

QB365  
Important Questions - Plant Growth and Development  
11th Standard CBSE

**Biology**

Reg.No. : 

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Time : 01:00:00 Hrs

Total Marks : 50

**Section-A**

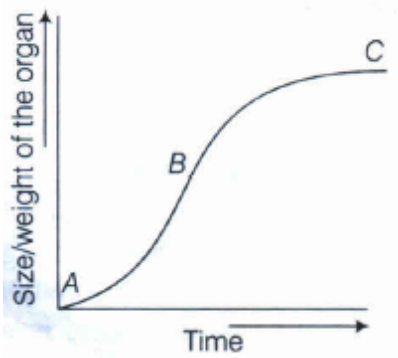
- 1) In which region of the plant production of auxin in abundant amount occurs? 1
- 2) In most plants, the terminal bud suppresses the development of lateral buds into branches. What is this phenomenon called? Name one phytohormone that can promote this phenomenon 1
- 3) Write the correct chronological sequence of development stages in plants? 1
- 4) In which type of growth, all daughter cells produced after mitotic cell division grow and divide? 1
- 5) In some germinating seeds, enzymes mobilise nutrients present in the cotyledons. Name the phytohormone that stimulates the production of such enzymes. 1
- 6) What special ability is possessed by cytokinin as PGR? 1
- 7) Mention the name of the growth regulator, which was first isolated from endosperm of maize, Give its main biological activity 1
- 8) What are the plant organs responsible for the perception of light variation? What is the pigment responsible for this perception? 1
- 9) Name the hormones involved in photoperiodism. 1
- 10) Justify growth of the plant is unique. 1

**Section-B**

- 11) Explain whether the growth in plants is definite or indefinite. 2
- 12) The rice seedlings infected with fungus *Gibberella fujikuroi* is called foolish seedlings? 2
- 13) What conditions can induce the phenomenon of bolting naturally and how can it be induced artificially? 2
- 14) In an experiment, the callus produced from internodal segments did not proliferate until coconut water was added. Give person 2
- 15) How do IBA and 2, 4-D are used in agriculture? 2
- 16) Explain what is meant by the terms auxin precursors, anti-auxins, free auxins and bound auxins 2
- 17) Why do cut leaves dipped in cytokinins stay green for longer duration? 2
- 18) In most plants, the terminal bud suppresses the development of lateral buds. What is this phenomenon called? Name the phytohormone that can promote the phenomenon. 2

19) In the figure of sigmoid growth curve below label segments A, B and C.

2



20) What are meristems? How does the primary growth differ from that of secondary growth?

2

### Section-C

21) *Nicotiana glauca*, (tobacco) a short-day plant, when exposed to more than the critical period of light fails to flower. Explain.

5

22) What are plant growth regulators? Name any four different chemical nature of them with one example of each.

5

23) Mention the phenomenon of growth in plants. Explain the phases of growth in detail.

5

24) Define differentiation? Also, give details about how can you distinguish between dedifferentiation and redifferentiation?

5

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### Section-A

1) Meristematic region of shoot

1

2)

1

The phenomenon is called apical dominance. Auxin is the phytohormone involved in promoting this phenomenon

3)

1

The correct chronological sequence of developmental stages in plants is Germination - Vegetative growth - Flowering - Fruiting

4) In geometric growth, all daughter cells produced after mitotic cell division undergo cell division.

1

5)

1

Gibberellic acid is the phytohormone that induces production of hydrolytic enzymes (protease, amylase, lipase) in the endosperm of germinating seeds

6) Cytokinin has the ability to initiate morphogenesis in plant tissues and organs

1

7)

1

Zeatin is the growth regulator isolated from endosperm. It controls cell division (cytokinesis) even in non-meristematic tissues

8)

1

Leaves are mainly responsible for perception of light intensity in plants. The pigment that receives this stimulates is called phytochrome.

9) 1  
Florigen is the hormone involved in photoperiodism. Its chemical nature is not yet established. It induces flowering in plants.

10) 1  
Plant growth is unique, as plants retain the capacity to grow throughout their life. This ability is due to the presence of meristems. The cells of meristematic tissue have the capacity to divide and self-perpetuate. This form of growth, where new cells are continuously added to the plant body by the activity of meristems, is called open form of growth.

### Section-B

11) 2  
Growth in plants is indefinite because they have the capacity for unlimited growth throughout their life. This ability of the plants is due to the presence of meristems at certain locations. This type of growth is exhibited by roots, stem and their branches and is called an open form of growth.

12) 2  
The rice seedlings infected with fungus *Gibberella fujikuroi* is called foolish seedlings because these seedlings grow foolishly so tall that they ultimately, fall on ground and result into death of plants

13) 2  
Some plants require specific long day periods or specific cold treatments for flowering. Bolting can be induced artificially the treatment of gibberellins

14) 2  
Callus (i.e., undifferentiated mass of cells) proliferates only when nutrient medium containing auxin was supplemented with coconut milk because it contains kinetin (a cytokinin) which stimulates growth of plants tissues.

15) 2  
IBA and 2,4 are used to induce formation of roots on cutting of many ornamental, horticultural and forest trees. 2,4-D can also be used as a weedicide

16) 2  
The compound, which can be converted into auxin are called auxin precursors. The compounds, which inhibit the actions of auxins, are termed anti-auxins. The auxins, which can easily be extracted, are called free auxins. And auxins, which are hard to extract and need the use of organic solvents, are referred to as bound auxins

17) 2  
Because cytokinins retard ageing of plant organs by promoting protein synthesis and mobilisation of nutrient resources

18) It is called apical dominance. Auxin hormone is responsible for this. 2

19) A-Lag phase, B-Log phase and C-Steady phase. 2

20)

2

Meristems are tissues present in the growing regions of plants.

**Primary growth** refers to the elongation of stems and roots. All plants exhibit primary growth. Root apical meristem and shoot apical meristem are responsible for the primary growth of the plants and principally contribute to the elongation of the plants along their axis.

The growth that makes plants thicker is called **secondary growth**. For example, in dicotyledonous plant and gymnosperms, the lateral meristems, vascular cambium and cork cambium appears later in life.

These are the meristems. Their activity in plants to grow in girth (diameter).

### Section-C

21)

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(i) Some plants require a periodic exposure to alternate light and dark period for its flowering response and this phenomenon is called photoperiodism.

(ii) The requirement of light exposure is critical. the SDP plants when exposed to light period in excess of critical period fail to flower.

(iii) Those plants, which require exposure to light period at critical or more than critical period for its flowering response are called long-day plants.

(iv) Nicotiana tobacum fails to flower if exposed to more than the critical period of light because it is a short-day plant.

22)

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Plant growth regulators are small, simple molecules secreted in minute quantities, that influence various physiological functions in plants. They are of diverse chemical composition.

(i) Indole compounds [such as-indole-3-Acetic Acid (IAA)]

(ii) Adenine derivatives[such as kinetin, 6-furfuryl amino purine]

(iii) Derivatives of carotenoids {such as Abscisic Acid (ABA)}

(iv) Terpenes[such as gibberellic acids]

23)

5

Growth is defined as a permanent or irreversible increase in dry weight, mass or volume of cell, organ or organisms.

Plant growth takes place in three steps or phase-cell division, cell elongation and cell maturation.

(i) Cell Division Phase

(ii) Cell Enlargement Phase

(iii) Cell Maturation Phase

The cells which are derived from root apical meristem and shoot and other meristems undergo certain changes to attain maturity to perform specific functions. This process which leads to maturation of cells is termed as differentiation. During this, the cells undergo a few major structural changes both in their cell walls and protoplasm to perform some specific functions throughout their life.

(i) In plants, some living differentiated cells, e.g. parenchyma can regain the capacity to divide mitotically under certain conditions.

(ii) The product of dedifferentiated cells or tissues which lose the ability to divide is called redifferentiated cells and the term is known as redifferentiation. Secondary xylem and secondary phloem from interfascicular vascular cambium, secondary cortex are the examples of tissues.