



M.Sc. (Final)

Term End Examination, 2017-18

# CHEMISTRY

Group - B (II)

## Paper - IV

Physical Organic Chemistry and  
Heterocyclic Chemistry

*Time : Three Hours]                      [Maximum Marks : 100*  
*[Minimum Pass Marks : 36*

**Note** : Answer **five** questions in all by selecting at least **two** questions from each Section. The figures in the right-hand margin indicate marks.

## Section-A

1. (a) Explain the Huckel Molecular Orbital theory with the example of Ethene, allyl and butadiene.  
(b) Explain Hammond's postulate. 10+10

**( 2 )**

2. Explain any **two** questions of the following :10+10
- (a) Effect of solvation on reaction rate
  - (b) Classification of solvents
  - (c) Hard and soft acids and bases
  - (d) Nucleophilic and Electrophilic catalysis
3. Explain the various types of steric strain and their influence on reactivity.
4. Explain any **two** of the following : 10+10
- (a) Curtin-Hammett Principle
  - (b) Isotope effect
  - (c) Structural effects on rates and selectivity
  - (d) Nucleofugacity
5. Factors affecting barrier heights in addition, regioselectivity in radical reactions. 20

**Section-B**

6. (a) Explain the systematic Nomenclature for monocyclic heterocycles.
- (b) Conformation of six membered heterocycles with reference to molecular geometry. 10+10
7. Explain any **two** of the following : 10+10
- (a) Attractive interaction—hydrogen bonding

( 3 )

- (b) Two cyclization reaction for the synthesis of heterocycles
  - (c) Reaction of oxiranes
  - (d) Synthesis of thietanes
8. Synthesis and reactions of Benzopyrroles. 20
9. Write down the synthesis and reactions of chromones and pyrones. 20
10. Give the synthesis of any **two** of the following : 10+10
- (a) Azepines
  - (b) Triazines
  - (c) Azocines
  - (d) Benzothiophenes
- \_\_\_\_\_