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Z–2972

M. Phil. EXAMINATION, 2016

CHEMISTRY

Paper Second

(Medicinal and Physical Organic Chemistry)

Time : Three Hours] [*Maximum Marks : 100*

Note : Attempt *five* questions in all, selecting *one* question from each Unit.

Unit—I

1. (a) Define and explain pharmacophore. Write the salient features of receptor sites. 10

   (b) Discuss mechanism of transport of drug molecules through membrane. 10

2. (a) Describe the identification of active part and drug likeness. 10

   (b) What are Lipids ? Discuss the common type of membrane lipids and their biological importance. 10

Unit—II

3. (a) Describe different pathways that are involved in drug metabolism reactions. 10

(b) Discuss the drug metabolism of oxidation reaction of aliphatic and aromatic hydrocarbons. 10

4. (a) Describe hydrolytic reactions of esters and amides that are used in biotransformation of drugs. 10

(b) Discuss with suitable examples conjugation reactions involved in drug metabolism. 10

Unit—III

5. (a) What do you understand by CMC ? Describe one method for the determination of CMC. Discuss the effects of additives on the CMC of surfactants. 10

(b) Discuss any *two* of the following : 10

(i) Classification of surfactants.

(ii) Micelles and their structure.

(iii) Micellar catalysis.

6. (a) Explain thermodynamics of micellization. Discuss phase separation and mass action model in brief. 10

(b) Describe mechanism of micellar effects in hydrophobic interaction of proteins. 10

Unit—IV

7. (a) Discuss Hammett equation. Give its important applications. 12

(b) Write short notes on any *two* of the following : 8

(i) The Taft model

(ii) Tunneling effect

(iii) Heavy atom isotope effect

8. (a) What is kinetic isotope effect ? Give the uses of isotope effects in elucidating the following mechanisms : 12

   (i) Elimination mechanism

   (ii) Aromatic nitration

   (iii) Decarboxylation

   (iv) Transition state geometry

   (b) Discuss briefly solvent effects and solvent isotope effects. 8

Unit—V

9. (a) Discuss the classification of solvent and describe the effects of solvation on reaction rates and equilibria. 12

   (b) Write importance of solvation scales in mechanistic studies. 8

10. (a) What are empirical solvent parameters ? Discuss Grunwald-Winstein parameter and Koppel-Palm treatment. 12

   (b) Write a note on spectroscopic parameters for solvation. 8