Chapter 11

Put line under your answer! There is only one correct answer in the multiple choice questions

1. Which of the following apparently affects stems more than it does roots?
   a) cytokinin
   b) ethylene
   c) abscisic acid
   d) gibberellins
   e) auxin

2. Which of the following is used by nurseries to cause active plants to become dormant?
   a) cytokinin
   b) ethylene
   c) abscisic acid
   d) gibberellins
   e) auxin

3. Which of the following plant movements is due to primarily to an external stimulus?
   a) helical (spiraling) movement
   b) nodding movement
   c) twining movement
   d) gravitropism
   e) None of these answers are correct

4. Plants that have two critical photoperiods are called
   a) short-day plants
   b) long-day plants
   c) day-neutral plants
   d) critical-day plants
   e) intermediate-day plants

5. The suppression of the growth of axillary or lateral buds is called
   a) metabolic inhibition
   b) dioxin toxic syndrome
c) recessive meristem induction
d) cytokinin- gibberellin negation
e) apical dominance

6. **The plant physiologist credited with the discovery of auxins was**
   
a) Frits Went
b) Charles Darwin
c) Francis Darwin
d) R.F.M. van Steveninck
e) P.F. Wareing

7. **Which of the following play a major role in water-conservation movements of grasses?**
   
a) bulliform cells
b) epidermal cells
c) mesophyll cells
d) glands
e) fibers

8. **Which of the following groups of plants tends to be the least sensitive to auxins?**
   
a) herbaceous dicots
b) monocots
c) woody dicots
d) flowering plants with net-veined leaves
e) plants with flower parts in multiples of 4 or 5

9. **Which of the following is a phenylacetic acid (PAA)?**
   
a) a gibberellin
b) an auxin
c) a cytokinin
d) an ethylene derivative
e) None of these answers are correct

10. **The defoliant Agent Orange was a 1-to-1 mixture of 2,4-D and**
    
a) TCDD
b) 2,4,5-T
c) DDT
d) TCP
e) 2,4,6-Z

11. **Which of the following functions as a precursor in the synthesis of gibberellins?**
    
a) Vitamin A
b) cytokinin
c) Vitamin D
d) Acetyl CoA
e) starch

12. Which of the following is apparently synthesized from carotenoid pigments in plastids?
   a) abscisic acid
   b) gibberellins
   c) ethylene
   d) auxins
   e) cytokinins

13. Which of the following promote(s) senescence in plant parts?
   a) abscisic acid
   b) auxins
   c) ethylene
   d) None of these answers are correct
   e) More than one of these answers are correct

14. Which of the following is an effect of light on auxin?
   a) It develops into a more complex substance
   b) It disintegrates completely
   c) It migrates away from the light against a diffusion gradient
   d) It is increased in quantity
   e) It produces a stronger response

15. A precursor is
   a) a traveling electron
   b) a growth-regulating substance
   c) a simple molecule that is converted by living organism to a more complex molecule
   d) a gene that determines writing style
   e) one who is predisposed to using profanity

16. As living individuals grow and reproduce their response to environmental stimuli may include
   A. movement
   B. increase in size
   C. change in position
   **D. all of these**
   E. none of these

17. The plant hormone that is an "anti-transpirant" is:
   a. abscisic acid
18. Nastic movements
   a. depend on the direction of the stimulus.
   b. are independent of the direction of the stimulus.
   c. either a or b.
19. Gibberellins
   a. are growth promoters.
   b. bring about elongation of cells.
   c. both a and b.
20. Cytokinins
   a. promote cell division.
   b. prevent senescence.
   c. initiate growth.
   d. all of the above.
21. Phytochromes are involved in
   a. seed germination.
   b. stem growth.
   c. flowering.
   d. all of the above.
22. Which of the following are events of the Calvin cycle?
   a. carbon-dioxide fixation
   b. carbon-dioxide reduction
   c. regeneration of RuBP
   d. all of the above
23. The six-carbon molecule resulting from carbon-dioxide fixation immediately breaks down to form __________.
   a. two PGA three-carbon molecules
   b. three PGA two-carbon molecules
   c. neither a or b
24. In a C4 plant, the __________ cells contain chloroplasts.
   a. bundle sheath
   b. mesophyll
   c. both a and b
25. During the energy-capturing reactions of photosynthesis, which of the following occurs?
   a. light-dependent reactions
   b. light-independent reactions
   c. both a and b

b. gibberellin
c. indole acetic acid
d. ethylene
e. cytokinin
b. light-independent reactions
c. both a and b

26. ATP production during photosynthesis is sometimes called photophosphorylation because _________.
   a. light is involved
   b. water is involved
   c. oxygen is involved
   d. all of the above

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Put (True) or (False) with each following sentences.

27. Phototropic responses may vary according to light intensity (        ).
28. Grass leaves may roll up in dry weather when certain cells lose their turgor (        ).
29. Apical dominance can be offset with an application of cytokinins to axillary buds (        ).
30. Day-neutral plants do not need light in order to flower (        ).
31. Tissue culture involves the cultivation of cells on a tree branch (        ).
32. Phytochrome pigment is known to occur in at least three stable forms (        ).
33. Garner and Allard were responsible for coining the term photoperiodism (        ).
34. Both photosynthesis and cellular respiration make use of an electron carrier and an electron transport system (        ).

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1. Auxin stimulates the growth of root cells. (true)
2. Auxin stimulates the growth of stem cells. (false)
3. Apically-produced auxin stimulates the growth of axial buds (false).

Matching: Write in meddle column the number for the best answer.

<table>
<thead>
<tr>
<th>1. Growth</th>
<th>10</th>
<th>is synthesized in plastids, apparently from carotenoid pigments.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Development</td>
<td>9</td>
<td>is vital to the process of respiration, functions as a precursor in the synthesis of GA.</td>
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<tr>
<td>3. Hormones</td>
<td>8</td>
<td>stimulate the formation of roots on almost any plant organ.</td>
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<tr>
<td>4. Darwin</td>
<td>7</td>
<td>stimulate the enlargement of cells.</td>
</tr>
<tr>
<td>5. Went</td>
<td>6</td>
<td>measured the angle of curvature.</td>
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<tr>
<td>Number</td>
<td>Term</td>
<td>Page</td>
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<tr>
<td>6</td>
<td>Bioassay for auxin</td>
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<tr>
<td>7</td>
<td>Auxins</td>
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<td>IAA or auxin</td>
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<tr>
<td>9</td>
<td>Acetyl coenzyme A</td>
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<tr>
<td>10</td>
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<td>11</td>
<td>Gibberellins</td>
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<tr>
<td>12</td>
<td>Cytokinins</td>
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<td>Abscisic acid</td>
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<td>14</td>
<td>Ethylene gas</td>
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<td>15</td>
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<td>16</td>
<td>Plant movements</td>
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<td>18</td>
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<tr>
<td>19</td>
<td>Apical dominance</td>
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<td>20</td>
<td>Removal of the terminal bud</td>
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<tr>
<td>21</td>
<td>Gibberellins</td>
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<td>22</td>
<td>Ethylene</td>
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<td>23</td>
<td>Bulliform cells</td>
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<td>Turgor movements</td>
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<td>25</td>
<td>Photoperiodism</td>
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<td>26</td>
<td>Short-day plants</td>
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<td>27</td>
<td>Long-day plants</td>
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<td>28</td>
<td>Intermediate-day plants</td>
<td>23</td>
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<tr>
<td>29</td>
<td>Day-neutral plants</td>
<td>22</td>
</tr>
</tbody>
</table>
For each of the following, indicate the appropriate hormone (auxin, gibberellin, ABA, cytokinin, ethylene). There may be more than one correct answer for some questions.

1. ______ amounts that stimulate shoot growth inhibits roots
2. ______ delays senescence
3. ______ active in phototropism and gravitropism
4. ______ involved in leaf abscission
5. ______ promotes fruit ripening
6. ______ promotes senescence
7. ______ maintains dormancy
8. ______ stimulate root initiation
9. ______ 2,4-D is a synthetic version
10. ______ affects sex expression in plants
11. ______ sesquiterpene
12. ______ stimulates seed germination
13. ______ reverses dwarfing in some plants
14. ______ methionine is the amino acid precursor
15. ______ napthalene acetic acid has similar activity
16. ______ often antagonistic to effects of ABA
17. ______ parthenocarpic fruit development
18. ______ promotes stem elongation in intact plants
19. ______ involved in apical dominance

<table>
<thead>
<tr>
<th>30. Positive phototropism</th>
<th>21</th>
<th>Led to grow tall plants and flowering.</th>
</tr>
</thead>
<tbody>
<tr>
<td>31. No flowers</td>
<td>39</td>
<td>is a state in which a seed is unable to germinate unless appropriate environmental conditions exist.</td>
</tr>
<tr>
<td>32. Phytochromes</td>
<td>38</td>
<td>is a period of growth inactivity in seeds, buds, bulbs, and other plant organs.</td>
</tr>
<tr>
<td>33. Day light</td>
<td>37</td>
<td>shoots forming the main axis of plants.</td>
</tr>
<tr>
<td>34. In the dark</td>
<td>36</td>
<td>primary roots of plants.</td>
</tr>
<tr>
<td>35. Gravitropisms</td>
<td>35</td>
<td>growth responses to the stimulus of gravity.</td>
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<tr>
<td>36. Positively gravitropic</td>
<td>34</td>
<td>Pfr will convert back to Pr.</td>
</tr>
<tr>
<td>37. Negatively gravitropic</td>
<td>33</td>
<td>generally results in more Pr being converted to Pfr (the active form) than vice versa.</td>
</tr>
<tr>
<td>38. Dormancy</td>
<td>32</td>
<td>occur in two forms, each of which can be converted to the other by the absorption of light.</td>
</tr>
<tr>
<td>39. Quiescence</td>
<td>31</td>
<td>when the short-day plant exposed to long days.</td>
</tr>
</tbody>
</table>
20. ______ breaks dormancy in seeds and buds
21. ______ biosynthesized from tryptophan
22. ______ causes loosening of the cell wall
23. ______ diterpene
24. ______ closes stomata
25. ______ controls morphogenesis of plant tissue cultures
26. ______ derived from carotenes (tetraterpenes)