University of Ruhuna – Faculty of Technology

Bachelor of Biosystems Technology Degree
Level I (Semester I) Examination
November 2019
Course Unit: BST 1142 – Plant Physiology (Theory)

Index No: .....

INSTRUCTIONS: Please read the instructions carefully before answering the paper.
Number of pages: Five (5)
Time: Two hours (2 hours)
Please ensure that you have written your **index number** in the space provided above.
There are 03 parts. **Answer all questions in part 1 & 2. Answer only three (03) questions in part 3.**

Part 1 – MCQ – Answer all questions. (10 minutes)

1. When a molecule enters a cell via the proteins on its membrane, it has undergone:

   A. Adhesion
   B. Osmosis
   C. Cohesion
   D. Facilitated diffusion

2. The process of taking materials into the cell by means of unfolding, or pockets, of the cell membrane, is not called:

   A. Endocytosis
   B. Phagocytosis
   C. Cell eating
   D. Exocytosis

3. Rate of transpiration is increased with increase in .....

   A. light
   B. temperature
   C. wind
   D. All of Above

4. Transpiration is done 90% by process of .....

   A. cuticular transpiration
   B. lenticular transpiration
   C. stomatal transpiration
   D. cuticular & lenticular transpiration

5. Chloroplast splits water molecules to release oxygen and add hydrogen to carbon atoms in the formation of .....

   A. starch & water
   B. starch
   C. water
   D. sugar

6. The inner tissue of a leaf, containing many chloroplasts are known as;

A. mesophyll
B. stoma
C. stalk
D. vein

7. Plant growth can be measured in various ways. Which of these can be used as parameters to measure growth

a. Increase in length / height
b. Increase in dry weight
c. Increase in leaf area

A. a and b only
B. a and c only
C. b and c only
D. a, b and c

8. Name the plant hormone (plant growth regulator) which is responsible for the ripening of fruits?

A. Ethylene
B. Auxin
C. Traumatic
D. Cytokinin

9. According to mass flow hypothesis, mass flow of solute from source to sink is due to

A. concentration gradient
B. turgor pressure gradient
C. osmosis
D. osmosis and diffusion

10. Phloem loading is the transfer of sugar from

A. source to sink
B. leaves to sieve tubes
C. fruits to seed
D. all of these

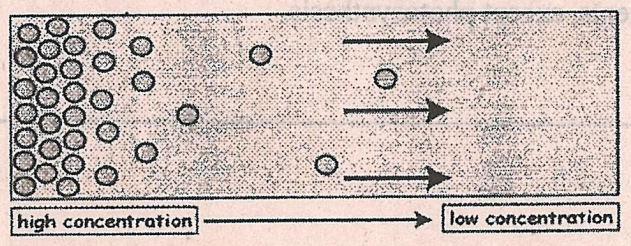
(1 × 10 = 10 marks)

Part 2 – Structured questions – Answer all questions. (20 minutes)

1. State the cell theory.

(3 marks)

2. Answer this question based on the given diagram.



Give the term used to designate the above process: ----------

Define the above term: ----------

(3 marks)

3. What is meant by tonicity of a solution?

(3 marks)

4. How can you categorize solutions based on their tonicity compared to that of another solution?

(6 marks)

5. Name three main forms of endocytosis.

(3 marks)

6. Name major categories of plant pigments.

(3 marks)

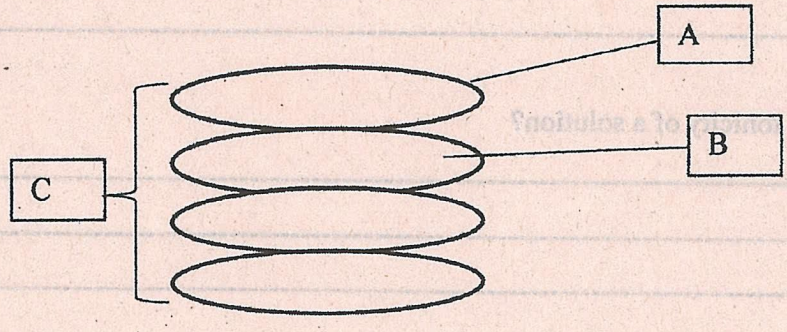
7. Name a function of plant pigments, except photosynthesis.

(2 marks)

8. Why plants are green?

(4 marks)

9. Name these A, B & C parts of a thylakoid.



A----------

B----------

C----------

(3 marks)

Part 3 – Essay questions – Answer three (03) questions only. (1 hour & 30 minutes)

01. i) What is respiration?

(3 marks)

ii) Briefly describe different types of respiration.

(5 marks)

iii) Name five (05) factors affecting plant respiration rate and briefly explain behavior of three (03) of them.

(12 marks)

02. i) What is meant by transpiration?

(3 marks)

ii) Name three (03) types of transpiration based on their sites of transpiration. Mention the percentage of water transpired by each type.

(3 marks)

iii) Name five (05) internal (plant) factors affecting the rate of the transpiration.

(5 marks)

iv) Briefly describe three (03) external (environmental) factors affecting the rate of the transpiration.

(9 marks)

03. i) Define photosynthesis?

(3 marks)

ii) Why the photosynthesis is important? State three reasons.

(3 marks)

iii) Write down the balanced formula of photosynthesis.

(5 marks)

iv) During the light reaction of photosynthesis, there are two possible pathways for electron flow. Name these two (02) pathways and state major differences of them.

(9 marks)

04. i) List five (05) Plant Growth and Yield parameters.

(5 marks)

ii) What is meant by "Plant Growth Rate"?

(3 marks)

iii) Briefly explain two (02) types of plant growth rate.

(6 marks)

iii) Describe "the typical growth curve for plants" with a diagram.

(6 marks)

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