PART II

Registration No.....

Multiple choice questions

Underline the most appropriate answer..

1. A membrane separates water on one side and 1M KCl on the other side.

   a) If only K^+ is permeable, concentration of K^+ will be equal on both sides, while Cl^- will only be on one side.
   b) If both k^+ and Cl^- are permeable, they will remain on one side of the membrane.
   c) If only K^+ is permeable, almost all of it will move to the other side of the membrane.
   d) If only K^+ is permeable, some of it will move to the other side but the charge difference across the membrane will cause the rest to remain on the same side as Cl^-.

2. Select the correct order of physical processes by which water passes through a green plant from soil water to air.

   a) capillarity – osmosis – diffusion - osmosis.
   b) osmosis – capillarity – evaporation – diffusion.
   c) diffusion – evaporation – capillarity – osmosis.
   d) evaporation - diffusion – osmosis – capillarity.

3. Soil water that is available to plants is

   a) hygroscopic water and gravitational water
   b) Gravitational water and capillary water
   c) Capillary water and [illegible] water.

4. The bonding between hydrogen atoms and the oxygen atom in a molecule of water is best described as

   a) ionic bonding
   b) non polar, covalent bonding
   c) polar, covalent bonding
   d) hydrogen bonding.

5. Which of the following is the major lipid component of most biological membranes?

a) fats
b) phospholipids
c) cholesterol plus steroids
d) carbohydrates.

6. When a plant cell is plasmolyzed, the space between the plasma membrane and the cell wall is occupied by

a) the plasmolyzing solution
b) water
c) air
d) the original vacuolar material

7. Plants require many minerals in large quantities. Three minerals, which are most rapidly removed from soil are present in most commercial fertilizers. These are

a) potassium, iron, sulphur
b) potassium, nitrogen, phosphorous
c) nitrogen, phosphorous, sulphur
d) potassium, calcium, nitrogen

8. A plant is growing in a soil where the concentration of a certain element is 50 ppm. This nutrient is found in a concentration of 200 ppm in the tissues of the plant root. The nutrient is taken up rapidly. The mechanism by which this nutrient is entering the tissue is probably

a) diffusion
b) active transport
c) osmosis
d) bulk transport

9. Field capacity is
a) the same as permanent wilting point
b) the amount of water in soil available to plants
c) the amount of water in soil after drainage takes place
d) higher for sandy soils than clay soils.

10. Transpiration of plants require all of the following except

a) cohesion between water molecules
b) evaporation of water molecules
c) active transport of water molecules
d) transport through xylem cells

11. In plants continuity of the symplast is achieved by
    a) plasmodesmata
    b) intercellular spaces
    c) the middle lamellae between adjacent cell walls
    d) cohesion of water molecules

12. Root cells are, by comparison with "soil water," generally
    a) isotonic
    b) hypertonic
    c) hypotonic
    d) variant between hypotonic and hypertonic extremes

13. If a plant cell with a water potential of -1.0 MPa is placed in a beaker containing a sucrose solution that has a water potential of -4.0 Mpa,

    i) The plant cell will become
        a) larger
        b) smaller
        c) not change
    ii) The weight of the plant cell will
        a) increase
        b) decrease
        c) not change
    iii) The concentration of the sucrose solution in the beaker will
        a) increase
        b) decrease
        c) not change
    iv) The turgidity of the plant cell will
        a. increase
        b. decrease
        c. not change
    v) There will be a net movement of water from the:
        a. cell to the solution
        b. solution to the cell

14. In the cohesion theory of ascent of sap, cohesion is involved in
    a) maintaining continuous vertical columns of the transported solution
    b) pushing the columns of solution up the stem
    c) keeping solutes in transported solution
    d) accumulating solutes in the root cells

15. Which of the following will not cause stomata to open?
    a) internal clock
    b) light
    c) high carbon dioxide concentration
    d) movement of K+

16. We know that large trees can be killed by girdling (removal of a ring of bark) them. The main reason for death of girdled trees is that
    a) transport of water from the roots to the aerial parts of the shoot is seriously disrupted.
    b) transport of inorganic ions from the roots to the shoot is seriously disrupted.
    c) transport of organic nutrients within the plant body is seriously disrupted.
    d) the tender inner tissues of the stem are exposed to infection.

17. Which of the following is not the correct pairing of structure with function?
    a) Golgi complex : breakdown of complex molecules
    b) Mitochondrion : production of ATP
    c) Endoplastic reticulum : synthesis of proteins
    d) Chloroplast : photosynthesis

18. Small clay particles hold calcium, potassium and magnesium ions because their surfaces are
    a) smooth
    b) negatively charged
    c) positively charged
    d) covered with tiny crevices

19. A certain protein molecule consists of four sub-units, each is polypeptide chain with an alpha helix Considering this information, which structural levels of organization must the molecule have?
    a) primary structure
    b) primary and secondary structure
    c) primary, secondary and tertiary structure
    d) primary, secondary, tertiary and quaternary structure

20. Arrange the following five events in an order that explains the mass flow of materials in the phloem.
    1. Water diffuses into the sieve elements.
    2. Leaf cells produce sugar by photosynthesis.
    3. Solutes are actively transported into sieve elements.
    4. Sugar is transported from cell to cell in the leaf.
    5. Sugar moves down the stem.

    a. 2, 1, 4, 3, 5
    b. 1, 2, 3, 4, 5
    c. 2, 4, 3, 1, 5
    d. 4, 2, 1, 3, 5
    e. 2, 4, 1, 3, 5