

Registration Number:

Date & session:



ST. JOSEPH'S UNIVERSITY, BENGALURU -27
M.Sc. BOTANY – II SEMESTER
SEMESTER EXAMINATION: APRIL 2024
(Examination conducted in May / June 2024)
BO8523: PLANT PHYSIOLOGY AND METABOLISM

(For current batch students only)

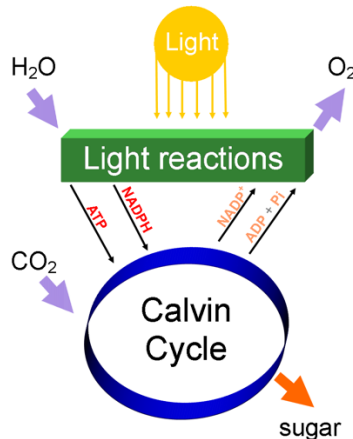
Time: 2 Hours

Max Marks: 50

This paper contains THREE printed page and THREE parts

A. Answer any FIVE of the following in two-three sentences each: 5 x 2 = 10

1. Name the mechanism/s by which water gets translocated into a plant system in the below situations. Briefly describe the processes.
 - (a) When seeds are soaked in water.
 - (b) When a 100 feet tall tree receives abundant water on a rainy day.
2. Given below are the events that take place during photosynthesis. Write the correct order of the events that take place during this process.

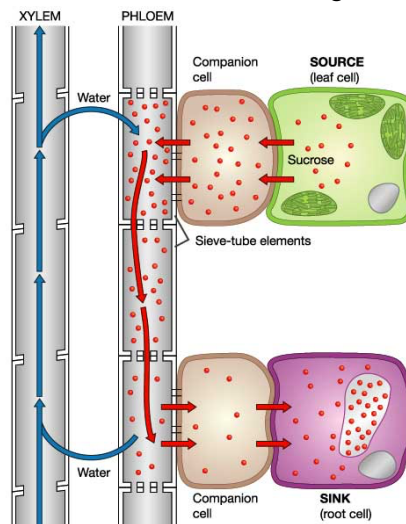


3. The process of glycolysis yielded 36 NADH and 72 ATP molecules. How many Glucose molecules were broken down in this process? Also mention the net ATPs generated under aerobic conditions from all the glucose molecules.
4. A container has one ripened and eight unripe oranges. Can the eight unripe oranges get ripened naturally overtime? If yes, name the chemical involved in the process and mention one of its properties.
5. Give the properties of allosteric enzymes with an example.
6. Draw and label the structure of ATP synthase
7. Below mentioned are different types of carbohydrates. Based on their complexity, classify and group them into their respective types.
Carbohydrates - Glucose, Starch, Maltose, Galactose, Glycogen, Sucrose, Fructose & Lactose.

B: Answer any FIVE of the following in detail:

5 x 6 = 30

8. With a schematic representation, explain the mechanism of non-cyclic electron transport.
9. What are the steps involved in the formation of root nodule?
10. What are the types of configurations of proteins? Give a detailed description of any two structural configurations of proteins.
11. At 1pm, on a bright sunny day when the relative humidity is high, Carbon dioxide levels are high, temperature is between 35°C – 40°C and the availability of water is low, explain the processes that could be happening inside a plant and also throw light upon roles of the external factors affecting the rate of transpiration.
12. Write an overview of glyoxylate cycle. Why glyoxylate cycle is not possible in humans?
13. Derive the Michelis- Menten equation.
14. Explain the mechanism of translocation of solutes using the below image.



C: Answer any ONE of the following in detail:

1 x 10 = 10

15. Elaborate on the carbon fixation in C3 plants.
16. (a) List out any five agricultural applications of phytohormones with suitable examples.
(b) Below mentioned are the phytohormones and their major physiological effects, find the correct match.

I	Auxins	a	They are found in higher concentrations in areas of rapid cell division as they promote cell division.
II	Cytokinin	b	Promotes fruit ripening
III	Gibberellins	c	It has a negative effect on plant growth and helps in inhibiting plant growth
IV	Abscisic acid	d	Causes root initiation in stem cuttings and are responsible for apical dominance in plants
V	Ethylene	e	Involved in breaking seed dormancy