

FACULTY OF SCIENCE

M.Sc. IV – Semester Examination, May / June 2017

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 (4x8 = 32 Marks)

[Short Answer Type]

- 1 a) Differentiate between absolute incorporation and specific incorporation.
b) Give the biosynthesis of any two aromatic compounds by Shikimic acid pathway.
- 2 a) Write the structures of the products of following:
 - i) Abietic acid $\xrightarrow[\Delta]{S}$?
 - ii) Reserpine $\xrightarrow[4]{LiAlH_4}$?
 b) Explain how the position of sec hydroxyl group is established in morphine.
- 3 a) Draw the stereochemical structures of
 - i) Aldosterone
 - ii) Testosterone
 b) Convert oestrone to oestradiol.
- 4 a) Classify the prostaglandins and mention their physiological activity.
b) What is the product obtained when rotenone is treated with MnO_2 /Acetone.

PART – B (4x12 = 48 Marks)

[Essay Answer Type]

- 5 a) How the position of labels are identified in labelled natural products by chemical methods.
b) How the biosynthesis of cholesterol.

OR

Discuss briefly the following:

- c) Methods of feeding labelled precursors
- d) Biosynthesis of flavanoids.

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- 6 a) Explain the following:
- Evidence for position of double bond in morphine
 - Stereochemistry of reserpine
 - Synthesis of dehydro abietic acid.

OR

- Formulate the synthesis of morphine.
- Write the stereochemical structure of β -amyryn.

- 7 a) What is Barbier-Wieland degradation? How it helped in finding position and nature of side chain in cholesterol.

- Convert cholesterol to progesterone.

OR

- Discuss briefly the following:
 - Stereochemistry of A/B ring junction in cholesterol
 - Structure determination of androsterone.

- 8 a) How the structure of PGE₂ is established?

- Formulate the synthesis of chlorophyll.

OR

- Write the structure for Haem and chlorophyll.
- Formulate the synthesis of rotenone.
