ASSIGNMENT BOOKLET

Bachelor's Degree Programme

(BSCM)

(PLANT PHYSIOLOGY AND METABOLISM)

Valid from 1st January, 2026 to 31st December, 2026

School of Sciences
Indira Gandhi National Open University
Maidan Garhi, New Delhi-110068

(2025)

Dear Student,

Please read the section on assignments in the Programme Guide for B. Sc. that we sent you after your enrolment. A weightage of 30 per cent, as you are aware, has been earmarked for continuous evaluation, **which would consist of one tutor-marked assignment** for this course. The assignment is in this booklet, and is of 100 marks, of which 35% are needed to pass it.

Instructions for formatting your Assignments

Before attempting the assignment please read the following instructions carefully:

1) On top of the first page of your answer sheet, please write the details exactly in the following format:

ROLL NO.: …………………………………………

NAME: …………………………………………

ADDRESS: …………………………………………

…………………………………………

…………………………………………

COURSE CODE: …………………………….

COURSE TITLE: …………………………..

ASSIGNMENT NO.: ……………………….……

STUDY CENTRE: …………………….…....   **DATE:** ………………….…………..

PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATION AND TO AVOID DELAY.

2) Use only foolscap size writing paper (but not of very thin variety) for writing your answers.

3) Leave 4 cm margin on the left, top and bottom of your answer sheet.

4) Your answers should be precise.

5) Solve this assignment, and **submit the complete assignment answer sheets within the due date.**

6) The assignment answer sheets are to be submitted to your Study Centre within the due date. **Answer sheets received after the due date shall not be accepted.**

    We strongly suggest that you retain a copy of your answer sheets.

7) This assignment is **valid from 1st January 2025 to 31st December, 2025**. If you have failed in this assignment or fail to submit it by December, 2025, then you need to get the assignment for the year 2026, and submit it as per the instructions given in the Programme Guide.

8) **You cannot fill the examination form for this course** until you have submitted this assignment.

We wish you good luck.

ASSIGNMENT
(Tutor Marked Assignment)

Note: Attempt all questions. The marks for each question are indicated against it.

1. Differentiate between the following pairs of terms: $(4 \times 2\frac{1}{2}=10)$

   i). Photophosphorylation and Oxidative phosphorylation

   ii). Competitive and Non-competitive inhibition

   iii). Diffusion and Osmosis

   iv). C_3 and C_4 plants

2. Explain Krebs cycle. Highlight the metabolic intermediates and sites for NADH, FADH2 and ATP production. (10)

3. a). Define the term 'Vernalization'. What role does it play in agriculture? (5)

   b). Explain active transport of metabolites through ionic pumps. (5)

4. a). Explain the mechanism of allosteric enzyme regulation. (5)

   b). Discuss the mechanism of opening and closing of stomata. (5)

5. a). Discuss the functions of essential elements. (5)

   b). What is stress ? Discuss temperature induced stress. (5)

6. Write short notes on any *two* of the following : (5×2=10)

   i). Protoosmotic model for phloem transport

   ii). Photorespiration

   iii). Bioassays for auxins

   iv). Phytochrome-mediated responses

7. a). State whether the following statements are 'True' or 'False': (4×1=4)

   i). Hydrophilic amino acids create a water-free zone within protein molecules.

   ii). Wavelength greater than 700 nm are utilized by bacteria for photosynthesis.

   iii). The upward movement of water is known as the ascent of sap.

   iv). Uncompetitive inhibition is observed when substrate and inhibitor compete for the same active site of the enzyme.

   b). Fill in the blanks:

   i). The response of a plant part towards gravity is called ………………… . (4×1=4)

ii). In leguminous plants, leghaemoglobin protects ……………… activity.

iii). The net gain of ATP by complete oxidation of one glucose molecule is ………………… .

iv). Cells undergo plasmolysis when kept in a ………………… solution.

c). Match the items given under column 'A' with those given under column 'B': $(4 \times \frac{1}{2} = 2)$

Column A		Column B	
i)	Boron	a)	Component of ferrodoxin
ii)	Molybdenum	b)	Needed for synthesis of auxins
iii)	Zinc	c)	Component of nitrogenase
iv)	Iron	d)	Pollen germination

8. a). Give a graphical account of glycolysis. (5)

b). Give an account of Z-scheme involving non-cyclic and cyclic photophosphorylation. (5)

9. a). Discuss various factors that influence Nitrogenase activity. (5)

b). Discuss the importance of plant accessory pigments. (5)

10. a). Explain the polymer trapping model for symplastic loading of phloem. (5)

b). Explain the components of water potential. (5)