CHE-09

ASSIGNMENT BOOKLET

Bachelor's Degree Programme (B.Sc.)

BIOCHEMISTRY

(Valid from 1st January, 2019 to 31st December, 2019)

It is Compulsory to submit the Assignment before filling in the Term-End Examination Form.

Please Note

- **You can take electives (56 to 64 credits) from a minimum of TWO and a maximum of FOUR science disciplines, viz. Physics, Chemistry, Life Sciences and Mathematics.**
- **You can opt for elective courses worth a MINIMUM OF 8 CREDITS and a MAXIMUM OF 48 CREDITS from any of these four disciplines.**
- **At least 25% of the total credits that you register for in the elective courses from Life Sciences, Chemistry and Physics disciplines must be from the laboratory courses. For example, if you opt for a total of 64 credits of electives in these 3 disciplines, at least 16 credits should be from lab courses.**
- **You cannot appear in the Term-End Examination of any course without registering for the course. Otherwise, your result will not be declared and the onus will be on you.**

School of Sciences
Indira Gandhi National Open University
New Delhi
(2019)

Dear Student,

We hope, you are familiar with the system of evaluation to be followed for the Bachelor's Degree Programme. At this stage you may probably like to re-read the section on assignments in the Programme Guide 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. The assignment is based on Blocks 1, 2, 3 and 4.

Instructions for Formatting Your Assignments

Before attempting the assignments, 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 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 While writing answers, clearly indicate the Question No. and part of the question being solved.

6 Please note that:

i) The Assignment is valid from 1st January, 2019 to 31st December, 2019.

ii) The response to this assignment is to be submitted to the Study Centre Coordinator within eight weeks of the receipt of this booklet in order to get the feedback and comments on the evaluated assignment.

iii) In any case, you have to submit the assignment response before appearing in the term end examination.

7 We strongly suggest that you should retain a copy of your assignment responses.

Wishing you all good luck.

Tutor Marked Assignment
BIOCHEMISTRY
An Elective Course in Chemistry and Life Sciences

Course Code: CHE-09
Assignment Code: CHE-09/TMA/2019
Maximum Marks: 100

Answer all the questions given below.

1. a) Explain the structure and functions of mitochondria. (5)
   b) Why do monosaccharides form cyclic structure? Draw the structures of open chain and cyclic forms of glucose. (5)
2. a) Define disaccharides. Write structures for disaccharides in which glucose units are linked together in the following ways. (5)
   i) α - 1,4 ii) β - 1,4 iii) α - 1,6 iv) β - 1,6
   b) What is the difference between a fat and a fatty acid? What is the significance of iodine number for a fatty acid? Explain with the help of an example. (5)
3. a) What are the similarities with respect to composition in the four DNA nucleotides? (5)
   b) What are the functional roles of tRNA and rRNA? Explain how these are structurally different and where are these RNAs found in cell? (5)
4. a) Describe the isoelectric point. With the help of an example explain the utility of this property of amino acids and how it is useful in maintaining pH in human systems. (5)
   b) Explain the stereochemistry of peptide bond. What do the ϕ and ψ angles signify in peptides? (5)
5. a) What are the various types of specificities exhibited by enzymes? Illustrate your answer with an example for each. (5)
   b) Give the role of following vitamins in biochemical reactions. Explain with the help of an example. (5)
   i) Thiamine ii) Pyridoxine iii) Riboflavin
6. a) What is the significance of oxidative phosphorylation? Illustrate with the help of two examples. (5)
   b) Differentiate between the following with the help of examples in each case. i) Convergent and Divergent nature of catabolism and anabolism respectively ii) Homolactic and Alcoholic fermentation (5)
7. a) How is the enzyme pyruvate dehydrogenase complex different from other enzymes? Explain how it functions in the conversion of pyruvate to acetyl- CoA. (5)
   b) How is the conversion of fatty acid to acyl - CoA accomplished thermodynamically? Explain giving the reactions involved. (5)
8. a) Explain the following terms: (5)
   (i) Constitutive and induced enzymes (ii) Metabolic regulation
   (iii) Product inhibition
   b) Explain the role of uncouplers in electron transport chain or oxidative phosphorylation. Illustrate your answer with the help of an example. (5)
9. a) What is the difference between the electron transport reactions of mitochondria and the ones which take place in photosynthetic process? (5)
   b) Explain the following terms. (5)
   i) Termination codons ii) Lac operon
   iii) Chemical carcinogens iv) Immobilised enzyme
10. a) Discuss briefly the experiment of Griffith and Avery. (5)
    b) What are the factors that affect the immune response? Differentiate between the cellular and humoral immunity. (5)