

**ASSIGNMENT BOOKLET****Bachelor's Degree Programme (B.Sc.)****ORGANIC REACTION MECHANISM****(Valid from 1<sup>st</sup> January, 2024 to 31<sup>st</sup> December, 2024)****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  
Madian Garhi, New Delhi - 110068  
(2024)

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 per cent, 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:.....

.....

.....

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 1<sup>st</sup> January, 2024 to 31<sup>st</sup> December, 2024.
  - 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**  
**Organic Reaction Mechanism**  
**Elective Course in Chemistry**

Course Code: CHE-06  
 Assignment Code: CHE-06/TMA/2024  
 Maximum Marks: 100

**Note:** Answer all the questions given below.

1. a) Which of the carbocation is more stable in the following pairs and why? (5)
- i)  $\text{NCCH}^+ - \text{CH}_3$  or  $\text{CNCH}^+ - \text{CH}_3$   
 Secondary  $\overset{+}{\text{C}}$                       Primary  $\overset{+}{\text{C}}$
- ii)  $\text{CICH}^+ - \text{CH}_3$  or  $\text{CICH}_2 - \overset{+}{\text{C}}\text{H}_2$   
 Secondary  $\overset{+}{\text{C}}$                       Primary  $\overset{+}{\text{C}}$
- b) Explain the following: (5)
- i) Enol form does not react with water to give diol.  
 ii) Fluorine and iodine generally do not react with alkene or alkyne.  
 iii) Hydroboration looks like an anti-Markownikowf's addition.
2. Explain the following: (10)
- a) Electron withdrawing substituents at the carbonyl carbon increases the reactivity towards nucleophilic addition reactions.  
 b) Reaction of hydrocyanic acid and benzaldehyde is very slow, but become fast when cyanide ion is added.
3. a) Explain isotope effect in E2 elimination reaction with suitable example. (5)  
 b) Differentiate Saytzeff and Hofmann rules giving suitable examples. (5)
4. a) State oxidation state. Calculate the oxidation state of carbon atom of  $\text{CCl}_4$ . (5)  
 b) Predict the product(s) and give the mechanism of the following reactions: (5)
- i)  $\text{CH}_3\text{C}\equiv\text{CCH}_2\text{CH}_3 \xrightarrow[2. \text{H}_2\text{O}]{1. \text{Na, Li, NH}_3} \text{---}$
- ii)  $\text{CH}_3(\text{CH}_2)_7\text{COCH}_3 \xrightarrow{\text{LiAlH}_4/\text{H}^+} \text{---}$
5. Write short note on the following: (Give mechanism) (10)
- a) Aldol condensation  
 b) Michael addition
6. Write the chemical reaction for the following reactions along with their detail description: (10)

- a) Reimer-Tiemann reaction
  - b) Carbylamine reaction
  - c) Wittig reaction
  - d) Wolf rearrangement
7. a) Explain, why the reaction of *m*-bromoanisole with sodamide gives only one product. (5)
- b) Describe the bromination reaction at alkylic and benzylic position by N-bromosuccinimide. (5)
8. a) Write detail mechanism for the following rearrangements: (5)
- i) Wagner-Meerwein rearrangement
  - ii) Beckmann rearrangement
- b) Explain the mechanism of [4+2] cycloaddition. (5)
9. a) Taking suitable examples, explain the role of sensitizers in photo reactions. (5)
- b) Describe reaction types used to construct a carbon skeleton with suitable examples. (5)
10. Write short notes on: (10)
- a) Cleaning action of soaps
  - b) Auxochromes
  - c) Antibiotics
  - d) Condensation polymers
  - e) Retrosynthesis