

**ASSIGNMENT BOOKLET**

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

**METABOLISM OF CARBOHYDRATES AND LIPIDS  
(Valid from 1<sup>st</sup> July, 2021 to 30<sup>th</sup> June, 2022)**



**School of Sciences  
Indira Gandhi National Open University  
Maidan Garhi, New Delhi-110068  
(2021-2022)**

Dear Student,

Please read the section on assignments in the Programme Guide of B.Sc. (Hons.) Biochemistry (BSCBCH) 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 Jul, 2021 to 30th Jun, 2022**. If you have failed in this assignment or fail to submit it by Jun, 2022, then you need to get the assignment for the year 2022-23, 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/2021-2022**

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) Chemoautotrophs
  - (b) Anaplerotic reactions
  - (c) Obligate anaerobes
  - (d) Fermentation
  - (e) Catabolism
  
2. (a) Which factors account for high phosphoryl group transfer potential of ATP? Name two compounds having phosphoryl group transfer potential higher than ATP. (4+1)  
(b) What is glycolysis? Draw reactions of its two phases and label their reactants, products and enzymes. (5)
  
3. (a) With the help of a neatly labeled diagram, explain different steps of conversion of pyruvate to acetyl CoA by PDH complex. (5)  
(b) Write a short note on Pentose phosphate pathway and its importance. (5)
  
4. (a) Justify, glycolysis and gluconeogenesis from pyruvate are not simple reversal of each other. (5)  
(b) Explain coordinated regulation of glycogenesis and glycogenolysis. (5)
  
5. (a) What is photorespiration? Explain its significance? (5)  
(b) Explain the partitioning of fixed carbon to sucrose and starch synthesis in leaf cells. (5)

#### PART- (B)

Marks: 50

6. (a) What are the end products of  $\beta$ - oxidation of odd and even chain fatty acids? Describe regulation of  $\beta$ - oxidation of fatty acids? (1+4)

- (b) Define ketogenesis, is it a normal, physiological process? Explain why it goes up in conditions of starvation and uncontrolled diabetes? (5)
7. (a) Calculate the number of ATP produced during conversion of palmitate to acetoacetate in liver with justification. (5)  
(b) Illustrate organization of various domains of animal fatty acids synthase and write their activities. (5)
8. (a) Describe regulation of *de novo* lipogenesis in mammals. (5)  
(b) Write steps in formation of stearic acid and oleic acid from palmitic acid. (5)
9. (a) Write in brief about the four stages of cholesterol biosynthesis. (5)  
(b) How is cholesterol biosynthesis regulated? (5)
10. (a) How is ceramide converted to phosphosphingolipids? (5)  
(b) What are different fates of glucose in liver in a well fed state? (5)