Unit 5 · Plant Hormones

WORKSHEET

Full marks 32

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 32

1 Key words [4.5]

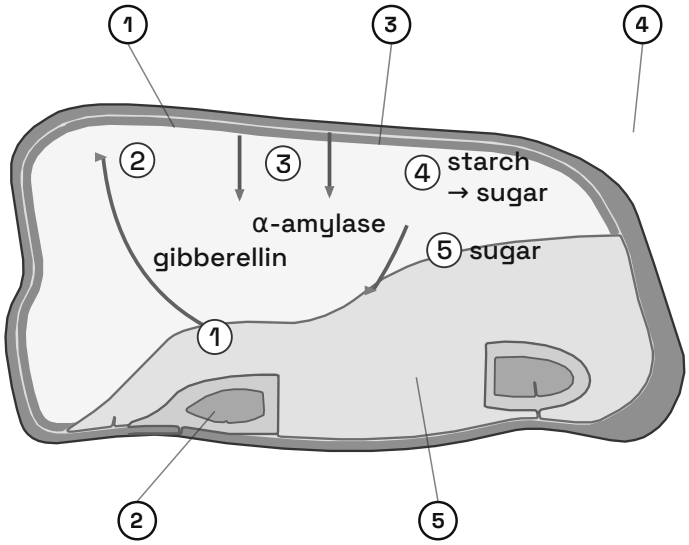
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

abscisic acid	**adenine**	**bakanae**	**bolting**	**ethylene**	**florigen**	**IAA**	**parthenocarpic**
phytochrome	**polar**	**Richmond–Lang**					

The word phytohormone was proposed by Kenneth Thimann in 1948. The main natural auxin in every plant is _____, made from the amino acid tryptophan. Auxin moves down a stem from the tip towards the base, which is called _____ transport. Fruits that form without fertilization, and so have no seeds, are _____. Gibberellins were first found in the fungus *Gibberella fujikuroi*, which causes the _____ disease of rice. The sudden shooting up of a rosette plant's stem before it flowers is _____. Cytokinins are derivatives of the purine _____. The keeping green of a detached leaf treated with kinetin is the _____ effect. A gas that ripens fruits is _____, and the hormone that closes the stomata when water runs short is _____.

2 Label the diagram [2.5]

The diagram shows a germinating cereal grain cut lengthwise. Write the names of the parts numbered 1 to 5 outside the grain. (The small numbers inside it are the steps of germination.) Each carries 0.5 mark.



1. _____ 2. _____

3. _____ 4. _____

5. _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. Which of the following plant parts generally contains the highest concentration of gibberellins? [1]

a. roots
b. mature leaves
c. immature seeds
d. stem bark

ii. Why is ethylene an awkward fit for the classical definition of a hormone? [1]

a. it is made only by fungi, not by plants
b. it is a gas and acts mostly at or near the place where it is made, not at a distant site
c. it is needed in large amounts
d. it is a synthetic compound

iii. In Went's test, a decapitated coleoptile bends away from the side on which the agar block sits. Why? [1]

a. the agar block is heavy and pushes it over
b. auxin from the block makes the cells on that side grow longer than those on the other side
c. auxin from the block kills the cells on that side
d. light falls on the side away from the block

iv. A dwarf pea plant grows to normal height when sprayed with gibberellin. What does this tell you about why it was a dwarf? [1]

a. it couldn't make auxin
b. it couldn't make enough gibberellin
c. its cells couldn't respond to gibberellin
d. it lacked cytokinin in its roots

v. Apical dominance is strong and the lateral buds are suppressed. Which combination of hormones would best promote lateral bud growth? [1]

a. high auxin, low cytokinin
b. low auxin, high cytokinin
c. high gibberellin, low auxin
d. high ethylene, low cytokinin

4 Short answers [9]

Write short answers to the following questions.

a. Define plant growth regulators. Name two synthetic ones. [2]

b. Why does 2,4-D sprayed on a wheat field kill the weeds but not the wheat? [2]

c. A farmer wants a field of pineapple to flower and fruit all at once, and a nursery wants rose cuttings to root quickly. Which hormone would each use, and how? **[2]**

d. What is apical dominance? How do auxin and cytokinin together decide whether a lateral bud grows? **[3]**

5 Long answers **[8]**

Write long answers to the following questions.

a. Describe Went's Avena curvature test. What did it show? **[4]**

b. Write any four physiological effects of gibberellins. **[4]**

6 Think [3]

A lab has a lump of tobacco callus and wants a hundred small plants from it, each with shoots and roots. Plan the media it should use, in order, and explain each step.

7 Activity: Rooting cuttings (not marked)

Take six stem cuttings about 15 cm long from one plant (rose, hibiscus, tulsi or marigold), strip the lower leaves and cut each base just below a node. Dip three bases in a rooting powder of IBA or NAA; leave three untreated. Plant each set in moist sand, keep them shaded, and pull one of each gently after two and three weeks.

Cuttings	Roots after two weeks	Roots after three weeks
dipped in rooting powder		
untreated		

From which end of each cutting did the roots grow, and why?