

# Plant Growth and Development — NEET Biology PYQ (2006-2021)

Class 11 Biology · 25 real NEET & AIPMT questions, year-tagged · answers checked by RankUp

NEET 2021

**1. Plants follow different pathways in response to environment or phases of life to form different kinds of structures. This ability is called :**

- (A) Elasticity
- (B) Flexibility
- (C) Plasticity
- (D) Maturity

NEET 2021

**2. The plant hormone used to destroy weeds in a field is :**

- (A) IAA
- (B) NAA
- (C) 2, 4-D
- (D) IBA

NEET 2020 · Q2

**3. The process of growth is maximum during:**

- (A) Log phase
- (B) Lag phase
- (C) Senescence
- (D) Dormancy

NEET 2020 · Q64

**4. Name the plant growth regulator which upon spraying on sugarcane crop, increases the length of stem, thus increasing the yield of sugarcane crop.**

- (A) Cytokinin
- (B) Gibberellin
- (C) Ethylene
- (D) Absciscic acid

NEET 2019 · Q167

**5. It takes very long time for pineapple plants to produce flowers. Which combination of hormones can be applied to artificially induce flowering in pineapple plants throughout the year to increase yield ?**

- (A) Auxin and Ethylene
- (B) Gibberellin and Cytokinin
- (C) Gibberellin and Absciscic acid
- (D) Cytokinin and Absciscic acid

NEET 2017 · Q88

**6. Fruit and leaf drop at early stages can be prevented by the application of:**

- (A) Cytokinins
- (B) Ethylene
- (C) Auxins
- (D) Gibberellic acid

NEET 2017 (Gujarati paper) · Q80

**7. Match Column-I with Column-II and select the correct option using codes given below.**

**Column-I: (a) Cytokinin (b) Ethylene (c) Gibberellin (d) Absciscic acid**

**Column-II: (i) stimulates closure of stomata (ii) increases stem length (iii) promotes lateral shoot growth (iv) found in large amount in tissues undergoing senescence**

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

NEET 2017 (Gujarati paper) · Q110

**8. Growth hormone Auxin was isolated by F.W. Went from tips of seedling coleoptile of:**

- (A) Maize
- (B) Wheat
- (C) Oat
- (D) Rice

NEET 2016 Phase 2 · Q110

**9. You are given a tissue with its potential for differentiation in an artificial culture. Which of the following pairs of hormones would you add to the medium to secure shoots as well as roots?**

- (A) IAA and gibberellin
- (B) Auxin and cytokinin
- (C) Auxin and abscisic acid
- (D) Gibberellin and abscisic acid

NEET 2016 Phase 1 · Q113

**10. The Avena curvature is used for bioassay of:**

- (A) ABA
- (B) GA<sub>3</sub>
- (C) IAA
- (D) Ethylene

AIPMT 2015

**11. Typical growth curve in plants is:**

- (A) Parabolic
- (B) Sigmoid
- (C) Linear
- (D) Stair-steps shaped

AIPMT 2015

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

- (A) Auxin accumulates on the shaded side, stimulating greater cell elongation there
- (B) Green plants need light to perform photosynthesis
- (C) Green plants seek light because they are phototropic
- (D) Light stimulates plant cells on the lighted side to grow faster

AIPMT 2014

**13. Which one of the following growth regulators is known as 'stress hormone'?**

- (A) Ethylene
- (B) GA<sub>3</sub>
- (C) Indole acetic acid
- (D) Abscissic acid

AIPMT 2014

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

- (A) It is the basis for quantitative determination of small amounts of growth-promoting substances
- (B) It supports the hypothesis that IAA is auxin
- (C) It demonstrated polar movement of auxins
- (D) It made possible the isolation and exact identification of auxin

NEET 2013

**15. During seed germination its stored food is mobilized by**

- (A) Ethylene
- (B) Cytokinin
- (C) ABA
- (D) Gibberellin

AIPMT 2012 Mains

**16. Which one of the following generally acts as an antagonist to gibberellins ?**

- (A) Zeatin
- (B) Ethylene
- (C) ABA
- (D) IAA

AIPMT 2010 Mains · Q29

**17. One of the commonly used plant growth hormone in tea plantations is**

- (A) Ethylene
- (B) Absciscic acid
- (C) Zeatin
- (D) Indole - 3 - acetic acid

AIPMT 2010 Prelims · Q162

**18. Phototropic curvature is the result of uneven distribution of**

- (A) Auxin
- (B) Gibberellin
- (C) Phytochrome
- (D) Cytokinins

AIPMT 2009 Prelims · Q71

**19. One of the synthetic auxin is:**

- (A) IAA
- (B) GA
- (C) IBA
- (D) NAA

AIPMT 2009 Prelims · Q144

**20. Which one of the following acids is a derivative of carotenoids?**

- (A) Indole-3-acetic acid
- (B) Gibberellic acid
- (C) Absciscic acid
- (D) Indole butyric acid

AIPMT 2007 Prelims · Q200

**21. "Foolish seedling" disease of rice led to the discovery of**

- (A) ABA
- (B) 2, 4-D
- (C) IAA
- (D) GA

**22. Parthenocarpic tomato fruits can be produced by :**

- (A) removing androecium of flowers before pollen grains are released
- (B) treating the plants with low concentrations of gibberellic acid and auxins
- (C) raising the plants from vernalized seeds
- (D) treating the plants with phenylmercuric acetate

**23. How does pruning help in making the hedge dense ?**

- (A) It induces the differentiation of new shoots from the rootstock
- (B) It frees axillary buds from apical dominance
- (C) The apical shoot grows faster after pruning
- (D) It releases wound hormones

**24. Farmers in a particular region were concerned that pre-mature yellowing of leaves of a pulse crop might cause decrease in the yield. Which treatment could be most beneficial to obtain maximum seed yield ?**

- (A) Frequent irrigation of the crop
- (B) Treatment of the plants with cytokinins along with a small dose of nitrogenous fertilizer
- (C) Removal of all yellow leaves and spraying the remaining green leaves with 2, 4, 5-trichlorophenoxy acetic acid
- (D) Application of iron and magnesium to promote synthesis of chlorophyll

**25. An enzyme that can stimulate germination of barley seeds is :**

- (A)  $\alpha$ -amylase
- (B) lipase
- (C) protease
- (D) invertase

## Answer key and explanations

**1. Answer: (C) Plasticity**

The ability of plants to follow different developmental pathways in response to environment or phase of life, as in heterophylly of cotton or buttercup, is called plasticity. Flexibility and elasticity are not the botanical terms used for this.

**2. Answer: (C) 2, 4-D**

2,4-D is a synthetic auxin widely used as a herbicide to kill broad-leaved dicot weeds, leaving monocot crops unharmed. IAA and IBA are natural auxins and NAA is used mainly for rooting and preventing fruit drop.

**3. Answer: (A) Log phase**

In the sigmoid growth curve the log (exponential) phase shows the fastest growth because all the cells keep dividing. Growth is slow in the lag phase, slows and stops at senescence, and is suspended during dormancy.

**4. Answer: (B) Gibberellin**

Spraying gibberellins on sugarcane elongates the stem internodes, raising the yield by as much as 20 tonnes per acre. Cytokinins promote cell division, ethylene ripening and senescence, and ABA dormancy, so none of them lengthens the stem.

**5. Answer: (A) Auxin and Ethylene**

Auxins (such as NAA) induce flowering in pineapple, and ethylene also promotes synchronised flowering in pineapple. Abscissic acid is a growth inhibitor and would not promote flowering.

**6. Answer: (C) Auxins**

Auxins such as NAA prevent premature drop of fruits and leaves, while they promote abscission of older mature leaves and fruits. Ethylene does the opposite and promotes abscission.

**7. Answer: (D) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)**

Cytokinins overcome apical dominance and promote lateral shoot growth; ethylene is produced in large amounts by senescing tissues and ripening fruits; gibberellins cause stem elongation; abscisic acid stimulates stomatal closure. The trap code giving ethylene the stem-elongation role confuses it with gibberellin.

**8. Answer: (C) Oat**

F.W. Went isolated auxin from the coleoptile tips of oat (*Avena sativa*) seedlings using agar blocks. Maize, wheat and rice coleoptiles were not used in his classic experiment.

**9. Answer: (B) Auxin and cytokinin**

In tissue culture the auxin to cytokinin ratio controls organ formation: a higher auxin ratio favours roots and a higher cytokinin ratio favours shoots, so both are needed to obtain shoots and roots. Gibberellin and abscisic acid do not drive this organ differentiation.

**10. Answer: (C) IAA**

In the *Avena* curvature test, an agar block containing auxin placed on one side of a decapitated oat coleoptile causes bending proportional to auxin concentration, so it is the bioassay for IAA. Gibberellins are assayed by dwarf pea/maize or barley endosperm tests instead.

**11. Answer: (B) Sigmoid**

Plant growth passes through a slow lag phase, a fast exponential (log) phase and a stationary phase, giving an S-shaped or sigmoid curve when plotted against time.

**12. Answer: (A) Auxin accumulates on the shaded side, stimulating greater cell elongation there**

Auxin moves away from light to the shaded side, where it makes cells elongate more, so the shoot bends toward the light. The lighted side grows less, not faster, and 'seeking light' only names the response without explaining it.

**13. Answer: (D) Abscissic acid**

Abscissic acid increases plant tolerance to stresses such as drought, for example by closing stomata, so it is called the stress hormone. Ethylene is a ripening/senescence hormone, and GA<sub>3</sub> and IAA are growth promoters.

**14. Answer: (A) It is the basis for quantitative determination of small amounts of growth-promoting substances**

Went's *Avena* curvature test showed that a diffusible substance collected in agar from coleoptile tips causes bending in proportion to its amount, so it became a bioassay for quantitative estimation of small amounts of auxin. It did not identify the substance chemically as IAA or demonstrate polar transport.

**15. Answer: (D) Gibberellin**

In germinating cereal grains, gibberellin from the embryo induces the aleurone layer to make hydrolytic enzymes such as  $\alpha$ -amylase, which mobilise stored starch. ABA has the opposite effect and promotes dormancy.

**16. Answer: (C) ABA**

ABA promotes dormancy and inhibits growth, so it generally opposes gibberellins, which break dormancy and promote germination and elongation. Zeatin (a cytokinin) and IAA (an auxin) are growth promoters.

**17. Answer: (D) Indole - 3 - acetic acid**

Auxins such as IAA are used in tea plantations, where shoot tips are removed to break auxin-driven apical dominance and get bushy growth, and auxins are applied to make stem cuttings root for propagation. Ethylene and ABA are not used commercially there in this way.

**18. Answer: (A) Auxin**

Under one-sided light, auxin builds up on the shaded side of the shoot tip, and those cells elongate more, so the shoot bends towards the light. This was shown in the coleoptile experiments of Darwin and Went. Phytochrome is a light-sensing pigment linked to flowering and germination, not the growth hormone that causes the curvature.

**19. Answer: (D) NAA**

NCERT states that IAA and IBA have been isolated from plants, whereas NAA (naphthalene acetic acid) and 2,4-D are synthetic auxins. GA is a gibberellin, not an auxin.

**20. Answer: (C) Abscissic acid**

Abscissic acid is a sesquiterpene formed from the breakdown of carotenoids (xanthoxin pathway). IAA and IBA are indole compounds derived from tryptophan, and gibberellic acid is a diterpene not derived from carotenoids.

**21. Answer: (D) GA**

Kurosawa found that rice seedlings infected by the fungus *Gibberella fujikuroi* grew abnormally tall (bakanae or foolish seedling disease) because of a substance later named gibberellin (GA). IAA was discovered from oat coleoptile experiments and ABA from studies of abscission and dormancy.

**22. Answer: (B) treating the plants with low concentrations of gibberellic acid and auxins**

Auxins and gibberellins can make the ovary grow into a fruit without fertilisation, giving seedless (parthenocarpic) tomatoes. Removing the androecium alone only stops pollination; without a hormone stimulus the flower would simply drop.

**23. Answer: (B) It frees axillary buds from apical dominance**

The shoot apex makes auxin that suppresses the lateral buds (apical dominance). Pruning removes the apex, so axillary buds grow into branches and the hedge becomes bushy. The apical shoot does not grow faster; it is the part that is removed.

**24. Answer: (B) Treatment of the plants with cytokinins along with a small dose of nitrogenous fertilizer**

Cytokinins delay leaf senescence by keeping chlorophyll and protein from breaking down, and a small dose of nitrogen supports this, so leaves stay green and photosynthesise longer for seed filling. Iron and magnesium help chlorophyll synthesis but do not stop natural senescence-type yellowing.

**25. Answer: (A)  $\alpha$ -amylase**

Gibberellin from the embryo makes the aleurone layer produce  $\alpha$ -amylase, which breaks starch into sugars for the growing seedling. This is the basis of using GA in malting barley.

Questions as set in the AIPMT/NEET papers conducted by CBSE and NTA. Answers checked and explanations written by the RankUp team. RankUp is not affiliated with CBSE or NTA.