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SARDAR PATEL UNIVERSITY
M.Sc. Semester – IV (Organic Chemistry) Examination
Saturday, 1st December 2012

PS04CORC02: Natural Products

Time: 10:30 am to 01:30 pm

Total Marks: 70

Note: Right hand figures indicate marks.

Q. 1 Select the correct answer in the following. **08**

1. The reagent used in Kuhn-Roth methyl side chain determination is

a. Chromium trioxide in sulfuric acid	c. Selenium dioxide
b. Nitric acid	d. Lead tetraacetate

2. Deficiency of Vitamin B₁(thiamine) causes the disease

a. Scurvy	c. Beriberi
b. Xerophthalmia	d. Dermatitis

3. The basic heterocyclic nucleus present in Mahanimbine is

a. Quinoline	c. Phenanthrene
b. Carbazole	d. Pyrimidine

4. The methylmorphol is

a. 3-Hydroxy-4-methoxy phenanthrene	c. 1-hydroxy-2-methoxy phenanthrene
b. 3,4-Dimethoxy phenanthrene	d. 3-Methoxy-4-hydroxy phenanthrene

5. β -Eudesmol is example of

a. Monoterpenoid	c. Diterpenoid
b. Sesquiterpenoid	d. Triterpenoid

6. The correct position of double bonds in cadinene was established by

a. Campbell-Soffer	c. Semmler et al
b. Ruzicka	d. McQuillin et al

7. In the structure determination of cholesterol the Barbier-Wieland degradation is used for the determination of

a. Number of rings	c. Nature of side chain
b. Position of hydroxyl group	d. Position of angular methyl groups

8. The bile acids act as

- a. Emulsifying agents in digestion system
- b. Catalyst in Vitamin-D synthesis
- c. Growth regulating hormones
- d. Buffer for pH regulation

Q. 2 Answer the following (**Any Seven**).

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1. Show the conversion of pyridoxine into pyridoxal and pyridoxamine.
2. Write in brief the biological importance of vitamin A₁ and biotin (vitamin H).
3. Give the evidence for presence of ether linkage between C₄ and C₅ carbons of phenanthrene nucleus in morphine.
4. Give the biosynthesis of mevalonic acid-an intermediate in the biogenesis of natural products.
5. State and explain isoprene rule in terpenoids.
6. Give the evidence for trans fusion of decaline nucleus in β-eudesmol.
7. Give the synthesis of testosterone from cholesterol.
8. Write a short note on chemistry of bile acids.
9. With suitable example explain Hofmann's exhaustive methylation method.

Q. 3 A. Answer the following.

06

- (i) The sodium sulfite cleavage of vitamin B₁ results in a compound C₆H₉NOS with basic properties and a compound C₆H₉N₃O₃S with acidic properties. Discuss the structure of compound with acidic properties.
- (ii) Give the synthesis of vitamin C starting with D-glucose.

B. Discuss the structure of biotin and give its synthesis.

06

OR

B. Discuss the structure of vitamin A₁ and give its synthesis.

06

Q. 4 A. Answer the following.

06

- (i) Give the evidences to prove that the nitrogen end of the nitrogen containing bridge -CH₂-CH₂-N-CH₃ is attached at C₉ or C₁₀ of the phenanthrene ring in morphine.
- (ii) Discuss in brief uv, mass and NMR spectral properties of sceletium alkaloid A₄.

B. Give the synthesis of following alkaloids.

06

- (i) Reserpine (ii) Tylophorine

OR

B. Discuss the structure of mahanimbine and give its synthesis.

06

- Q. 5 A. Answer the following. 06
(i) Discuss Campbell and Soffer's work for establishing position of double bonds in cadinene.
(ii) The sulphur dehydrogenation of β - eudesmol gives eudalene as a product. Discuss the structure of eudalene.
B. Discuss the structure of β -carotene and give its synthesis. 06

OR

- B. (i) Give the synthesis of caryophyllene. 03
(ii) Give the biogenesis of mono and sesqui terpenoids. 03
- Q. 6 A. Discuss the position of secondary hydroxyl group and double bond in cholesterol. 06
B. (i) Give the evidences for the position of C-10 angular methyl group in cholesterol. 03
(ii) Give the synthesis of Oesterone. 03

OR

- B. Discuss the nature and position of side chain in cholesterol. 06
