) Hard seed coat ii) Immature embryo
iii) Chemical inhibitors iv) Harsh environment
How many of above are correct?
A) 1 B) 2 C) 4 D) 3

107. Seed coat dormancy is broken by – **(Pg. 252, E)**
A) Mechanical abrasions
B) Microbial actions in gut of animals
C) Certain chemicals
D) More than one option is correct

108. Effects of inhibitory substances on dormancy is removed by application of certain chemicals are – **(Pg. 253, E)**
A) Auxin B) Gibberellic acid C) Cytokinin D) ABA

NEET PREVIOUS YEARS QUESTIONS

1. Fruit and leaf drop at early stages can be prevented by the application of **[2017]**
(a) Ethylene (b) Auxins (c) Gibberellic acid (d) Cytokinins

2. The Avena curvature is used for bioassay of **[2016]**
(a) ABA (b) GA3 (c) IAA (d) Ethylene

3. Typical growth curve in plants is **[2015]**
(a) Linear (b) Stair-steps shaped (c) Parabolic (d) Sigmoid

4. What causes a green plant exposed to the light on only one side, to bend toward the source of light as it grows? **[2015]**
(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.

5. Auxin can be bioassayed by **[2015]**
(a) Hydroponics (b) Potometer
(c) Lettuce hypocotyl elongation (d) Avena coleoptile curvature

6. 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? **[2014]**
(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.

7. A few normal seedlings of tomato were kept in a dark room. After a few days they were found to have become white coloured like albinos. Which of the following terms will you use to describe them? **[2014]**
(a) Mutated (b) Embolised (c) Etiolated (d) Defoliated

8. Which one of the following growth regulators is known as 'stress hormone'? **[2014]**
(a) Abscissic acid (b) Ethylene (c) GA3 (d) Indole acetic acid

9. What is the site of perception of photoperiod necessary for induction of flowering in plants?
(1) Lateral buds (2) Pulvinus (3) Shoot apex (4) Leaves **[NEET-2019]**

10. 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? **[NEET-2019]**
(1) Auxin and Ethylene (2) Gibberellin and Cytokinin
(3) Gibberellin and Abscisic acid (4) Cytokinin and Abscisic acid

11. Removal of shoot tips is a very useful technique to boost the production of tea-leaves. This is because:- **[NEET-2019 ODISSA]**
(1) Gibberellins prevent bolting and are inactivated
(2) Auxins prevent leaf drop at early stages
(3) Effect of auxins is removed and growth of lateral buds is enhanced.
(4) Gibberellins delay senescence of leaves.

12. In order to increase the yield of sugarcane crop, which of the following plant growth regulators should be sprayed? **[NEET-2019 ODISSA]**
(1) Ethylene (2) Auxins (3) Gibberellins (4) Cytokinins

13. Who coined the term 'Kinetin' ? **[NEET-2020 COVID]**
(1) Skoog and Miller (2) Darwin (3) Went (4) Kurosawa

14. Inhibitory substances in dormant seeds cannot be removed by subjecting seeds to: **[NEET2020 COVID]**
(1) Gibberellic acid (2) Nitrate (3) Ascorbic acid (4) Chilling conditions

15. Match the following concerning the activity/function and the phytohormone involved **[NEET-2020 COVID]**

(a) Fruit ripener (i) Abscisic acid
(b) Herbicide (ii) GA_3
(c) Bolting agent (iii) 2, 4-D
(d) Stress hormone (iv) Ethephon

Select the correct option from following :-
(1) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i) (2) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
(3) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i) (4) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)

16. Name the plant growth regulator which upon spraying on sugarcane crop, increase the length of stem, thus increasing the yield of sugarcane crop. **[NEET-2020]**
1) Abscisic acid 2) Cytokinin 3) Gibberellin 4) Ethylene

17. The process of growth is maximum during **[NEET-2020]**
1) Dormancy 2) Log phase 3) Lag phase 4) Senescence

18. Which of the following is not an inhibitory substance governing seed dormancy? **[NEET-2020]**
1) Para-ascorbic acid 2) Gibberellic acid 3) Abscisic acid 4) Phenolic acid

19. Plants follow different pathways in response to environment or phases of life to form different kinds of structures. This ability is called: **[NEET-2021]**
(1) Flexibility 2) Plasticity 3) Maturity 4) Elasticity

20. The plant hormone used to destroy weeds in a field is **[NEET-2021]**
1) NAA 2) 2, 4- D 3) IBA 4) IAA

21. The site of perception of light in plants during photoperiodism is: [NEET-2021]
1) Stem 2) Axillar bud 3) Leaf 4) Shoot apex

22. In the exponential growth equation $N_t = N_o e^{rt}$, e represents [NEET-2021]
1) The base of exponential logarithms 2)The base of natural logarithms
3) The base of geometric logarithms 4)The base of number logarithms

23. The gaseous plant growth regulator is used in plants to: **[NEET-2022]**
1) Speed up the malting process
2) Promote root growth and root hair formation to increase the absorption surface
3) Help overcome apical dominance
4) Kill dicotyledonous weeds in the fields

24. Which one of the following plants does not show plasticity? S**[NEET-2022]**
1) Cotton 2) Coriander 3) Buttercup 4) Maize

25. Auxin is used by gardeners to prepare weed-free lawns. But no damage is caused to grass as auxin
(a) promotes apical dominance.
(b) promotes abscission of mature leaves only.
(c) does not affect mature monocotyledonous plants.
(d) can help in cell division in grasses, to produce growth.

[NEET 2024]

26. Formation of interfascicular cambium from fully developed parenchyma cells is an example for
(a) Differentiation (b) Redifferentiation
(c) Dedifferentiation (d) Maturation

[NEET 2024]

27. Spraying sugarcane crop with which of the following plant growth regulators, increases the length of stem, thus, increasing the yield?
(a) Auxin (b) Gibberellin
(c) Cytokinin (d) Abscisic acid

[NEET 2024]

28. Which hormone promotes internode/petiole elongation in deep water rice?
(a) Kinetin (b) Ethylene
(c) $2,4-\mathrm{D}$ (d) GA_3

[NEET 2023]

29. Spraying of which of the following phytohormone on juvenile conifers helps hastening the maturity period, that leads early seed production?
(a) Gibberellic Acid
(b) Zeatin
(c) Abscisic Acid
(d) Indole-3-butyric Acid

[NEET 2023]

30. Which one of the following phytohormones promotes nutrient mobilization which helps in the delay of leaf senescence in plants?
(a) Ethylene
(b) Abscisic acid
(c) Gibberellin
(d) Cytokinin

[NEET 2025]

31. Read the following statements on plant growth and development.
A. Parthenocarpy can be induced by auxins.
B. Plant growth regulators can be involved in promotion as well as inhibition of growth.
C. Dedifferentiation is a pre-requisite for redifferentiation.
D. Abscisic acid is a plant growth promoter.
E. Apical dominance promotes the growth of lateral buds.

Choose the option with all correct statements.
(a) A, B, C only
(b) A, C, E only
(c) A, D, E only
(d) B, D, E only

[NEET 2025]

NCERT LINE BY LINE QUESTIONS – ANSWERS

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
C	D	C	D	A	A	A	B	A	B
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
D	A	C	D	B	C	B	B	C	B
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
D	C	C	D	C	A	C	C	A	B
31	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
D	B	D	A	A	D	A	B	D	C
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**
B	B	D	C	D	C	D	B	C	D
51	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
C	D	D	C	D	B	A	B	D	C
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**
A	B	D	B	A	C	A	B	B	D
71	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
C	C	D	D	B	C	D	D	D	A
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**
D	C	A	B	D	C	A	D	A	A
91	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**
A	D	D	B	B	C	A	A	C	D
101	**102**	**103**	**104**	**105**	**106**	**107**	**108**		
D	D	A	D	D	C	D	B		

NEET PREVIOUS YEARS QUESTIONS-ANSWERS

1 (b) **2** (c) **3** (d) **4** (c) **5** (d) **6** (b) **7** (c) **8** (a) **9** (4) **10** (1)
11 (3) **12** (3) **13** (1) **14** (3) **15** (3) **16** (3) **17** (2) **18** (2) **19** (2) **20** (2)
21 (3) **22** (2) 23 (2) 24 (4)25(c) 26(c) 27(b) 28(b) 29(c) 30(d) 31.(a)

NEET PREVIOUS YEARS QUESTIONS-EXPLANATIONS

1. (b) Auxins helps to prevent premature leaf and fruit fall.
2. (c) Auxin has been clearly demonstrated in the leaf sheath or coleoptile of oat plant (*Avena sativa*). This plant coleoptile has been used for the test of hormone auxin (IAA) participating in the growth of the plant.
3. (d) Sigmoid growth curve maintains equilibrium with carrying capacity. It forms asymptote stage in plants.
4. (c) Auxin stimulates cell elongation. It accumulates on the shaded side which results in more elongation of cells towards shaded side of the plant. This causes bending of the plant towards source of light.
5. (d) Avena coleoptile curvature is used for the bioassay of auxin.
6. (b)
7. (c) Etiolation is depigmentation of leaf when plant is placed in dark for more than 36 hrs.

8. (a) Abscisic Acid (ABA) is called stress hormone which works in adverse environmental conditions when there is low water content in atmosphere or in drought conditions. ABA causes the stomatal closure of leaves due to which the water loss by the plant is minimized.

16. Gibberellin are useful for , increase the length of stem and crop yield in sugarcane

17. The process of growth is maximum during log phase

18. Gibberellic acid is growth promoting hormone its, promotes seed germination

19. Plants show plasticity which means the ability of plant to follow different pathways and produce different structures in response to environment.

20. 2, 4-D

21. The site of perception of light during photoperiodism is Leaf

22 In the exponential growth equation $N_t = N_0ert$, e represents the base of natural logarithms

N_t = Population density after time t
N_0 = Population density at time zero
r = Intrinsic rate of natural increase called biotic potential.

23 Gaseous Hormone – Ethylene is used to promote root growth and root hair formation to increase the absorption surface

GAs Speed up the malting process

Cytokinins help overcome apical dominance

2,4 -D kill dicotyledonous weeds in the fields

NCERT - XI Page No – 250

24. Cotton, coriander, Buttercup show plasticity, whereas Maize doesn't show plasticity

25.Ans.(c)
Explanation
Auxin does not affect mature monocot plants. In monocots, especially grasses show limited translocation and cause rapid degradation of external auxin.

26.Ans.(c)
Explanation
The phenomenon of formation of interfascicular cambium from fully differentiated parenchyma cells is called dedifferentiation

27.Ans.(b)
Explanation
Sugarcanes store carbohydrate as sugar in their stems. Spraying sugarcane crop with gibberellins increases the length of the stem, thus increasing the yield.

28.Ans.(b)
Explanation
The hormone that promotes internode/petiole elongation in deep water rice is Ethylene.
Ethylene is a plant hormone that plays a critical role in growth and development, including responses to environmental stimuli. In the case of deep water rice, when the plants are submerged, the ethylene concentration increases and promotes rapid internodal elongation,
which allows the plant to keep its leaves above the water surface.
So, the correct answer is Option b - Ethylene.

29.Ans.(c)
Explanation
Gibberellic acid (GA) is a plant hormone that stimulates cell elongation, germination, and influences a variety of developmental processes, including maturation and seed production. In the forestry industry, it is often used to hasten the maturity period and stimulate early seed production in juvenile conifers.

30.Ans.(d)
Explanation

Cytokinins promote nutrient mobilisation which helps in the delay of leaf senescence.

31.Ans.(a)
Explanation

- A. True - Auxins can induce parthenocarpy (formation of seedless fruits).
- B. True - Plant growth regulators can be involved in promotion as well as inhibition of growth.
- C. True - Dedifferentiation is necessary before a cell can re-differentiate.
- D. Incorrect - Abscisic acid (ABA) is a growth inhibitor, not a promoter.
- E. Incorrect - Apical dominance (due to auxin) inhibits lateral bud growth.

About us

BioResire (NEET | CSIR NET | Biotech Internships) is a life sciences research and training organization dedicated to bridging the gap between academic learning and industry skills. We provide internships, projects, and programs in Bioinformatics, Biotechnology, Molecular Biology, Cancer Research, Neuroscience, and related fields, helping students build job-oriented scientific careers.

"The future belongs to those who explore the unseen — where biology meets innovation and discovery begins."