

ASSIGNMENT BOOKLET**Organic Chemistry
Bachelor's Degree Programme (B.Sc.)****(Valid from 1st January, 2024 to 31st December, 2024)****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
Maidan Garhi, New Delhi
(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 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:.....

.....

.....

COURSE CODE :

COURSE TITLE :

ASSIGNMENT NO.:

STUDY CENTRE :
(NAME AND CODE)

DATE:.....

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, 2024 to 31st 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
CHE-05: ORGANIC CHEMISTRY

Course Code: CHE-05
Assignment Code: CHE-05/TMA/2024
Maximum Marks: 100

Note: * This assignment is based on all the four Blocks of the entire course.
* All questions are compulsory. Marks for the questions are shown within brackets on the right hand side.
* Please answer in your **own words**; do not copy from the course material.

1. (a) Give the IUPAC names of the following compounds: (3)
 - (i)
$$\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{C}\equiv\text{C}-\text{CH}_3 \end{array}$$
 - (ii) $\text{CH}_3\text{CBr}_2\text{CH}_3$
 - (iii)
$$\begin{array}{c} \text{O} \\ || \\ \text{HOOCCH}_2\text{CH}_2\text{CH}_2\text{CCH}_3 \end{array}$$
- (b) Write the structure of the following compounds: (2)
 - (i) Pentanedinitrile
 - (ii) *N*-ethyl-*N*-propylpropanamine
2. Discuss the optical activity of the following molecules giving suitable diagrams. (5)
 - (i) *trans*-dichloroethene
 - (ii) *meso*-tartaric acid
3. Draw the conformations of 1,3-dimethylcyclohexane. Which of these conformations is more stable and why? (5)
4. Draw the possible modes of vibrations of CH_2 group present a molecule. (5)
5. Briefly explain the guidelines/ rules to predict the relative importance of resonance structures in different molecules/species of organic compounds. (5)
6. Define octane number. What are different factors affecting the octane number of a compound. (2+2+1)
Give examples of additives used to increase the octane number.
7. What is Witting reactions? Give the mechanism of this reaction. (2+3)
8. (a) How can you distinguish between terminal and internal alkynes using IR spectrum? (2)
(b) How can you convert butane to 2-butyne. (3)
9. Which position of naphthalene is more active towards electrophilic substitution? Explain giving suitable structures. (5)
10. (a) Give any two methods of preparations of pyrrole. Also write the reactions involved. (2)
(b) Write the resonance structures of pyridine-*N*-oxide. (3)

11. Discuss the reactivity of allylic and benzylic halides in nucleophilic substitution reactions. (5)
12. (a) How will you prepare phenol from benzene? Give the sequence of the reactions involved. (3)
- (b) Give the preparation and use of nitroglycerin. (2)
13. Write the products of the following reactions of epoxides: (5)
- (i) $\text{oxirane} + \text{H}_2\text{O} \xrightarrow{^-\text{OH}} \dots\dots$
- (ii) $\text{oxirane} + \text{CH}_3\text{OH} \xrightarrow{^-\text{OCH}_3} \dots\dots$
- (iii) $\text{oxirane} + \text{RMgX} \longrightarrow \dots\dots \xrightarrow{\text{H}^+/\text{H}_2\text{O}} \dots\dots$
- (iv) $\text{oxirane} \xrightarrow{\text{heat}} \dots\dots$
- (v) $\text{oxirane} \xrightarrow{\text{LiAlH}_4} \dots\dots$
14. Write chemical reactions for the following named reactions: (1×5)
- (i) Etard's reaction
- (ii) Gattermann-Koch synthesis
- (iii) Gattermann synthesis
- (iv) Wacker process
- (v) Friedel-Crafts acylation
15. Write chemical equations and reaction conditions for any **five** methods of preparation of carboxylic acids. (5)
16. What is Michael addition? Explain giving suitable example and the mechanism involved. (5)
17. Discuss the reduction of alkynyl halides using different reagents. Write the reactions involved and the products formed. (5)
18. (i) Explain Henry reaction by giving a suitable example. (3)
- (ii) Write important uses of nitro compounds giving suitable examples. (2)
19. How will you differentiate between primary, secondary and tertiary amines using nitrosation reaction? (5)
20. Discuss the structure of starch giving the type of bonding and the components. (5)