



**University of Ruhuna- Faculty of Technology**  
**Bachelor of Biosystems Technology Honours Degree**  
**Level 1 (Semester I) Examination, July 2023**  
**Academic year 2021/2022**

**Course Unit: BST 1142 Plant Physiology (Theory)**  
**Duration: 1.5 hours**

Index No:

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Please **read** and **follow** the instructions given below

- Part I: 50 Minutes  
Answer all questions in the given space.
- Part II: 40 Minutes  
Answer 2 questions only and use a separate book for answering the questions.  
Each question should be started with a new page

**PART 1**

**Question 01**

i. How did the name derive as the “Fluid Mosaic Model” of the cell membrane? (6 marks)

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ii. List four (04) major functions of the plasma membrane. (8 marks)

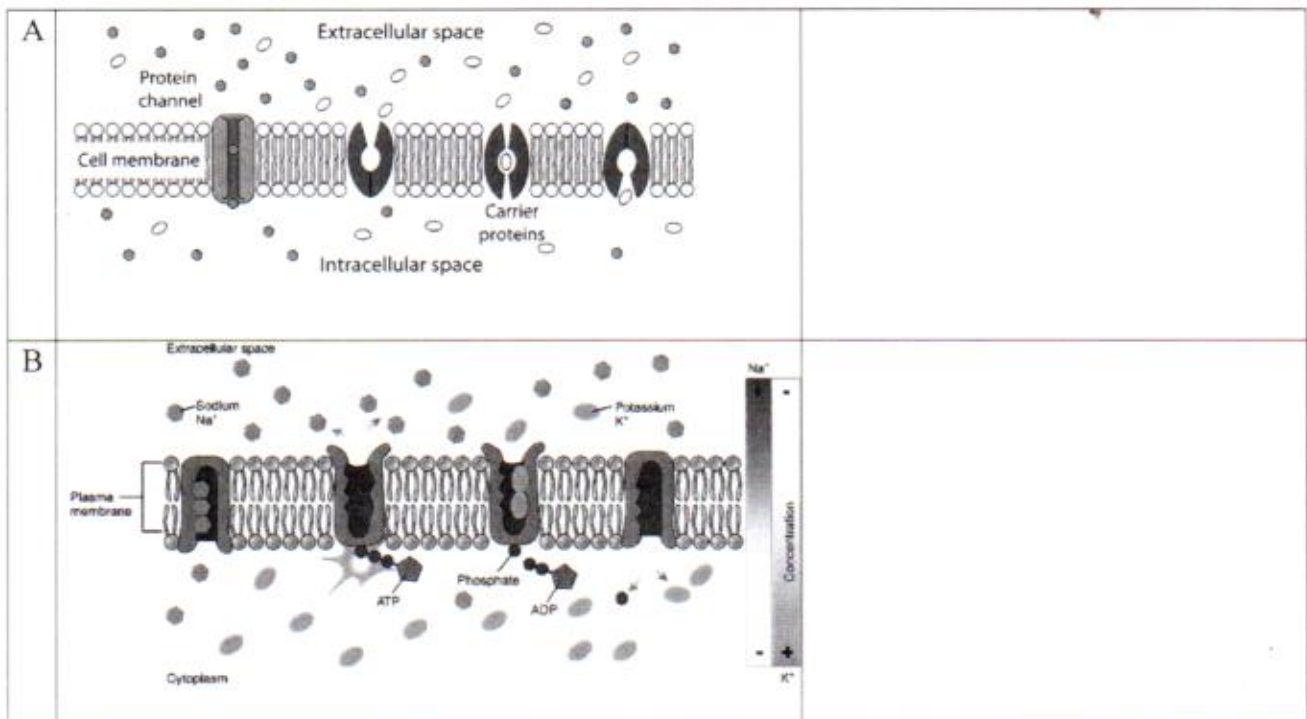
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iii. Identify cell transport types given in Figures A and B. Indicate the characteristic feature/s of each type in the given space. (10 marks)



iv. Identify tonicity types in A and B pictures. Explain the main features of each solution in the given space. (12 marks)

		Tonicity	Description
A			
B			

v. "Movement of photosynthates via the phloem from source to sink is the translocation"

a. Define the following terms. (6 marks)

I. Source - .....

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II. Sink - .....

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b. Describe how the girdling experiment can prove phloem translocation. (8 marks)

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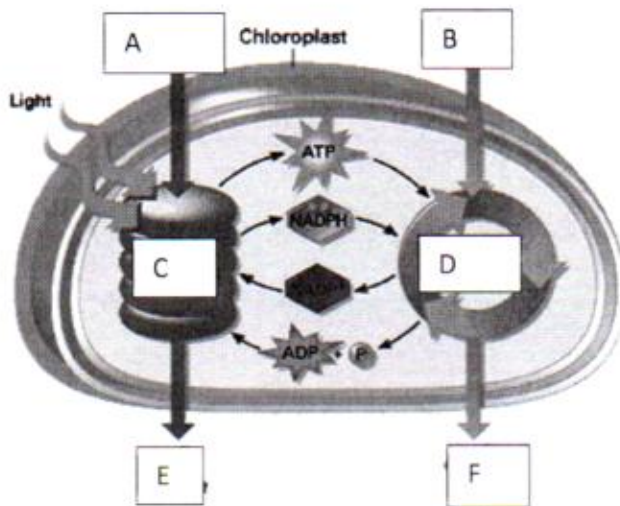
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**Question 02**

i. Write the balanced chemical equation for photosynthesis. (7 marks)

ii. Identify A, B, C, D, E and F. (18 marks)



A	
B	
C	
D	
E	
F	

iii. Fill the blanks with suitable words. (21 marks)

Type	Separation of initial CO <sub>2</sub> s fixation and Calvin cycle	Stomata open time	Best adapted environment	One Example
C3				
C4				
CAM				

iv. State four (4) major external factors that affect photosynthesis. (4 Marks)

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**Question 3**

*“Respiration is a biological process which use sugars produced during photosynthesis with oxygen to produce chemical energy for plant growth in a controlled manner”*

- i. List four (4) intrinsic factors that affect respiration. (8 Marks)

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- ii. Comment on the below statements. (20 marks)

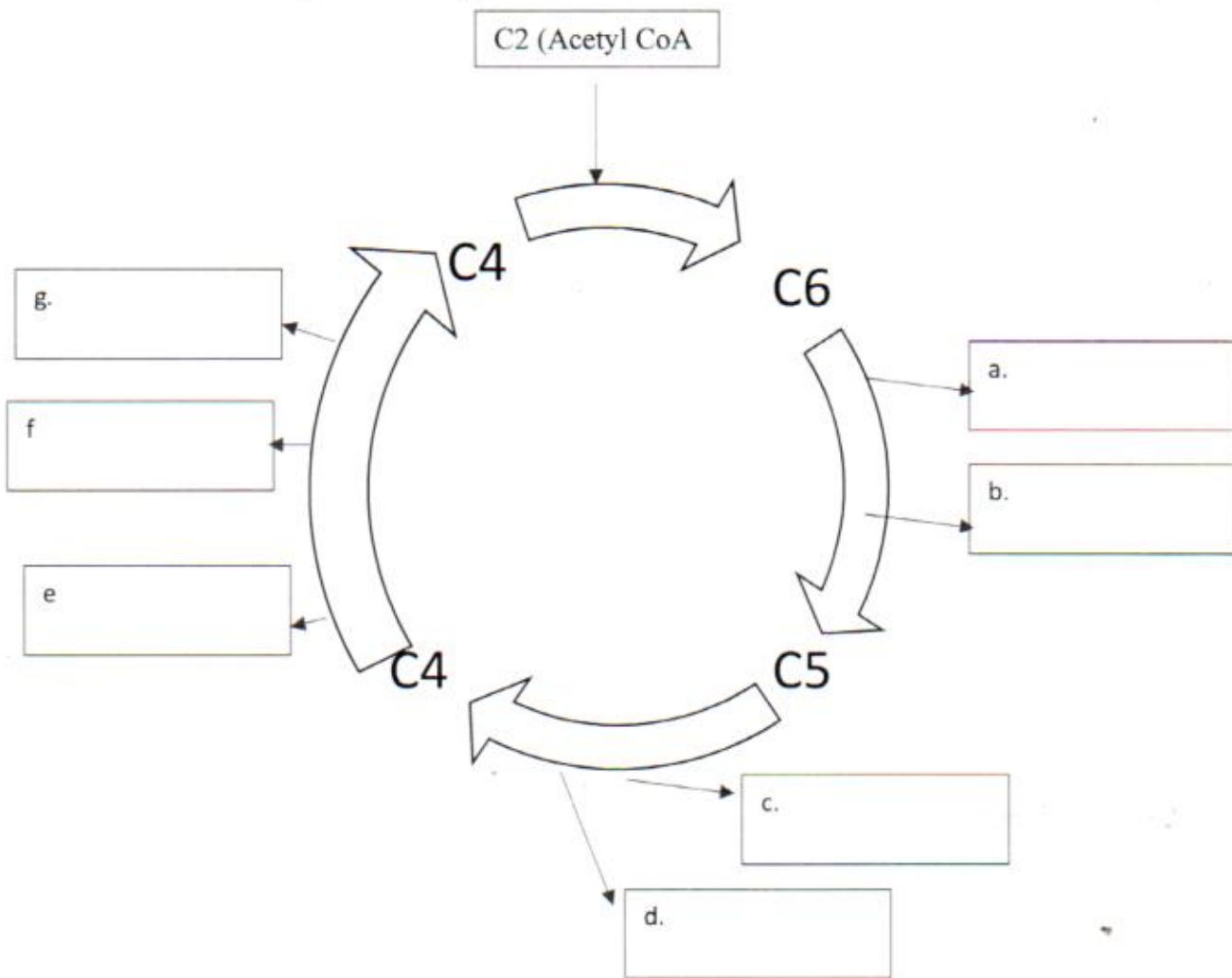
- a. High temperature increases the respiration of plants.

- b. Activity of plant organ determines the rate of maintenance respiration.

- c. Root hair helps in root respiration.

- d. Carbon balance of crop is influenced by respiration.

iii. Fill in the squares (a, b, c, d, e, f, and g) in the following flowchart giving molecules created or released during the Krebs cycle. (14 marks)



iv. All glucose carbon are not respired up to CO<sub>2</sub>. Name five (04) alternative end products of glucose carbon in respiration? (8 marks)

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**Question 4**

i. Mention four (4) types/sites of transpiration

(8 marks)

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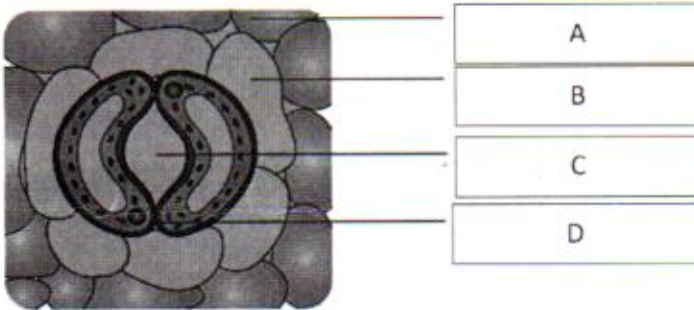
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ii. Name two distinguish features of Transpiration and Guttation.

(12 marks)

Transpiration	Guttation

iii. Identify A, B, C and D, and state one function each. (20 marks)



	Name	Function
A		
B		
C		
D		

iv. Mention two (02) anti-transpirants.

(4 marks)

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v. State two (2) structural adaptations of plants to reduce transpiration. Give your explanation.

(6 marks)

Modification	Explanation

@@@@@@@@@@@@ End of Part I @@@@@@@@@@@@@@

## PART 2

### Question 01

- i. Briefly discuss the role of pigments in plants. (20 marks)
- ii. Explain the light reaction of photosynthesis (30 marks)

### Question 02

- i. Briefly discuss the phloem protection mechanism. (20 marks)
- ii. Explain the phloem translocation of plants using the pressure flow model. (30 marks)

### Question 03

Write short notes on **any two (02)** of the followings. (50 marks)

- i. Types of plant respiration.
- ii. Typical plant growth curve.
- iii. Plant growth regulators and their functions.

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