

## BP301T. PHARMACEUTICAL ORGANIC CHEMISTRY –II (Theory)

45 Hours

### Course Content:

General methods of preparation and reactions of compounds superscripted with asterisk (\*) to be explained.

To emphasize on definition, types, classification, principles/mechanisms, applications, examples and differences

#### Unit-I

10 Hours

##### Benzene and its derivatives

- A. Analytical, synthetic and other evidences in the derivation of structure of benzene, Orbital picture, resonance in benzene, aromatic characters, Huckel's rule.
- B. Reactions of benzene - nitration, sulphonation, halogenation- reactivity, Friedel Crafts alkylation-reactivity, limitations, Friedel Crafts acylation.
- C. Substituents, effect of substituents on reactivity and orientation of mono substituted benzene compounds towards electrophilic substitution reaction.
- D. Structure and uses of DDT, Saccharin, BHC and Chloramine T.

#### Unit-II

10 Hours

**Phenols\*** - Acidity of phenols, effect of substituents on acidity, qualitative tests, Structure and uses of phenol, cresols, resorcinol, naphthols.

**Aromatic Amines\*** - Basicity of amines, effect of substituents on basicity, and synthetic uses of aryl diazonium salts.

**Aromatic Acids\***– Acidity, effect of substituents on acidity and important reactions of benzoic acid.

#### Unit-III

10 Hours

##### Fats and Oils

Fatty acids – reactions.

Hydrolysis, Hydrogenation, Saponification and Rancidity of oils, Drying oils.

Analytical constants– Acid value, Saponification value, Ester value, Iodine value, Acetyl value, Reichert Meissl (RM) value– significance and principle involved in their determination.

#### Unit-IV

08 Hours

**Polynuclear Hydrocarbons:** Synthesis, reactions.

Structure and medicinal uses of Naphthalene, Phenanthrene, Anthracene, Diphenylmethane, Triphenylmethane and their derivatives.

**Unit-V****07 Hours****Cycloalkanes\***

Stabilities – Baeyer's strain theory, limitation of Baeyer's strain theory, Coulson and Moffitt's modification, Sachse Mohr's theory (Theory of strainless rings), reactions of cyclopropane and cyclobutane only.

## BP305P. PHARMACEUTICAL ORGANIC CHEMISTRY -II (Practical)

4 Hrs/week

1. Experiments involving laboratory techniques:
  - Recrystallization.
  - Steam distillation.
2. Determination of following oil values (including standardization of reagents):
  - Acid value.
  - Saponification value.
  - Iodine value.
3. **Preparation of compounds**
  - Benzanilide/Phenyl benzoate/Acetanilide from Aniline/Phenol/Aniline by acylation reaction.
  - 2,4,6-tribromo aniline/para bromo acetanilide from Aniline.
  - Acetanilide by halogenation (Bromination) reaction.
  - 5-nitrosalicylic acid/meta di-nitrobenzene from salicylic acid/ nitro benzene by nitration reaction.
  - Benzoic acid from benzyl chloride by oxidation reaction.
  - Benzoic acid/ Salicylic acid from alkyl benzoate/ alkyl salicylate by hydrolysis reaction.
  - 1-Phenyl azo-2-naphthol from Aniline by diazotization and coupling reactions.
  - Benzil from benzoin by oxidation reaction.
  - Dibenzal acetone from benzaldehyde by Claisen-Schmidt reaction.
  - Cinnamic acid from benzaldehyde by Perkin reaction.
  - *p*-Iodo benzoic acid from *p*-amino benzoic acid.

### Recommended Books (Latest Editions)

- Organic Chemistry by Morrison R.T., Boyd R.N. and Bhattacharjee, S.K. Dorling Kindersley (India) Pvt. Ltd. (Pearson Education Ltd.), New Delhi.
- Organic Chemistry by Jonathan Clayden, Nick G. S. Warren. Oxford University Press, Oxford.
- Organic Chemistry by G. Marc Loudon, Oxford University Press, Oxford.
- Organic Chemistry by Francis A. Carey and Robert M. Giuliano, Tata McGraw Hill Publishing Company Ltd., New Delhi.
- Strategic Applications of Named Reactions in Organic Chemistry by Laszlo Kurti and Barbara Czako, Elsevier Academic Press.
- Organic Chemistry by I.L. Finar, Volume-I, Pearson Education Ltd, New Delhi.

- Elementary Practical Organic Chemistry by Vogel A.I., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education Ltd.), New Delhi.
- Practical Organic Chemistry by Mann F.G, and Saunders B.C., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education Ltd.), New Delhi.
- Introduction to Organic Laboratory Techniques by Pavia, Lampman and Kriz, Cengage Learning, Delhi.
- Reaction and Reaction Mechanism by Ahluwalia/Chatwal, Narosa Publishing House, New Delhi.
- A Guidebook to Mechanism in Organic Chemistry by Sykes P., Longman Group Ltd, London.
- Organic Chemistry by Jain M.K., Sohan Lal Nagin Chand & Co, New Delhi.
- Textbook of Organic Chemistry by P.L. Soni, Sultan Chand & sons, New Delhi.