



UTTARAKHAND OPEN UNIVERSITY, HALDWANI (NAINITAL)
उत्तराखण्ड मुक्त विश्वविद्यालय, हल्द्वानी (नैनीताल)

M.Sc. Second Year Chemistry

Last Date of Submission:

15 May, 2014

Course Title: Natural Products, Heterocycles and Spectroscopy

Course Code: CHE553

Year: 2013-14

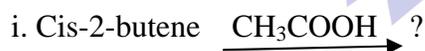
Maximum Marks: 40 Marks

Section 'A'

Section 'A' contains 08 short answer type questions of 5 marks each. Learners are required to answer 4 questions only. Answers of short answer-type questions must be restricted to 250 words approximately.

Briefly discuss the following:

1. Write down the synthesis of Reserpine and morphine. Give their Stereochemistry?
2. Explain general methods of isolation of terpenoids?
3. Give the methods and isolation and structure determination of alkaloids.
4. Write the structures and physiological properties of testosterone, estrone, and estriol.
5. Discuss briefly about the factors affecting chemical shift of carbon in ^{13}C NMR spectra by giving at least one example in each case.
6. Two isomeric compounds R and S (molecular formula $\text{C}_9\text{H}_{10}\text{O}$) exhibit the following proton resonances in their ^1H NMR spectra:
Compound R: δ 2.0 (3H, s), 3.50 (2H, s) and 6.90 (4H, s).
Compound S: δ 2.68 (3H, s), 3.46 (2H, d), and 7.15 (4H, s).
Assign suitable structures to R and S.
7. Complete the following reactions:



8. Write a short on steroids and hormones?

Section 'B'

Section 'B' contains 04 long answer-type questions of 10 marks each. Learners are required to answer 02 questions only.

1. (a) Discuss the structure of Quinine. Describe the essential steps in Woodward synthesis of quinine.
(b) Give evidences in support of structure morphine.
2. Write brief on the following.
 - i. COSY
 - ii. 2D INADEQUATE spectra
 - iii. NOSY
 - iv. HETCOR Spectroscopy
3. Write down the mechanism of the following name reaction;
 - (a) Robinson- Gabriel synthesis
 - (b) Claisen rearrangement
 - (c) Dimroth Rearrangement
 - (d) Diels-Alder reaction
4. (a) What are enzymes? Describe the mechanism of Enzyme catalysis.
(b) Write down the biosynthesis of Quinoline and diterpene.

