

FACULTY OF SCIENCE
M.Sc. IV – Semester Examination, April / May 2014

Subject: Organic Chemistry
Paper – IV: Advanced Natural Products

Time: 3 Hours

Max.Marks: 80

Note: Answer all questions from Part-A and Part-B. Each question carries 8 marks in Part-A and 12 marks in Part-B.

PART – A (4 x 8 = 32 Marks)
[Short Answer Type]

- 1 (a) Differentiate between biosynthesis and biogenesis.
 (b) Explain the wick feeding and hydroponing feeding of labeled precursors into the plants.
- 2 (a) Explain any two colour tests of alkaloids.
 (b) Write the mechanism for the conversion of morphine to apomorphine.
- 3 (a) Convert oestrone to oestriol.
 (b) Write a short note on the classification of sex hormones.
- 4 (a) Give the mechanism for the transformation of rotenone to derrisic acid.
 (b) Explain the classification of prostaglandins.

PART – B (4 x 12 = 48 Marks)
[Essay Answer Type]

- 5 (a) Explain the location of isotopic tracers in the biosynthesis by a chemical method.
 (b) Explain the difference between the chemical synthesis and biosynthesis.
OR
 (c) How are the aromatic carboxylic acids biosynthesized involving Shikimic acid pathway.
 (d) Explain the biosynthesis of squalene epoxide starting from mevalonic acid.
- 6 (a) Prove that C/D ring junction in reserpine is cis.
 (b) Establish that the abietic acid is a hetero annular diene.
OR
 (c) Describe a method for the isolation of morphine.
 (d) Draw the structure of β -amyrin and α -amyrin and transform them into an angular pentacene.
- 7 (a) Explain the trans locking of C/D rings in cholesterol.
 (b) Describe a chemical method of conversion of cholesterol into testosterone.
OR
 (c) Sketch the total synthesis of (\pm) oestrone.
 (d) How do you prepare progesterone from cholesterol?
- 8 (a) Outline the total synthesis of PGE₂.
 (b) Give the structures of the four pyrroles obtained when Haemin is reduced with HI/AcOH and provide the synthesis of any two.
OR
 (c) Sketch the total synthesis of rotenone.
 (d) Explain the reactions of chlorophyll-a with (a) KOH and (b) (COOH)₂ in C₂H₅OH.
