

**MCH-019**

**ASSIGNMENTBOOKLET**

**M.Sc. in Chemistry Programme  
(MSCCHEM)**

**M.Sc. in Analytical Chemistry Programme  
(MSCANCHEM)**

**GREEN CHEMISTRY**

**(Valid from July, 2025 to December, 2025)**

**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  
(2025)

Dear Learner,

Please read the Section on assignments in the Programme Guide for M.Sc. in Chemistry/M.Sc.in Analytical Chemistry 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 all the four 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:

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**ENROLMENT NO.:** .....

**NAME** : .....

**ADDRESS** : .....

.....

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**COURSE CODE** : .....

**COURSE TITLE** : .....

**ASSIGNMENT NO. :** .....

**STUDY CENTRE** : ..... **DATE:**.....

**(NAME AND CODE)**

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**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 4cm 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 solved assignment.***

- 7) This assignment is valid from **1<sup>st</sup> July, 2025 to 31<sup>st</sup> December, 2025**. If you have failed in this assignment or fail to submit it by **31<sup>st</sup> December, 2025**, 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

## Green Chemistry

Course Code: MCH-019  
Assignment Code: MCH-019/TMA/2025  
Maximum Marks: 100

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

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1. List the twelve principles of green chemistry. (5)
2. Explain the principle of using safer solvents and auxiliaries. (5)
3. Explain the terms-‘reaction yield’ and ‘atom economy’. How are these two different? (5)
4. What aspects should be kept in mind while selecting a proper feedstock for synthesis from green chemistry point of view? (5)
5. What are VOCs? Give examples. Explain various sources of VOCs. (5)
6. Explain various type of chemical reactions giving a suitable example for each. (5)
7. When we search the literature available for a particular compound, what questions we should explore about it to know that it is a safe chemical. (5)
8. Discuss various aspects of toxicity of a chemical to the humans to be considered while making a wiser choice from the available options. (5)
9. Illustrate how chemicals can harm and changes the local environment. (5)
10. Discuss the harmful effects of global climate change. (5)
11. Explain the Boots synthesis of ibuprofen giving the chemical reactions involved. (5)
12. Discuss the reactions involved in the greener synthesis of ibuprofen. Why is it greener as compared to Boots synthesis? (5)
13. Explain the importance of adipic acid. Write the scheme of its synthesis starting from benzene. (5)
14. Discuss the harmful effects of the chemicals used in the above synthesis (Q.13) of adipic acid. (5)
15. What are antifoulants? Discuss the harmful effects of TBTO. (5)
16. Explain the harmful effects of blowing agents used in the manufacturing of EPS. (5)
17. What are the implications of using chlorine for obtaining white paper? Explain. (5)
18. Discuss the role of TAML activators in the bleaching of paper. (5)
19. Explain the synthesis of PET starting from *p*-xylene. Write the reactions involved. (5)
20. Discuss the application of green chemistry in the synthesis of drugs simvastatin, naproxen and aspirin. List some greener methods of synthesis being used these days in chemical laboratories. (3+2)