

# 國立中央大學八十九學年度碩士班研究生入學試題卷

66 所別: 生命科學系 不分組 科目: 植物生理學 共 2 頁 第 1 頁

請使用學校所提供之試紙作答，並註明題號，不得使用其他紙張作答

I. Match the following terms with the description below [Caution & note: 2 points each for a correctly answer, but 3 points will be subtracted for each of wrong match!] (20 points in total)

- |                         |               |                      |                      |                        |                |
|-------------------------|---------------|----------------------|----------------------|------------------------|----------------|
| A. Abscission           | B. Adsorption | C. Absorption        | D. Brownian movement | E. Cohesion theory     | F. Elasticity  |
| G. Exudation            | H. Florigen   | I. Fluorescence      | J. Hill reaction     | K. Hypotonic solutions |                |
| L. Hypertonic solutions |               | M. Osmotic pressures |                      | N. plasmolysis         | O. plasmalemma |
| P. Root pressures       |               | Q. Vernalization     |                      | R. Tuberization        | S. Evaporation |
| T. Transpiration        |               | U. Translocation     |                      |                        |                |

- ( ) 1. A theory of upward moving of water molecular through the xylem ducts.
- ( ) 2. having a higher osmotic pressure than that of another fluid
- ( ) 3. Movement of small particles such as pollen grains, bacteria etc, when suspended in a colloidal solution
- ( ) 4. the exposure of certain plants or their seeds to a period of cold which is necessary to cause them to flower.
- ( ) 5. The separation of a part from the rest of the plant.
- ( ) 6. The discharge of material from a cell, organ through a membrane
- ( ) 7. The adhesion of molecules to a face
- ( ) 8. Movement or removal to a different place or habitat
- ( ) 9. the withdrawal of water from a plant cell by osmosis if placed in a strong salt.
- ( ) 10. the minimum pressure that must be exerted to prevent the passage of pure solvent into the solution

II. Multiple choice (2.5 points each, <sup>62.5</sup> points in total)

- The principal high energy bond in metabolism is the (a). oxygen bond. (b). hydrogen bond (c). phosphate bond. (d). carbon linkage bond (e). ionic bond
- Catabolism is: (a). all metabolic processes in the body (b) building-up processes. (c). light reactions (d). breaking-down processes (e). none of the above
- Chlorophyll is: (a). found in chloroplasts. (b). green to our eyes. (c). a pigment. (d). able to pass on the accept electrons. (e). all of these.
- One difference between cyclic and noncyclic photophosphorylation is: (a). ATP is produced by one but not the other. (b). only one involves chlorophyll. (c). noncyclic requires a continual supply of electrons. (d). cytochrome oxidase is utilized in cyclic but not noncyclic.
- What is the function cyclic photophosphorylation? (a). It produces the NADPH<sub>2</sub> (b). It produces ATP (c). It produces chlorophyll. (d). It causes disease in plants. (e). It produces light
- The following reaction of  $\text{Cu}^{++} + \text{e}^{-} \longrightarrow \text{Cu}^{+}$  is (a). an oxidation (b). a reduction (c). electron transport reaction
- During photosynthesis, oxygen is derived from: (a). carbon dioxide. (b). light (c). water. (d). chlorophyll (e). cytochrome
- Transpiration is (a). plant equivalent of gas exchange. (b). conduction of dissolved materials in plants. (c). loss of water by evaporation from leaves. (d). conduction of water by root pressure (e) cross section of tissues
- When stems are exposed to light from one side, they respond by growing toward the light. This is due to: (a) a uniform distribution of auxin. (b). an unequal amount of auxin with more one the illuminated side. (c). an unequal amount of auxin with more on the shady side. (d). a downward shift of auxin to ground level. (e) all of these

參考用

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10. If you wanted a short-day plant to flower, you would: (a). be sure to shine a light on it in winter only. (b). keep the plant in the dark for longer than in the light. (c). be sure to interrupt the dark with frequent flashes of light. (d). keep the plant in the dark for shorter than in the light
11. Which of these correctly explains the movement of auxin? (a). by nervous transmission (b). by diffusion from the area of production to another area. (c). by turgor pressure.. (d). by etiolation.
12. Oriented growth of a plant in response to gravity is called: (a) orientation (b) phototropism (c) thigmotropism (d) gravitation (e) geotropism
13. If you cut off the tip of an oat seedling and thus remove the coleoptile tip, the oat seedling will no longer respond to light because the tip (a) produce contains chlorophyll. (b). produces IAA (c). physically bends the seedling. (d). produces sugars. (e) likes to grow in the dark environment
14. Plants have a biological clock called phytochrome that measures (a). the amount of a hormone present. (b). the length of a period of dark. (c). the minutes of the day (d). the height of the plant
15. The push-pull theory of water transport emphasizes the following two processes: (a). root pressure and transpiration (b). xylem and phloem. (c). Osmotic pressure and starch storage. (d). vascular tissue and lenticels. (e). all of these.
16. The alpha 1,4 glucoside linkage group is found in (a). starch (b). cellulose, (c). glycogen (d). a and c of the above (e). all of the above
17. The molecule that is least related to porphyrin structure is (a). cytochrome (b). chlorophyll (c). hemoglobin (d). ribonuclease (e) a and b of the above.
18. The tertiary structure of protein is principally due to (a). peptide linkage (b). hydrogen bonds (c). phosphate esters (d). disulfide bridge (e). additional polypeptides
19. In glycolysis, fructose-1,6-diphosphate splits to form (a). glucose phosphate (b) two PGAL molecules (c). ribulose diphosphate (d) lactic acid and alcohol (e). none of the above
20. The enzymes necessary for the Krebs cycle are located in the (a). mitochondria (b) ribosome (c). cytoplasm (d) Golgi apparatus (e). nucleus (f). lysosome
21. When the light-reaction and carbon-fixation process has been completed, the end of photosynthesis is indicated by the formation of (a) CO<sub>2</sub> (b). PGAL (c). ATP (d). starch (e). glucose
22. The number of ATP molecules formed in the complete oxidation of one molecule of glucose is (a). 12 (b). 18 (c). 24 (d). 36 (e). 48
23. Control of the growth of developing roots and stems is believed to be due to (a). sun-light (b). soil temperature (c). auxins (d). moisture (e). b and c of the above
24. Photoperiodism (a) is the effect of varying light periods upon flowering (b) is produced by the phytochrome system (c). perhaps involves florigen (d). a and c of the above (e) a, b, and c of the above
25. The process of aging and senescence may be caused by (a). loss of cellular functions (b). programmed genetic senescence (c) uncontrolled lysosome action (d). a and b of the above (e). all of the above

參考用

## II. Short Answer of the following questions (7.5 points in total)

26. What distinction, if any, would you make between enzymes, hormones, and vitamins? (5.5 points)
27. How would you determine whether the "diseased" condition of a plant was the result of a mineral element deficiency or was caused by some pathogenic organisms? (4 points)
28. When fruits ripen, what chemical changes occur in the cell walls? (4 points)
29. The climate at certain altitudes on high mountains in tropical regions is similar in most respects to that of temperate regions. Plants transplanted from such mountain habitats to temperate regions often fail to grow and bloom. Explain (4 points)