Roll No.

CHE-502

Organic Chemistry

M. Sc. CHEMISTRY (MSCCH-12/13/16)

First Year, Examination, 2017

Time : 3 Hours

Max. Marks : 80

Note: This paper is of eighty (80) marks containing three (03) Sections A, B and C. Attempt the questions contained in these Sections according to the detailed instructions given therein.

Section-A

(Long Answer Type Questions)

- **Note :** Section 'A' contains four (04) long answer type questions of nineteen (19) marks each. Learners are required to answer *two* (02) questions only.
- What are terpenoids ? How are they classified ? Discuss biosynthetic pathways of terpenoids with examples.
- 2. Describe in brief the following : 4.75 each
 - (i) Baker and Nathan effect
 - (ii) Synthesis of β -Carotene
 - (iii) Resolution of racemic mixture
 - (iv) Synthesis and uses of quinoline
- 3. Discuss briefly any *four* of the following : 4.75 each
 - (i) Concept of aromaticity in bezenoid and nonbenzenoid molecules with examples.

- (ii) Elimination *vs*. Nucleophilic competitive reaction in carbocations
- (iii) Absolute and relative configuration
- (iv) Aromatic vs. Aliphatic nucleophilic reactions
- (v) Glucosazones
- 4. (i) Write the mechanism of hydroboration-oxidation reaction. 6
 - (ii) What is the stereochemical relationship between each of pairs ? 8



(iii) Predicts the products from the following reactions : $2\frac{1}{2}$ each NH_2



Section-B

(Short Answer Type Questions)

- **Note :** Section 'B' contains eight (08) short answer type questions of eight (08) marks each. Learners are required to answer *four* (04) questions only.
- 1. Discuss the following with *one* example in each case :

2 each

- (i) Plane of symmetry
- (ii) Centre of symmetry
- (iii) Alternating axis of symmetry
- (iv) Atropisomerism
- 2. Explain with example various nucleophilic reactions with examples and draw the energy profile diagram of these reactions. 8
- 3. How will you convert the following ? 8
 - (i) Pyridine into piperidine

(ii) Furan into furfural

(iii) Acetylene into pyridine

- (iv) Pyrrole into pyrrolidine
- 4. (a) Explain why [10]-annulene are not aromatic in character but [18]-annulene is aromatic. 4
 - (b) Discuss the medicinal and industrial uses of terpenes with examples. 4
- 5. Distinguish between each of the following pairs of terms : 2 each
 - (i) Aldose and ketose
 - (ii) Epimer and diastereomers
 - (iii) Epimers and annomers
 - (iv) D & L-sugar
- 6. Write short notes on the following : 2 each
 - (i) Mutarotation
 - (ii) Absolute configuration in carbohydrates
 - (iii) Hoffman degradation
 - (iv) Anchimeric assistance
- 7. Discuss synthesis and uses of the following : 4 each
 - (i) Pyrazine
 - (ii) Oxirane
- Explain Kiliani's synthesis of a higher monosaccharide from the next lower one and Wohl's method for the conversion of a higher one into lower one.

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Section-C

(Objective Type Questions)

Note : Section 'C' contains ten (10) objective type questions of one (01) mark each. All the questions of this section are compulsory.

Choose the correct options :

1. Correct order of stability is :



- (iii) c > b > a > d
- (iv) b > c > d > a
- 2. In diterpenes the no. of C_5H_8 unites is :
 - (i) Two
 - (ii) Three
 - (iii) Four
 - (iv) One
- 3. Which of the following is an example of pyridine pyrrolidine alkaloid ?
 - (i) Piperine
 - (ii) Nicotine
 - (iii) Ephedrine
 - (iv) Papaverine

- [6]
- 4. Nomenclature of the following compounds :



- (iv) Von Braun method
- 6. What is the structure of pryazine ?



- 7. Which statement is true for cellulose ?
 - (i) It is a storage polysaccharide
 - (ii) It has branched structure
 - (iii) It has linear structure
 - (iv) It is a polymer of galactose
- 8. Which among the following compounds is aromatic ?



- 9. An S_N^2 reaction of an asymmetric carbon of a compound always gives :
 - (i) An enantimer of substrate
 - (ii) A product with opposite optical rotation
 - (iii) A mixture of diastereoisomer
 - (iv) A single stereoisomer
- 10. The preferred conformation of cis-1,3dimethylcyclohexane is :



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