



BIOLOGY

BOOKS - KUMAR PRAKASHAN KENDRA

BIOLOGY (GUJRATI ENGLISH)

PLANT GROWTH AND DEVELOPMENT

**Section A Exam Oriented Questions Answers
From Darapn**

1. Which type of curiosity arise in our mind when we think about plant ?



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2. Which type of question arise in our mind in relation to plants?



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3. Explain development in detail.



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4. Define growth and explain it.



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5. Why in plant growth is indeterminate ?



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6. How can we measure growth ?



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7. What are the different phases of growth ?



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8. Describe different types of growth rates.



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9. Give quantitative comparison of growth rate ?



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10. Describe various conditions or factors necessary for growth.



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11. Define differentiation. Also give details about how can you distinguish between dedifferentiation and redifferentiation ?



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12. What would you call the parenchyma cells that are made to divide under controlled laboratory conditions during plant tissue culture ?



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13. Write short note : Development



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14. What is plasticity ? Give example.



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15. Mention the characteristics and types of plant growth regulators.





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16. How were different plant growth regulators discovered ?



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17. Write short note on Auxins.



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18. Write the characteristics and function of Gibberellins.

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19. Write short note on Cytokinins.

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20. Write a explanatory note on Ethylene.

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21. Describe the role of abscisic acid in plant.



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22. What is the role of PGR ?



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23. Write short note on Photoperiodism.



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24. Write short note on vernalisation.



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25. What are the causes of seed dormancy and how it can be removed ?



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26. Give various causes for seed dormancy.



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27. Write short note on removal of seed dormancy.



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Section B Difference Scientific Reasons

1. Give differences :

Phototropism and Photoperiodism:





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2. Give differences :

Short day plants and Long day plants :



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3. Give differences :

Senescence and Ageing :



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4. Give differences :

Photoperiodism and Vernalization :

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5. Water is essential for germination.

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6. Dry seeds do not germinate.

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7. The seeds which are deeply sown in soil or in water logged soils, often fail to germinate.



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8. Plant bend toward the source of light.



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9. When apical bud is removed, the next axial bud begins to grow out.



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10. Some plants flower in summer and some flower in winters.



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11. When a plant culture is grown in a limited amount of nutrient medium, growth is slow in the initial stage (lag phase). It increases rapidly in the exponential phase and again.





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12. Auxins fail to enhance the growth of intact plants.



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13. Gibberellic acid induces reversal of dwarfism in many genetically dwarf plants.



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14. It is appropriate to tell short day plant a long night plant.



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15. Indole-3-acetic acid is not the only naturally occurring auxin.



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16. Rice plants infected by the fungus gibberella fujikuroi grow foolishly tall.



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Section C Definition Explanation Terms Importance

1. Definitions/Explanation:

Abcission :



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2. Definitions/Explanation:

Auxin :



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3. Definitions/Explanation:

Circummutation :



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4. Definitions/Explanation:

Day neutral plant :



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5. Definitions/Explanation:

Primary growth :



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6. Definitions/Explanation:

Secondary growth :



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7. Definitions/Explanation:

Development :



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8. Definitions/Explanation:

Growth regulators :



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9. Definitions/Explanation:

Germination :



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10. Definitions/Explanation:

Senescence/Ageing :



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11. Definitions/Explanation:

Photoperiodism:



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12. Definitions/Explanation:

Etiolated position :



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13. Definitions/Explanation:

Long day plants :



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14. Definitions/Explanation:

Short day plants :



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15. Definitions/Explanation:

Vernalization :



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16. Definitions/Explanation:

Gibberellins :



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17. Definitions/Explanation:

Cytokinins :



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18. Definitions/Explanation:

Growth:



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Section D Textual Exercise

1. Define growth, differentiation, development, dedifferentiation, redifferentiation, determinate growth, meristem and growth rate.



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2. Why is not any one parameter good enough to demonstrate growth throughout the life of a flowering plant?



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3. Describe briefly :

(a) Arithmetic growth

(b) Geometric growth

(c) Sigmoid growth curve

(d) Absolute and relative growth rates



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4. List five main groups of natural plant growth regulators. Write a note on discovery, physiological functions and agricultural/horticultural applications of any one of them.



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5. What do you understand by photoperiodism and vernalisation?



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6. Why is abscisic acid also known as stress hormone ?



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7. 'Both growth and differentiation in higher plants are open'. Comment.



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8. 'Both a short day plant and a long day plant can produce/can flower simultaneously in a given place'. Explain.



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9. Which one of the plant growth regulators would you use if you are asked to:

(a) Induce rooting in a twig

(b) Quickly ripen a fruit

(c) Delay leaf senescence

(d) Induce growth in axillary buds

(e) 'Bolt' a rosette plant

(f) Induce immediate stomatal closure in leaves.



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10. Would a defoliated plant respond to photoperiodic cycle ? Why?



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11. What would be expected to happen if :

- (a) GA_3 is applied to rice seedlings
- (b) dividing cells stop differentiating
- (c) a rotten fruit gets mixed with unripe fruits
- (d) you forget to add cytokinin to the culture medium.



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Section E Solution Of Ncerty Exemplar Multiple Choice Questions Mcqs

1. Ethylene is used for

- A. Retarding ripening of tomatoes
- B. Hastening of ripening of fruits
- C. Slowing down ripening of apples
- D. Both (B) and (C)

Answer: B



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2. Coconut water contains

A. ABA

B. Auxin

C. Cytokinin

D. Gibberellin

Answer: C



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3. The affect of apical dominance can be overcome by which of the following hormone ?

A. IAA

B. Ethylene

C. Gibberellin

D. Cytokinin

Answer: D



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4. Match the following:

Column-I		Column-II	
(a)	IAA	(1)	Herring sperm DNA
(b)	ABA	(2)	Bolting
(c)	Ethylene	(3)	Stomatal closure
(d)	GA	(4)	Weed-free lawns
(e)	Cytokinin	(5)	Ripening of fruits

A. (a - 4), (b - 3), (C-5), (d-2) (e - 1)

B. (a - 5), (b - 3), (C-4), (d - 2) (e - 1)

C. (a - 4), (b - 1), (C-5), (d - 3) (e - 2)

D. (a - 5), (b-3), (c - 2), (d - 1) (e - 4)

Answer: A



5. The term synergistic action of hormones refers to

A. When two hormones act together but bring about opposite effects.

B. When two hormones act together and contribute to the same function.

C. When one hormone affects more than one function.

D. When many hormones bring about any one function.

Answer: B



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6. Apples are generally wrapped in waxed paper to

A. Prevent sunlight for changing its colour

B. Prevent aerobic respiration by checking the entry of O_2 .

C. Prevent ethylene formation due to injury

D. Make the apples look attractive

Answer: B



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7. Growth can be measured in various ways.

Which of these can be used as parameters to measure growth ?

- A. Increase in cell number
- B. Increase in cell size
- C. Increase in length and weight
- D. All the above

Answer: D



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8. Plasticity in plant growth means that

A. Plant roots are extensible.

B. Plant development is dependent on the environment.

C. Stems can extend.

D. None of the above.

Answer: B



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9. To increase sugar production in sugarcane, they are sprayed with

A. IAA

B. Cytokinin

C. Gibberellin

D. Ethylene

Answer: C



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10. ABA acts as antagonistic to

A. Ethylene

B. Cytokinin

C. Gibberellic acid

D. IAA

Answer: C



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11. Monocarpic plants are those which

A. Bear flowers with one ovary

B. Flower once and die

C. Bear only one flower

D. All of the above

Answer: B



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12. The photoperiod in plants is perceived at

A. Meristem

B. Flower

C. Floral buds

D. Leaves

Answer: D



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Section E Solution Of Ncerty Exemplar Very Short Answer Type Questions Vsqs

1. Fill in the places with appropriate word/words.

(a) A phase of growth which is maximum and fastest is



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2. Fill in the places with appropriate word/words.

(b) Apical dominance as expressed in dicotyledonous plants is due to the presence of more in the apical bud than in the lateral ones.



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3. Fill in the places with appropriate word/words.

(c) In addition to auxin, a must be supplied to culture medium to obtain a good callus in plant tissue culture.



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4. Fill in the places with appropriate word/words.

(d) of a vegetative plants are the sites of photoperiodic perception.



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5. Plant growth substances (PGS) have innumerable practical applications. Name the PGS you should use to

- (a) Increase yield of sugarcane.
- (b) Promote lateral shoot growth.
- (c) Cause sprouting of potato tuber.
- (d) Inhibit seed germination.



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6. A primary root grows from 5 cm to 19 cm in a week. Calculate the growth rate and relative growth rate over the period.



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7. Gibberellins were first discovered in Japan when rice plants were suffering from bakane (the foolish seedling disease) caused by a fungus *Gibberella fujikuroi*.

(a) Give two functions of this phytohormone.

(b) Which property of Gibberellin caused foolish seedling disease in rice?



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8. Gibberellins promote the formation of flowers on genetically plants in Cannabis

whereas ethylene promotes formation of
flowers on genetically plants.



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9. Classify the following plants into Long Day Plants (LDP), Short Day Plants (SDP) and Day Neutral Plants (DNP) Xanthium, Henbane (*Hyoscyamus niger*), Spinach, Rice, Strawberry, Bryophyllum, Sunflower, Tomato, Maize.



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10. A farmer grows cucumber plants in his field. He wants to increase the number of female flowers in them. Which plant growth regulator can be applied to achieve this?



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11. Where are the following hormones synthesized in plants ?

(a) IAA (b) Gibberellins (c) Cytokinins



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12. In botanical gardens and tea gardens, gardeners trim the plants regularly so that they remain bushy. Does this practice have any scientific explanation ?



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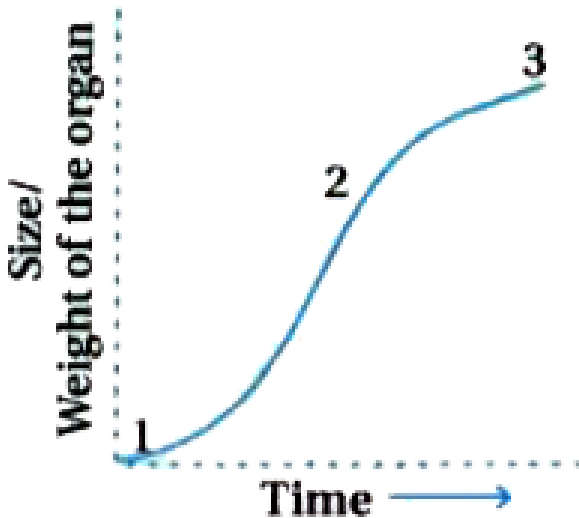
13. Light plays an important role in the life of all organism. Name any three physiological processes in plants which are affected by light.





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14. In the figure of sigmoid growth curve given below, label segments 1, 2 and 3.



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15. Growth is one of the characteristic of all living organism ? Do unicellular organism also grow? If so, what are the parameters ?



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16. The rice seedlings infected with fungus *Gibberella fujikuroi* is called foolish seedlings? What was the reason behind it?



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Section E Solution Of Ncert Exemplar Short Answer Type Questions

1. *Nicotiana tabacum*, a short Day Plant, when exposed to more than critical period of light fails to flower. Explain.



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2. What are the structural characteristics of
(a) Meristematic cells near root tip

(b) The cells in the elongation zone of the root



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3. Does the growth pattern in plants differ from that in animals? Do all the parts of plant grow indefinitely? If not, name the regions of plant, which can grow indefinitely.



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4. Explain in 2-3 lines each of the following terms with the help of examples taken from different plant tissues.

(a) Differentiation

(b) De-differentiation

(c) Re-differentiation



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5. Auxins are growth hormones capable of promoting cell elongation. They have been

used in horticulture to promote growth, flowering and rooting. Write a line to explain the meaning of the following terms related to auxins.

(a) auxin precursors

(b) antiauxins

(c) synthetic auxins



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6. The role of ethylene and abscisic acid is both positive and negative. Justify the

statement.



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7. While experimentation, why do you think it is difficult to assign any affect seen to any single hormone ?



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8. What is the mechanism underlying the phenomenon by which the terminal/apical bud

suppresses the growth of lateral buds ?

Suggest measures to overcome this phenomenon.



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9. In animals there are special glands secreting hormones, whereas there are no glands in plants. Where are plant hormones formed ? How are the hormones translocated to the site of activity ?



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10. Many discoveries in science have been accidental. This is true for plant hormones also. Can you justify this statement by giving an example ? Also what term is used for such accidental findings ?



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11. To get a carpet like grass lawns are mowed regularly. Is there any scientific explanation for this ?



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12. In a slide showing different types of cells can you identify which type of the cell may be meristematic and the one which is incapable of dividing and how ?



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13. A rubber band stretches and reverts back to its original position. Bubble gum stretches,

but it would not return to its original position.

Is there any difference between the two processes ? Discuss it with respect to plant growth. [Hint : Elasticity (reversible) Plasticity (irreversible)]



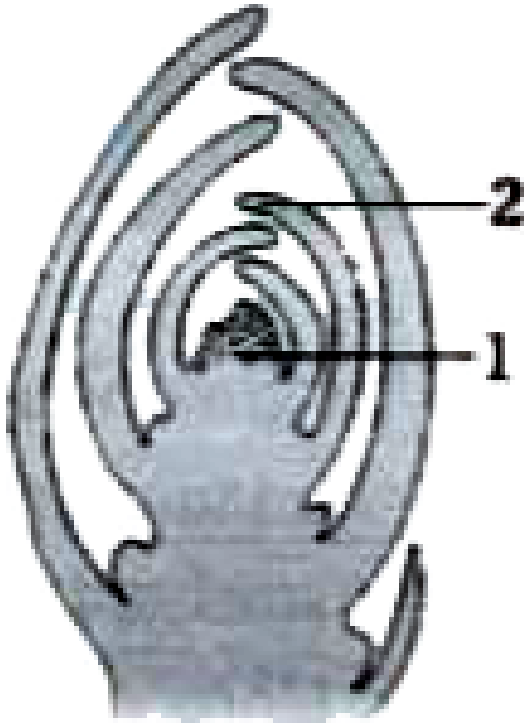
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14. Label the diagram

(A) This is which part of a dicotyledonous plant ?

(B) If we remove part 1 from the plant, what

will happen ?



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15. Both animals and plants grow. Why do we say that growth and differentiation in plants is open and not so in animals? Does this statement hold true for sponges also?

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16. Define parthenocarpy. Name the plant hormone used to induce parthenocarpy.

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17. While eating watermelons, all of us wish it was seedless. As a plant physiologist can you suggest any method by which this can be achieved.



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18. A gardener finds some broad-leaved dicot weeds growing in his lawns. What can be done to get rid of the weeds efficiently ?



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19. On germination a seed first produces shoots with leaves, flowers appear later,

(A) Why do you think this happens ?

(B) How is this advantageous to the plant ?



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20. Fill in the blanks :

(1) Maximum growth is observed in phase.



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21. Fill in the blanks :

(2) Apical dominance is due to



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22. Fill in the blanks :

(3) initiate rooting



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23. Fill in the blanks :

(4) Pigment involved in photo-perception in flowering plants is



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Section E Solution Of Ncerty Exemplar Long Answer Type Questions

1. Some varieties of wheat are known as spring wheat while others are called winter wheat. Former variety is sown and planted in spring

and is harvested by the end of the same season. However, winter varieties, if planted in spring, fail to flower or produce mature grains within a span of a flowering season. Explain, why?



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2. It is known that some varieties of wheat are sown in autumn but are harvested around next mid summer.

(A) What could be the probable reason for

this?

(B) What term is used for this promotion of lowering under low temperature ?

(C) Which plant hormone can replace the cold treatment?



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3. Name a hormone which

(A) is gaseous in nature

(B) is responsible for phototropism

(C) induces femaleness in flowers of cucumber

(D) is used for killing weeds (dicots)

(E) induces flowering in long day plants



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Questions From Module Important Mcq For Neet

1. Fransis Darwin studied coleoptile in plant.

A. Canary grass

B. Carrot grass

C. Maize

D. Barley

Answer: A



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2. E.W scientist, isolated auxin.

A. Darwin

B. F.W. Went

C. E. Corcosova

D. F.Schoog

Answer: B



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3. is called 'Stress hormone'.

A. Ethylene

B. Cytokinin

C. ABA

D. Gibberelin

Answer: C



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4. In plants available light period do not have any effect.

A. Day Neutral

B. Long day

C. Short day

D. None

Answer: A



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5. Graph of time against growth is

A. J

B. S - curve

C. Constant linear growth

D. None

Answer: B



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Objective Section Multiple Choice Questions

Mcqs

1. Who isolated auxin from tips of colioptiles of oat seedling ?

A. Charles Darwin

B. Francis Darwin

C. F. W. Went

D. Skoog

Answer: C



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2. Gibberellic acids are

A. terpenes

B. kinetin

C. purine

D. ethylene

Answer: A



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3. The phenomenon of heterophylly is

- A. maturation
- B. plasticity
- C. vernalization
- D. elasticity

Answer: B



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4. Xylem differentiation is controlled by

A. Auxin

B. GA

C. Cytokinin

D. Ethylene

Answer: A



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5. Ethephon hastens fruit ripening in

A. Guava and chillies

B. Tomatoes and apples

C. Grapes and walnut

D. cotton and cherry

Answer: B



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6. The rise in rate of respiration during ripening of fruit

A. Respiratory climactic

B. Reopening climactic

C. Fruit climactic

D. Seed climactic

Answer: A



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7. Biennials are

A. Monocarpic plants

B. Sugarbeet

C. Carrots

D. All of these

Answer: D



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8. Phase of elongation is characterized by

- A. increased vacuolation
- B. cell enlargement
- C. new cell wall deposition
- D. all of these

Answer: D



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9. Cells of which region are rich in protoplasm

A. elongation

B. meristematic

C. maturation

D. root hair region

Answer: B



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10. One single maize root apical meristem can give rise to more than

A. 17,500 new cells per min

B. 17,500 new cells per hour

C. 17,500 new cells per sec

D. 17,000 new cells per min

Answer: B



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11. Secondary growth of the plant is characterized by

A. increase in linear growth

B. increase in the girth

C. activity of vascular cambium and cork
cambium

D. Both (B) and (C)

Answer: B



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12. Growth of pollen tube is measured in term of its

A. radius

B. area

C. length

D. all of these

Answer: C



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13. In arithmetic growth of length of organ against time is plotted, the curve is

A. parabola

B. linear

C. sigmoid

D. rectangular

Answer: B



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14. In geometrical growth, initial growth is

A. zero

B. slow

C. very fast

D. linear

Answer: B



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15. Turgidity of cells helps in

- A. extension growth
- B. closing of stomata
- C. ripening of fruits
- D. diminising growth

Answer: A



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16. Sugarcane stores carbohydrate as sugar in

A. leaf

B. root

C. stem

D. fruits

Answer: C



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17. Malting process in brewing industry is speed up by the use of

A. GA_3

B. Auxin

C. ABA

D. Ethylene

Answer: A



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18. 2, 4-D is widely used to kill

A. Dicotyledonous weeds

B. Monocot weeds

C. Wheat

D. Paddy

Answer: A



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19. Bolting is promoted by use of

A. GA_3

B. ABA

C. ethylene

D. auxin

Answer: A



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20. Natural cytokinins are synthesized in regions of

- A. Slow cell division
- B. Rapid cell division
- C. Maturation
- D. Elongation

Answer: B



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21. A : Ethylene is a gaseous phytohormone.

R: It promotes ripening of many fruits.

A. A and R both are correct and R is correct explanation of A.

B. A and R are correct but R is not explanation of A.

C. A is correct and R is false.

D. A and R are false

Answer: B



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Objective Section Assertion Reasoning Type Questions

1. A : Plant usually bend towards the source of light.

R : Shoot apex shows positive phototropism because of differential growth caused due to unequal distribution of auxin.

A. A and R both are correct and R is correct explanation of A.

B. A and R are correct but R is not explanation of A.

C. A is correct and R is false.

D. A and R are false

Answer: A



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2. A: Cytokinin helps in retention of chlorophyll and delayed senescence in leaves.

R: Cytokinins only stimulate root initiation.

A. A and R both are correct and R is correct explanation of A.

B. A and R are correct but R is not explanation of A.

C. A is correct and R is false.

D. A and R are false

Answer: C



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3. A: ABA plays important role in plants during water stress and drought conditions.

R: Exogenously applied ABA promotes stomatal closing.

A. A and R both are correct and R is correct explanation of A.

B. A and R are correct but R is not explanation of A.

C. A is correct and R is false.

D. A and R are false

Answer: B



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4. A: When apical bud is removed, the next axial bud begins to grow out.

R : High concentration of auxin in the apical bud suppresses the growth of next axial bud.

A. A and R both are correct and R is correct explanation of A.

B. A and R are correct but R is not explanation of A.

C. A is correct and R is false.

D. A and R are false

Answer: A



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5. A: Senescence is induced by application of cytokinin in plant.

R: Cytokinin promotes the breakdown of chlorophyll, proteins and nucleic acids.

A. A and R both are correct and R is correct explanation of A.

B. A and R are correct but R is not explanation of A.

C. A is correct and R is false.

D. A and R are false

Answer: D



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Objective Section Analogy Type Questions

1. Initial growth : lag phase :: exponential growth :



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2. IAA : Indole complex :: ABA :



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3. Skoog and miller : cytokinin :: cousins : ...

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4. Cytokinin : Herring fish :: Gibberellins :
Gibberella fujikuroi (fungus) :

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5. Coconut milk : zeatin : ABA :

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6. Phenolic acids : seed dormancy :: low temperature :



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Objective Section Pick Up The Correct Option

1. Auxins promot/inhibit flowering in pineapples.



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2. GA_3 is used to speed up/slow down the malting process in brewing industry.

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3. Ethephon accelerates/slows down abscission in flowers and fruits of (cherry).

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4. The response of plants to periods of day and night is photoperiodism/vernalisation.



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5. Ripening of fruits/cell division promoting activity have been identified by cytokinin.



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Objective Section Fill In The Blanks

1. Gibberellins internodal elongation in plants with habit.

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2. ABA is hormone.

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3. IBA is acid.

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4. 3 different kinds of inhibitors and

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5. promotes rapid internode/petiole elongation in deep water rice plants.

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6. promotes female flowers in cucumbers.





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7. is widely applied in hedge making.



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