

ASSIGNMENT BOOKLET**Organic Chemistry****Bachelor's Degree Programme (B.Sc.)****(Valid from 1st January, 2013 to 31st December, 2013)****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
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(2013)**

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 : 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, 2013 to 31st December, 2013.
 - 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.**

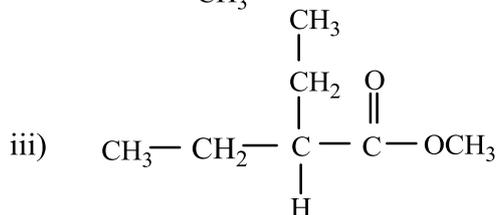
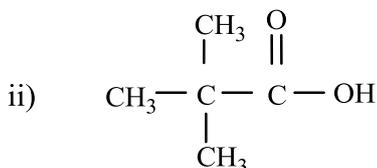
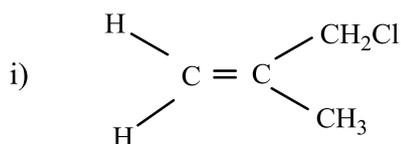
Tutor Marked Assignment

Organic Chemistry

Course Code: CHE-05
Assignment Code; CHE-05/TMA/2013
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.

Q.1 a) Give the IUPAC names of the following compounds:



(3)

b) Write the structures of the following compounds:

i) 2-Methylbutanenitrile

ii) 4-Phenylbutanoyl chloride

(2)

Q.2 Explain different elements of symmetry giving suitable examples.

(5)

Q.3 Draw various conformations of *cis*-1,2-dimethylcyclohexane and *trans*-1,2-dimethylcyclohexane. Also explain the relative stabilities of different conformations.

(5)

Q.4 Discuss various intermolecular forces present in organic molecules. Give suitable examples of the molecules also.

(5)

Q.5 What is hyperconjugation? Explain the stability of carbocations using hyperconjugation.

(5)

Q.6 a) Explain various methods of preparation of cycloalkanes.

(3)

b) Give various products of nitration of propane.

(2)

Q.7 a) Explain the orbital picture of allene molecule.

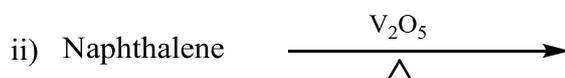
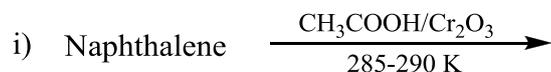
(2)

b) Discuss various features of Wittig reaction.

(3)

- Q.8 a) Explain the spectral characteristics of alkynes. (3)
- b) What is hydroboration reaction? Give the products of hydroboration of 2-hexyne. (2)

- Q.9 a) What is Friedel-Crafts acylation? What is its synthetic utility? (2)
- b) Complete the following reactions:



- Q.10 a) Explain how Paal Knorr synthesis is used for synthesizing various categories of heterocyclic compounds. (3)
- b) What products are obtained by the nitration and bromination of pyridine? (2)

Q. 11 How would you carry out following conversions:

- i) $\text{ArNH}_2 \longrightarrow \text{ArX}$
- ii) $\text{C}_6\text{H}_6 \longrightarrow \text{C}_6\text{H}_5\text{OH}$
- iii) $\text{CH}_3\text{CH}=\text{CH}_2 \longrightarrow \text{CH}_2\text{OH CH OH CH}_2\text{OH}$
- iv) $\text{C}_6\text{H}_5\text{CH}(\text{CH}_3)_2 \longrightarrow \text{C}_6\text{H}_5\text{OH}$
- v) $\text{C}_6\text{H}_5\text{OCH}_3 \longrightarrow \text{C}_6\text{H}_5\text{OH}$ (5)

- Q.12 a) Discuss the advantages of crown ethers in organic synthesis? ($2\frac{1}{2}$)
- b) Alcohols are not as strong acids as phenols, Explain. ($2\frac{1}{2}$)

Q.13 Taking a suitable example for each, write the mechanism of following reactions:

- i) Haloform reaction
- ii) Aldol condensation (5)

Q.14 Explain the following reactions with the help of suitable examples:

- i) E2 reaction
- ii) $\text{S}_{\text{N}}1$ reaction (5)

Q.15 Explain Hell-Vollhard-Zelinski reaction with the help of a suitable example. What is its synthetic importance? (5)

Q.16 How can you obtain a 3-hydroxy ester starting from 2-bromoester? What is the name of this reaction? (5)

Q.17 Briefly discuss various methods of reduction of carboxylic acid halides. (5)

Q.18 a) Explain Henry reaction. (2)

b) What are the important uses of nitro compounds? (3)

Q.19 How will you distinguish between primary, secondary and tertiary amines using Hinsberg test? Explain. (5)

Q.20 Explain the following:

i) Nucleotide

ii) Saponification value

iii) Acid value

iv) Monosaccharide

v) Peptide bond (5)