

**ASSIGNMENT BOOKLET**

**Bachelor's Degree Programme  
B.Sc. Honours in Biochemistry (BSCBCH)**

**METABOLISM OF CARBOHYDRATES AND LIPIDS  
(Valid from 1<sup>st</sup> January, 2023 to 31<sup>st</sup> December, 2023)**



**School of Sciences  
Indira Gandhi National Open University  
Maidan Garhi, New Delhi-110068  
(2023)**

Dear Student,

Please read the section on assignments in the Programme Guide of B.Sc. (Hons.) Biochemistry (BSCBCH) programme that we sent you after your enrolment. A weightage of 30 percent, 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 it consists of two parts, Part A and B. It covers all blocks of the course. The total marks of all the parts are 100, of which 35% are needed to pass it.

### **Instructions For Formatting Your Tutor Marked Assignments (TMA)**

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:

**You may reproduce the Course Code and Assignment Code from the assignment.**

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**ENROLMENT  
NO.:**

<b>PROGRAMME TITLE</b>	: .....	<b>NAME:</b> .....
<b>COURSE CODE</b>	: .....	<b>ADDRESS:</b> .....
		.....
<b>COURSE TITLE</b>	: .....	.....
<b>ASSIGNMENT CODE</b>	: .....	<b>SIGNATURE:</b> .....
		.
<b>STUDY CENTRE</b>	: .....	<b>DATE:</b> .....

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

2. Use only foolscap size paper for your response and tie all the pages carefully. Avoid using very thin paper. Allow a 4 cm margin on the left and at least 4 lines in between each answer. This would facilitate the evaluator to write useful comments in the margin at appropriate places.
3. Write the responses in your own handwriting. Do not print or type the answers. Do not copy your answers from the Units/Blocks sent to you by the University. It is advised to write your answers in your own words as it will help in grasping the study material.
4. Do not copy from the response sheets of other students. If copying is noticed, the assignment will be rejected.
5. Write each assignment separately. All the assignments should not be written in continuity.
6. Write the question number with each answer.
7. **The completed assignment should be submitted within the due date** to the Coordinator of the Study Centre allotted to you. TMAs submitted at any other place and after due date will not be evaluated.
8. After submitting the TMA, get the acknowledgement from the Coordinator on the prescribed assignment remittance-cum-acknowledgement card. **We strongly suggest that you retain a copy of your answer sheets.**
9. In case you have requested for a change of Study Centre, you should submit your TMA only to the original Study Centre until the change of Study Centre is notified by the University.
10. This assignment is **valid from 1st Jan, 2023 to 31st Dec, 2023**. If you have failed in this assignment or fail to submit it by Dec, 2023, then you need to get the assignment for the year 2024, and submit it as per the instructions given in the Programme Guide.
11. **You cannot fill the examination form for this course** until you have submitted this assignment.

We wish you good luck.

## ASSIGNMENT

### Metabolism of carbohydrates and lipids Core Course in Biochemistry

Course Code: **BBCCT-109**

Assignment code: **BBCCT-109/TMA/2023**

Maximum marks: **100**

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

Write the answers in your own words; do not copy from the course material.

#### PART-(A)

Marks: 50

1. Define the terms:

(5X2= 10)

- (a) Autotrophs
- (b) Amphibolic reactions
- (c) Fermentation
- (d) Primary metabolic pathways
- (e) Anabolism

2. (a) Explain metabolism and write its functions.

(2+3)

(b) What is substrate level phosphorylation? Write reactions of glycolysis in which substrate level phosphorylation takes place.

(5)

3. (a) With the help of a neatly labeled diagram, explain different steps of TCA cycle and its significance.

(5)

(b) Describe the coordinated regulation of TCA and glyoxylate cycles.

(5)

4. (a) Describe the process of glycogenesis.

(5)

(b) What are glycogen storage diseases? Explain any two.

(5)

5. (a) Explain the mechanisms involved in concentration of CO<sub>2</sub> in C<sub>4</sub> plants and indicate the relevance of these adaptations for plant growth

(5)

(b) Compare the characteristics of C<sub>3</sub>, C<sub>4</sub> and CAM plants

(5)

#### PART- (B)

Marks: 50

6. (a) How are fatty acids activated and transported to the site of their oxidation? (5)

- (b) Define ketogenesis, is it a normal, physiological process? Explain why it goes up in conditions of starvation and uncontrolled diabetes? (5)
7. (a) How does  $\beta$  oxidation of fatty acids in peroxisomes different from that occurring in mitochondria? (5)
- (b) Illustrate organization of various domains of animal fatty acid synthase and write their activities. (5)
8. (a) Explain the allosteric resgulation of fatty acid biosynthesis. (5)
- (b) Write the role of various lipoproteins in lipid transport. (5)
9. (a) What are the four different pathways of TAG synthesis? Explain any one. (5)
- (b) How is cholesterol biosynthesis regulated? (5)
10. (a) Which is the major phospholipid present in human lung surfactant and how is it synthesized? (5)
- (b) Name the lipid that accumulates in Faber's disease and Tay-Sach's disease. Explain the signs and symptoms of these diseases. (5)