

APRIL - 2001

[KD 702]

Sub. Code : 4162

FIRST B.Pharmacy DEGREE EXAMINATION.

(Revised Regulations)

Paper II — PHARMACEUTICAL ORGANIC
CHEMISTRY

Time : Three hours Maximum : 90 marks
Two and a half hours Sec. A & Sec. B : 60 marks
for Sec. A & Sec. B Section C : 30 marks

Answer Sections A and B in the same Answer Book.

Answer Section C in the answer sheet provided.

SECTION A — (2 × 15 = 30 marks)

Answer any TWO questions.

1. (a) Define and classify Hydrogen bonding. How does it influence physical properties, boiling point and solubility.

(b) Explain the terms Atomic and Molecular orbitals.

(c) Which of the following are associated liquids? Draw the structure to show the hydrogen bonding

- (i) CH_3OCH_3
- (ii) CH_3NH_2
- (iii) CH_3OH
- (iv) $(\text{CH}_3)_2\text{NH}$.

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2. (a) Discuss the fate and stability of carbonium ions.
- (b) Discuss the stability and ease of formation of free Radicals.
- (c) Explain Ozonolysis.
3. (a) Explain Markownikoff's addition and Anti Markownikoff's addition with example.
- (b) Addition of HCl to 3 methyl-1-butene yields a mixture of two alkyl chlorides. How is each formed? Give detailed equation.
- (c) Write the tests for purity and assay of liquid paraffin.
4. (a) Explain which carboxylic acid can be prepared from *p*-bromotoluene (i) by direct oxidation (ii) by free radical chlorination followed by the nitrile synthesis.
- (b) Explain the acidity of carboxylic acid in terms of its resonance stabilized anions to that of alcohol.
- (c) Explain why acyl halides are more reactive than alkyl halides towards nucleophilic substitution reaction.

SECTION B — (6 × 5 = 30 marks)

Answer any SIX questions.

5. Outline all steps for the synthesis of 3,5-dinitrobenzoic acid from toluene.
6. Explain the Bayer's Strain theory.

7. Describe the synthesis of carboxylic acids and phenols from Diazonium salts with examples.
8. Explain the aldol and crossed aldol condensations.
9. Describe the Friedel and Crafts alkylation mechanism with suitable examples.
10. Give the preparation and assay of Aspirin and how the salicylate in Aspirin is tested.
11. Give the method of preparation and uses of (a) Mephesisin (b) Sulphanilamide.
12. Comment on the basicity of Amines and give the general preparation of Amines.
13. Explain the effect of halogen on electrophilic aromatic substitution.

NOVEMBER - 2001

[KE 702]

Sub. Code : 4162

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(Revised Regulations)

Paper II — PHARMACEUTICAL ORGANIC
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Time : Three hours Maximum : 90 marks
Two and a half hours Sec. A & Sec. B : 60 marks
for Sec. A and Sec. B Section C : 30 marks

Answer Section A and Section B in same Answer Book
and Section C in the answer sheet provided.

SECTION A — (2 × 15 = 30 marks)

Answer any TWO questions.

1. Describe the general methods for the preparation of aldehydes and ketones. Compare and contrast the properties of these two groups of compounds.
2. Explain the structural formula of ethylene in terms of its orbital picture. Outline the various methods for the preparation of alkenes and list the various addition reactions of alkenes. Explain the mechanism of electrophilic addition to alkenes.

3. Explain the preparation and uses of the following :

- (a) Iodoform
- (b) Aspirin
- (c) Vanillin
- (d) Amphetamine
- (e) Sulphanilamide.

4. Describe the concept and rules of resonance in organic compounds. Discuss its application to the structure of benzene. List a few typical reactions characteristic of aromatic rings.

SECTION B — (6 × 5 = 30 marks)

Answer any SIX questions.

5. Explain the mechanism of halogenation of alkanes. Give evidence in support of the suggested mechanism.
6. Explain why S_N^1 type reactions show racemisation and rearrangement while S_N^2 type reactions show inversion but the rearrangement.

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7. Comment on the fact that nitration of chlorobenzene is a slower process compared to nitration of benzene and the products are ortho and para nitro chlorobenzenes.

8. How are the following prepared from acetic acid :

- (a) Trichloro acetic acid
- (b) Acetamide
- (c) Acetyl chloride
- (d) Methyl amine
- (e) Glycine.

9. Explain the reaction of nitrous acid with aromatic primary, secondary and tertiary amines.

10. Describe the preparation of succinic acid and barbituric acid starting from diethyl malonate.

11. How are the following conversions affected?

- (a) 1-propanol into 2-propanol
- (b) Ethanol into propanol.

12. How can phenol be converted into salicylaldehyde? Discuss the mechanism of this reaction.

13. Why is aniline less basic than ammonia? Show how it can be converted into 1, 2, 3-tribromo benzene.

MARCH - 2002

[KG 702]

Sub. Code : 4162

FIRST B.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

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CHEMISTRY

Time : Three hours Maximum : 90 marks
Two and a half hours Sec. A & Sec. B : 60 marks
for Sec. A & Sec. B Section C : 30 marks

Answer Sections A and B in same Answer Books.

Answer Section C in the answer Sheet provided.

SECTION A — (2 × 15 = 30 marks)

Answer any TWO questions.

1. Outline any five methods for the preparation of haloalkanes. Describe the mechanisms for the substitution reactions undergone by haloalkanes and discuss the evidence in support of each mechanism.
2. (a) Describe any three examples for the nucleophilic addition to carbonyl compounds. Explain why aldehydes are more reactive in addition reactions than ketones.
(b) Explain the mechanisms of haloform reaction and aldol condensation.

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3. (a) What is meant by aromaticity? Explain why benzene is considered to be a perfect specimen of aromatic character.

(b) Outline the mechanism for nitration of benzene. Discuss the effect of halogens on the reactivity and orientation in this reaction.

4. (a) How are amines classified? Give examples. Explain the distinguishing tests for the different classes of amines.

(b) Explain the reactions involved in the conversion of aniline into

- (i) *m*-nitroaniline
- (ii) *p*-bromoaniline
- (iii) Sulphanilic acid
- (iv) *p*-amino azobenzene
- (v) Benzanilide.

SECTION B — (6 × 5 = 30 marks)

Answer any SIX questions.

5. Discuss the method of preparation and one synthetic application of malonic ester.

6. Compare the synthetic utility of hydroboration - oxidation and alkoxy mercuration and demercuration methods in the preparation of alcohols.

7. Outline the method of preparation and explain the acidity of phenol. Show why phenol is more acidic than benzyl alcohol.

8. Explain the mechanism of halogenation of alkanes. Discuss the selectivity of halogens in this reaction.

9. Explain any four general methods for the preparation of carboxylic acids.

10. Describe the preparation and medicinal uses of aspirin and sulphanilamide.

11. Discuss the process of ozonolysis and its diagnostic significance.

12. Explain Bayer's strain theory.

13. Explain the preparation and synthetic uses of aryl diazonium compounds.

SEPTEMBER - 2002

[KH 702]

Sub. Code : 4162

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CHEMISTRY

Time : Three hours Maximum : 90 marks

Two and a half hours Sec. A & Sec. B : 60 marks

for Sec. A and Sec. B Section C : 30 marks

Answer Sections A and B in the **SAME** Answer Book.

Answer Section C in the Answer Sheet provided.

SECTION A — (2 × 15 = 30 marks)

Answer any TWO questions.

1. (a) Explain the following reactions :

- (i) Rosenmund's reaction
- (ii) Cannizzaro reaction
- (iii) Meerwein Ponndorf reduction.

(b) Give the methods of preparation of phenol.

2. (a) Write the methods of preparation of Alcohol.

(b) Give the identification tests for alcohol.

(c) Write the principle involved in the assay of Chlorbutol and Dimercaprol.

3. (a) Give the methods of synthesis of Propene.

(b) Define Markonikov's rule with example.

(c) Write notes on free radical chain reaction.

4. (a) How do you distinguish the different classes of amine? Explain with example.

(b) What happens when

(i) Aniline is treated with nitrous acid

(ii) Aniline is treated with chloroform in the presence of KOH

(iii) Aniline is oxidised in the presence of $K_2Cr_2O_7$ and H_2SO_4

(iv) Aniline is treated with $COCl_2$

(v) Aniline is treated with diazonium salt in the presence of NaOH at $0^\circ C$.

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SECTION B — (6 × 5 = 30 marks)

Answer any SIX questions.

5. Discuss the preparation and medicinal uses of paraldehyde and Hexamine.
6. Explain the following reactions :
 - (a) Kolbe's reaction
 - (b) Williamson synthesis.
7. Write notes on Bayer's strain theory.
8. Write briefly about 'peroxide effect' with example.
9. Explain Electrophilic aromatic substitution method with example.
10. Discuss the principle involved in the assay of Benzyl benzoate and sulphanilamide and mention their medicinal uses.
11. Explain the nucleophilic addition reaction with example.

12. Write any four methods for the preparation of carboxylic acids.

13. Discuss the method of preparation of malonic ester and mention its synthetic application.

APRIL - 2003

[KI 702]

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FIRST YEAR B.Pharm. DEGREE EXAMINATION.

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CHEMISTRY

Time : Three hours Maximum : 90 marks

Two and a half hours Sec. A & Sec. B : 60 marks
for Sec. A and Sec. B Section C : 30 marks

Half an hour for Sec. C

Answer Section A and B in the **SAME** Answer Book and
Section C in the Answer Sheet provided.

SECTION A — (2 × 15 = 30 marks)

Answer any TWO questions.

1. Write notes on the synthetic methods, reactions and identification tests for alkenes.
2. Give a comparative account of the mechanism, reactivity, orientation, effect of solvent and effect of base concentration of SN_1 and SN_2 reactions.

3. (a) Give an account on the synthetic uses of melonic ester.

(b) What are carbonium ions? Explain the structure, types and relative stability of carbonium ions.

4. Write notes on the mechanism of electrophillic aromatic substitution with example and effect of substituent on the reactivity and orientation on electrophillic aromatic substitution.

SECTION B — (6 × 5 = 30 marks)

Answer any SIX questions.

5. Explain polar bonds, non-polar bonds and dipole moment.

6. Write notes on Markovnikov's rule and reason for such orientation.

7. Explain ozonolysis and its importance in the determination of molecular structure.

8. Write notes on acidity of phenols and effect of substituent on the acidity of phenols.

9. Write notes on resonance and its importance.

10. Explain the preparation, assay and uses of Aspirin.

11. Explain the mechanism of

(a) Cannizaro reaction

(b) Aldol condensation.

12. Explain the mechanism of halogenation of alkane including reactivity and orientation.

13. How will you effect the following conversions :

(a) Benzene to Benzoic acid

(b) Benzene to para bromoaniline.

[KJ 702]

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FIRST YEAR B.Pharm. DEGREE EXAMINATION.

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CHEMISTRY

Time : Three hours Maximum : 90 marks

Two hours and forty minutes Sec. A & Sec. B : 70 marks
for Sec. A and Sec. B Section C : 20 marks

Twenty minutes for Sec. C

Answer Sections A and B in the **SAME** Answer Book
and Section C in the Answer Sheet provided.

SECTION A — (2 × 15 = 30 marks)

Answer any TWO questions.

Each question carries 15 marks.

1. What is S_N^2 reaction? Discuss the mechanism of S_N^2 reaction with the help of one suitable example? Give proof for the mechanism.

2. Mention any two general methods of synthesizing alcohols along with mechanism? How will you distinguish between primary, secondary and tertiary alcohols with the help of a chemical test?

3. State and explain Markovnikoff's Rule and Peroxide effect with the help of suitable example. Give the mechanism also. Explain Diels Alder reaction with a suitable example.

4. Define the term 'Hybridization'. With one example for each class, explain sp^1 , sp^2 and sp^3 hybridizations.

SECTION B — (8 × 5 = 40 marks)

Answer any EIGHT questions.

5. Explain the mechanism of Nitration of Benzene.

6. What is Grignard's reagent? How is it prepared? Using Grignard's reagent, how many different classes of compounds can be synthesized? Give the synthesis of any one of them.

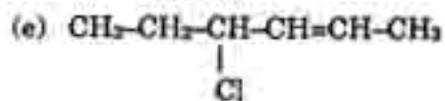
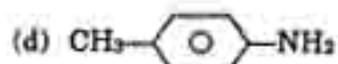
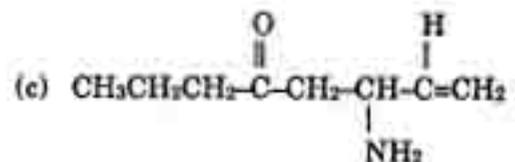
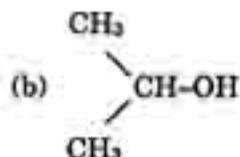
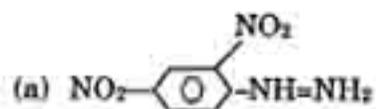
7. Give the mechanism of E_1 reaction with the help of one example.

8. Give the synthesis and application of Malonic ester.

9. Explain the mechanism of Reimer-Tiemann reaction.

10. Using diazonium synthesis, how will you convert Benzene to 2, 6-dibromotoluene.

11. Give the IUPAC names of



12. Discuss the stability of conjugated dienes with example.

13. Give the assay and medicinal uses of (a) Aspirin (b) Carbomal.

14. Give the general method of preparation and any two typical reactions of monocarboxylic acid.

15. Give the synthesis and medicinal uses of (a) Saccharin (b) Chloramine T.

16. Explain Bayer's strain theory and mention its limitations.

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[KK 702]

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Paper II — PHARMACEUTICAL ORGANIC
CHEMISTRY

Time : Three hours

Maximum : 90 marks

Sec. A & B : Two hours and

Sec. A & B : 70 marks

forty minutes

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

Answer Section A and B in **SAME** Answer Book and
M.C.Q. in the answer sheet provided.

SECTION A — (2 × 15 = 30 marks)

Answer any **TWO** questions.

1. (a) Explain various types of hybridization in carbon compounds with example. Mention the reasons for hybridization.

(b) What do you mean by hydrogen bonding? Explain intermolecular and intramolecular hydrogen bonding. Mention their importance.

2. What are alcohols? How are they classified? Write notes on the synthetic methods and reactions of alcohols.

3. (a) Give an account on the synthetic applications of acetoacetic ester.

(b) Write notes on the reactions of diazonium salts.

4. (a) Write notes on the structure, types and stability of free radicals and explain any one reaction involving free radical.

(b) Give an account on the reactions of carboxylic acids.

SECTION B — (8 × 5 = 40 marks)

Answer any EIGHT questions.

5. Explain the formation, nature and stability of Pi bond with suitable example.

6. Write the chemical nature, use and assay of ichthammol.

7. What is peroxide effect? Explain the reason for peroxide effect.

8. Explain Tautomerism with example.

9. Explain the electrophilic addition reaction in conjugated diene.

10. Write notes on Bayer's strain theory.

11. Write any three reactions of Benzene.

12. Explain the reaction mechanism, reactivity and orientation of E₁ reaction.

13. Write notes on the basicity and effect of substituents on the basicity of amines.

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Time : Three hours Maximum : 90 marks

Two hours and forty minutes Sec. A & Sec. B : 70 marks
for Sec. A and Sec. B

Twenty minutes for M.C.Q. M.C.Q. : 20 marks

Answer Sections A and B in the **SAME** Answer Book.

SECTION A — (2 × 15 = 30 marks)

Answer any TWO questions.

1. Describe the general methods of the preparation and reactions of alcohols. How does hydrogen bonding influences the physical properties of alcohols?
2. Write briefly on :
 - (a) Nucleophilic substitution reactions
 - (b) Elimination reactions.

3. Explain the preparations and uses of the following :

- (a) Sulphanilamide
- (b) Dimecraprol
- (c) Chloralhydrate
- (d) Lopanoic acid.

4. Write a note on :

- (a) Bayer's strain theory
- (b) Markovnikoff's and peroxide effect.

SECTION B — (8 × 5 = 40 marks)

Answer any EIGHT questions.

5. Define the term "Aromaticity" discuss the modern theory of aromaticity making a special mention of Huckel rule.

6. Phenols are acidic in character. Explain in detail.

7. How are the following conversions done?

- (a) Aniline to P-bromoacetamide
- (b) Salicylaldehyde from phenol.

8. Write general methods of preparation of carboxylic acids.

9. Write briefly on diazonium salts.

10. Explain the following with suitable examples :

- (a) Dienes
- (b) Polarity of bond.

11. Write preparation test for purity and uses of

- (a) Chloramine
- (b) Amphetamine.

12. Write the assay and uses of

- (a) Hexamine
- (b) Dichloramine "T".

13. Give the method of preparation and uses of Ethers.

14. Write notes on basicity and effect of substituents on the basicity of amines.