FACULTY OF SCIENCE
M.Sc. IV Semester Examination, April/May 2013
ORGANIC CHEMISTRY
Paper – IV : Advanced Natural Products (Elective)

Time : 3 Hours] [Max. Marks : 80

SECTION – A (4x8=32 Marks)

1. a) What is the difference between specific incorporation and uniform incorporation of isotopes? Give an example to each.
   b) Explain one method of determination of bio-synthesis.

2. a) What are the by-products isolated during extract interaction of turpentine oil?
    Name and give the structure of any two.
   b) Write a short note on the medicinal use of alkaloids.

3. a) Elucidate the configuration at C-3 and C-10 in cholesterol.
    b) Convert oestradiol to oestriol.

4. a) Give the structure of chlorophyll-a.
    b) Write a note on the physiological activity of prostaglandins.

SECTION – B (4x12=48 Marks)

5. a) Explain the location of isotopic tracers in the bio-synthesis by NMR technique.
    b) How are the aromatic amino acids produced from glucose involving shikimic acid as obligatory intermediate?

OR

   c) How are the radioactive isotopic tracers are fed into the plants?
   d) What is a chalcone? How is it produced in-vivo?

(This paper contains 2 pages)
6. a) Describe the orientation of the hydrogens at C-5 and C-6 in the morphine.
   b) Draw the stereochemical structure of reserpine and give numbering to its carbons.

   OR

   c) Determine the stereochemistry of A/B ring junction in abietic acid.
   d) Describe the semi-synthesis of β-amyrin.

7. a) Formulate the Barbier-Wieland degradation of stepping down of 5β-cholanic acid.
   b) Explain the structural isomerism associated with the aldosterone.

   OR

   c) What is Blanc's rule? How is it useful in the structure determination of cholesterol?
   d) Describe the total synthesis of oestradiol.

8. a) Outline the total synthesis of PGE$_1$.
   b) Write the important chemical reactions by which the structure of rotenone can be arrived.

   OR

   c) Sketch the synthesis of haemin.
   d) Give the structure of haematinic acid, haemopyrrole, phyllopyrrole and cryptopyrrole.