MCH-015

ASSIGNMENT BOOKLET

M.Sc. in Chemistry and Analytical Chemistry Programme
(MSCCHEM/MSCANCHEM)

Biology for Chemists

(Valid from July, 2025 to June, 2026)

It is compulsory to submit the assignment before filling in the examination form.

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

(2026)

Dear Learner,

Please read the Section on Assignments in the Programme Guide for M.Sc. in Chemistry Programme 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 covers both the blocks of the course. The total marks of all the parts are 100, of which 40% 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:

ENROLMENT NO. : ……...
NAME **:** ……
ADDRESS **:** ……...
……
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COURSE CODE **:** …….
COURSE TITLE **: ……..**
ASSIGNMENT NO. : ……...
STUDY CENTRE : ……..… **DATE : ……...**
(NAME AND CODE)

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

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

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

4) Your answers should be precise.

5) 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 July, 2025 to June 2026. If you have failed in this assignment or fail to submit it by June 2026, 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 the assignment.

Wishing you good luck

Tutor Marked Assignment
Biology for Chemists

Course Code: MCH-015
Assignment Code: MCH-015/TMA/2025-26
Maximum Marks: 100

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

1. a) What will be the sequence of separation of the organelles, ribosomes, nucleus and mitochondria in a tissue homogenate when subjected to centrifugation. Explain your answer. (5)
   b) Briefly describe different modes through which cell membrane controls the transport of ingoing and outgoing molecules? (5)

2. a) What are anomers? Explain the existence of anomers in sugars taking D-glucose as an illustrative case. (5)
   b) Discuss the classification of carbohydrates on the basis of number of saccharide units giving example of each class. (5)

3. a) A fat has low iodine number and a high saponification number. What do you infer from that? What are essential fatty acids and why are they essential? (5)
   b) Explain the 'fluid mosaic model' for membrane structure. (5)

4. a) Draw the structure of a dinucleotide of adenosine – 5' – phosphate and uridine – 5'– phosphate. In which process of protein biosynthesis, t RNA is involved? Illustrate the gross structural features of t - RNA. Indicate the different regions. (5)
   b) Write a short note on the different forms of RNA. (5)

5. a) What are the structural and functional differences between myoglobin and haemoglobin? (5)
   b) How is the standard free energy for chemical reactions different from the standard free energy for biochemical reactions? (5)

6. a) With the help of an example explain the significance of coupling in biological reactions. (5)
   b) Explain homeostasis. How is the water balance maintained in the body? (5)

7. Write short notes on the following:
   a) Mitchell's chemiosmotic hypothesis (5)
   b) ATP – the energy currency of cell (5)

8. a) Compare the functions of RNA polymerase with DNA polymerase. How is transcription terminated? (5)
   b) Explain the mechanism of action of the enzyme aconitase on citrate in TCA cycle. (5)

9. Compare the following:
   a) Energetics of metabolic oxidation of glucose and a fatty acid (5)
   b) Biosynthesis and β-oxidation of fatty acids (5)

10. a) List different types of antibodies. What are the gross structural features of an antibody molecule? Discuss any one mechanism by which antibodies interact with antigens. (5)
    b) Discuss the "specific immunologic tolerance" theory of immune response. (5)