CHAPTER

# Plant Growth and Development

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**1.** Refer the functions of the growth hormones given below.

I. Cell division
II. Cell enlargement
III. Pattern formation
IV. Tropic growth
V Flowering
VI. Fruiting
VII. Seed germination
VIII. Response to wound
IX. Response to stresses of biotic and abiotic origin

Identify the functions of growth promoters and growth inhibitors from the above.

| | Functions of growth promoters | Functions of growth inhibitor |
|---|---|---|
| (a) | I, II, VII, IX | III, IV, V, VI, VII |
| (b) | VIII, IX | I, II, III, IV, V, VI, VII |
| (c) | I, II, III, IV, V, VI, VII | VIII, IX |
| (d) | I, II, III, IV, V, VI, VII, IX | VIII |

**2.** Match the column A (Scientists) with column B (Discovery).

| | Column-A | Column-B |
|---|---|---|
| I. | C. Darwin and F. Darwin | A. Cytokinin |
| II. | Miller and Skoog | B. ABA |
| III. | F.W. Went | C. $C_2H_4$ |
| IV. | Kurosawa | D. Auxin |
| | | E. GA |

| | I | II | III | IV |
|---|---|---|---|---|
| (a) | D | A | C | E |
| (b) | D | A | E | B |
| (c) | C | A | B | D |
| (d) | E | D | A | C |

**3.** Refer the statements given below.

**Statement-I :**

Confirmation of the release of volatile substance from ripened oranges that hastened the ripening of stored unripe bananas.

**Statement-II :**

Callus formation takes place from internodal segments of tobacco stem with the auxin and the nutrient medium containing extracts of vascular tissues/yeast/coconut milk/ DNA. Later, cytokinesis promoting substance was identified, crystallized and named as Kinetin.

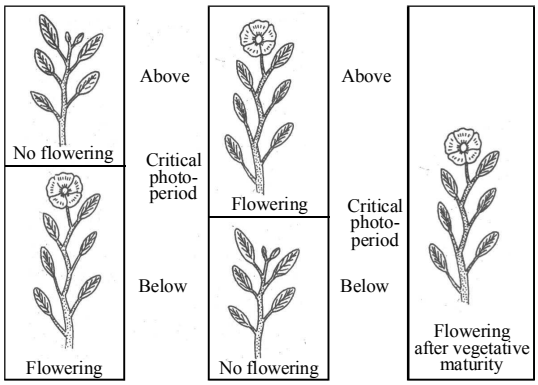
**Statement-III :**

Reporting of appearance of symptoms of bakane/foolish seedling disease caused by fungus, Gibberella fujikuroi, in uninfected seedling when they were treated with sterile filtrates of the fungus. The active substances were later identified as GA.

Choose the correct option.

| | I | II | III |
|---|---|---|---|
| (a) | Miller + Skoog | Cousins | Kurosawa |
| (b) | Kurosawa | Cousins | Miller + Skoog |
| (c) | Cousins | Kurosawa | Miller + Skoog |
| (d) | Cousins | Miller + Skoog | Kurosawa |

**4.** The picture below shows three different types of plants (marked as P-I, P-II and P-III) which flower on the basis of their critical photoperiod. Now identify these plants (P-I, II and III).



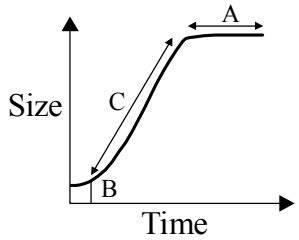

(a) P-I = Long day plant; P-II = Short day plant; P-III = Day neutral plant

(b) P-I = Short day plant; P-II = Long day plant; P-III = Day neutral plant

(c) P-I = Short day plant; P-II = Short day plant; P-III = Day neutral plant

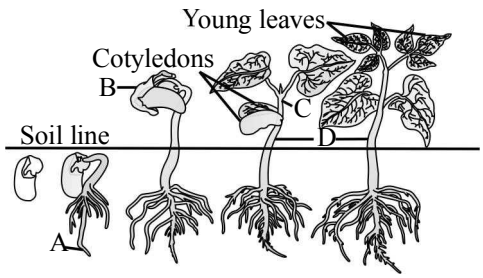
(d) P-I =Long day plant; P-II = Long day plant; P-III = Day neutral plant

**5.** The picture below shows a graph drawn on the parameters of growth versus time. A, B, C respectively represent




| | A | B | C |
|---|---|---|---|
| (a) | Exponential phase | Log phase | Steady state phase |
| (b) | Steady state phase | Lag phase | Log phase |
| (c) | Log phase | Steady state phase | Logarithmic phase |
| (d) | Log phase | Lag phase | Steady state phase |

**6.** Refer the diagram which shows the stages of seed germination.




Identify A, B, C and D.

| | A | B | C | D |
|---|---|---|---|---|
| (a) | Plumule | Cotyledons | Hypocotyl | Epicotyl |
| (b) | Radicle | Seed coat | Epicotyl | Hypocotyl |
| (c) | Hypocotyl | Cotyledons | Epicotyl | Root hair |
| (d) | Root hair | Cotyledons | Plumule | Hypocotyl |

**7.** Match the plant hormones listed in column-I with their major role listed in column-II. Select the correct option from the codes given below.

| | Column-A | Column-B |
|---|---|---|
| (A) | Auxin | (I) Fruit ripening |
| (B) | Cytokinins | (II) Phototropism |
| (C) | Abscisic acid | (III) Antagonist to GAs |
| (D) | Ethylene | (IV) Stomatal opening and closing |
| | | (V) Growth of lateral buds |

(a) A-IV; B-V; C-III; D-I

(b) A-II; B-IV; C-III, IV; D-I

(c) A-I; B-V; C-III, IV; D-I

(d) A-III, IV; B-V; C-II; D-I

**8.** Match the growth regulators in column-I with the processes in column-II and choose the correct combination.

| | Column-I | Column-II |
|---|---|---|
| (A) | Auxin | (i) Colouring test in lemon |
| (B) | Gibberellin | (ii) Cell division test in plants |
| (C) | Cytokinin | (iii) Avena curvature test |
| (D) | Ethylene | (iv) Dwarf corn test |

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

**9.** Which of the following is **incorrectly** matched?
(a) Explant – Excised plant part used for callus formation
(b) Cytokinins – Root initiation in callus
(c) Somatic embryo – Embryo produced from a vegetative cell
(d) Anther culture – Haploid plants

**10.** Match list I and list II and select the correct option.

| **List-I** | **List-II** |
|---|---|
| (A) Auxin | (I) Herring sperm DNA |
| (B) Cytokinin | (II) Inhibitor of growth |
| (C) Gibberellin | (III) Apical dominance |
| (D) Ethylene | (IV) Epinasty |
| (E) Abscisic acid | (V) Induces amylase synthesis |

(a) A-III, B-I, C-V, D-IV, E-II
(b) A-IV, B-V, C-I, D-III, E-II
(c) A-II, B-I, C-V, D-III, E-IV
(d) A-III, B-I, C-V, D-II, E-IV

**11.** Match the following and choose the correct combination

| **Column I** | **Column II** |
|---|---|
| (1) Zeatin | 1. Flowering hormone |
| (2) Florigen | 2. Synthetic auxin |
| (3) IBA | 3. Cytokinin |
| (4) NAA | 4. Natural auxin |

(a) A – 3, B – 4, C – 1, D – 2
(b) A – 2, B – 1, C – 4, D – 3
(c) A – 1, B – 2, C – 3, D – 4
(d) A – 3, B – 1, C – 4, D – 2

**12.** Which one of the following pairs, is not correctly matched?
(a) Abscisic acid — Stomatal closure
(b) Gibberellic acid — Leaf fall
(3) Cytokinin — Cell division
(4) IAA — Cell wall elongation

**13.** Which one of the following pairs is incorrectly matched?
(a) Adenine derivative - kinetin
(b) Carotenoid derivative - ABA
(c) Terpenes - IAA
(d) Indole compounds - IBA

**14.** Match the following and choose the correct combination from the options given.

| **Column I (Growth Regulator)** | **Column II (Action)** |
|---|---|
| (A) Abscisic acid | 1. Delays leaf senescence |
| (B) Ethylene | 2. Inhibits seed germination |
| (C) Cytokinin | 3. Herbicide |
| (D) Auxin | 4. Hastens fruit ripening |

(a) A-2, B-4, C-1, D-3
(b) A-1, B-2, C-3, D-4
(c) A-2, B-3, C-4, D-1
(d) A-2, B-1, C-3, D-4

**15.** Match the following columns and choose the correct combination

| **Column A** | **Column B** |
|---|---|
| (A) Zeatin | (i) Flowering hormone |
| (B) Florigen | (ii) Natural auxin |
| (C) IBA | (iii) Cytokinin |
| (D) NAA | (iv) Synthetic auxin |

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

# Solutions

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **1.** | **(c)** | **2.** | **(a)** | **3.** | **(d)** | **4.** | **(b)** | **5.** | **(b)** |
| **6.** | **(b)** | **7.** | **(c)** | **8.** | **(a)** | **9.** | **(b)** | **10.** | **(a)** |
| **11.** | **(d)** | **12.** | **(b)** | **13.** | **(c)** | **14.** | **(a)** | **15.** | **(a)** |