[KV 804] **SEPTEMBER 2009** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

(Regulations 2008-2009)

(Candidates admitted from 2008-2009 onwards)

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 70 marks**

Answer ALL questions

I. Elaborate on: **(2 x 20 = 40)**

1. a) Explain the nucleophilic substitution reactions with suitable examples.

   b) Add a note on mechanisms and kinetics involved in SN^1 and SN^2 reactions.

2. Explain the mechanisms of following name reactions.

   a) Benzoin condensation.

   b) Wittig reaction.

   c) Cannizaro reaction.

   d) Kolh's reaction.

II. Write notes on: **(6 x 5 = 30)**

1. Preparation, tests for purity, assay and uses of aspirin.
2. Explain the reaction mechanisms of sandmeyer's reduction with suitable examples.
3. Explain the bimolecular displacement mechanism for nucleophilic aromatic substitution with suitable examples.
4. Explain the conversion of acid to acid chloride and aid to esters with suitable examples.
5. Describe the effect of substituent groups on aromatic nucleus.
6. Outline any two methods of preparation of ketones.

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[KW 804] **MARCH 2010** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

(Regulations 2008-2009)

(Candidates admitted from 2008-2009 onwards)

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 70 marks**

Answer ALL questions

I. Elaborate on: **(2 x 20 = 40)**

1. Explain the preparation of alcohol with special reference to gniguard synthesis, reduction of carbonyl compounds, acids and esters.

2. Explain the mechanisms of following name reactions.

   a) Claisen condensation.

   b) Knorvenagel reaction.

   c) Michael addition.

   d) Perkin condensation.

II. Write notes on: **(6 x 5 = 30)**

1. Explain fries rearrangement and hofmann rearrangement.
2. Preparation, tests for purity, assay and uses of methyl salicylate.
3. Explain the diazotization and coupling reactions of amioes.
4. Explain the 1,2 addition and 1,4 addition reactions of conjugated dienes.
5. Outline the important chemical properties of aldehydes.
6. What are cycloalkanes? Give egs. How the cycloalkanes are prepared?

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[KX 804] **SEPTEMBER 2010** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

(Regulations 2008-2009)

(Candidates admitted from 2008-2009 onwards)

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 70 marks**

Answer ALL questions

I. Elaborate on: **(2 x 20 = 40)**

1. a) Write the Mechanism, reactivity, orientation of aromatic electrophilic substitution reaction with suitable examples.

   b) Explain briefly about hybridization.

2. a) Why are aldehydes more reactive than ketone?
   Give an account of the nucleophilic additions of aldehyde with the help of general mechanism.

   b) What are Organometallic compounds?
   How they are prepared?
   Give its synthetic applications.

II. Write notes on: **(6 x 5 = 30)**

1. Give the general methods of preparations of alcohols with examples?
   How will you differentiate between 1º, 2º, 3º alcohols?

2. Explain the following reactions:
   i) Cannizaro reaction.
   ii) Diel's Alder reaction.

3. Give the preparations of Ethers by Williamson's synthesis.

4. Add a note on Isomerism.

5. Explain Bayer's Strain Theory.

6. Add a note on Free Radicals.

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[KY 804] **MAY 2011** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

(Regulations 2008-2009)

(Candidates admitted from 2008-2009 onwards)

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 70 marks**

Answer ALL questions

I. Elaborate on: **(2 x 20 = 40)**

1. Describe the two mechanisms of aliphatic nucleophilic substitution reactions. Compare and contrast these two reactions in detail.
2. Describe in detail free radical halogenation of methane explaining the thermodynamics of the reaction with respect to the halogens: F, Cl, Br, & I.

II. Write notes on: **(6 x 5 = 30)**

1. Preparation, tests for purity, assay, and uses of Aspirin.
2. Aldol condensation and cyanohydrin reaction of aldehydes.
3. Explain Sandmeyer’s reaction with suitable examples.
4. Two methods of preparations of aldehydes.
5. Explain Schotten-Bauman reaction.
6. Write a note on the advantages of Friedal Crafts Acylation over Alkylation.

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[KZ 804] **OCTOBER 2011** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 100 marks**

Answer ALL questions in the same order.

I. Elaborate on :	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. a) Define Electrophilic aromatic substitution reaction. Explain the mechanism of nitration, sulphonation, halogenation and Friedel craft's alkylation reactions with examples.	17	40 min.	20
b) Write a note on activating and deactivating O, P, and M directing groups.			
2. a) Compare aliphatic nucleophilic bimolecular and unimolecular reaction. (SN_2 vs SN_1).	17	40 min.	20
b) Explain the mechanism and kinetics of 1, 2 Elimination reactions. (E_2 and E_1).			
II. Write notes on :			
1. Write a note on Markownikoff's rule and Peroxide effect.	4	10 min.	6
2. Explain about electrophilic addition of conjugated dienes. (1, 2 versus 1, 4 addition).	4	10 min.	6
3. Write about the mechanism of Cannizaro's reaction withexample.	4	10 min.	6
4. Define polarity of molecules and intermolecular forces with examples.	4	10 min.	6
5. Explain Bayer's strain theory with its merits and limitations.	4	10 min.	6
6. Explain Kolbe's reaction and Reimer -Tiemann's reaction.	4	10 min.	6
7. Write a note on allyl radical as a resonance hybrid.	4	10 min.	6
8. Write a note on oxidation-reduction reactions with examples.	4	10 min.	6
9. Give an example for free radical halogenation of alkenes with respect to carbon – carbon double bond acting as substituent.	4	10 min.	6
10. Define orientation, reactivity and stability.	4	10 min.	6

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[LA 804] **APRIL 2012** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 100 marks**

Answer ALL questions in the same order.

I. Elaborate on :	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. a) Elaborate the mechanism , kinetic and stereochemistry of aliphatic nucleophilic Substitution (SN^1 and SN^2) reaction.			
b) Explain about the role of phase transfer catalysis in substitution reaction.	17	40 min.	20
2. a) Illustrate about the Kinetic, mechanism and isotopic effect of E1and E2 reactions.			
b) Add a note on dehydration of acid catalysis.	17	40 min.	20

II. Write notes on :

1. Give an account of acid and base on the basis of Lewis theories.	4	10 min.	6
2. Preparation, test for purity, assay and uses of vanillin.	4	10 min.	6
3. Explain the mechanism of halogenations of alkanes. Give the evidence for the same.	4	10 min.	6
4. Outline any two methods of conversion of acids to acid chloride and amide.	4	10 min.	6
5. Discuss the mechanism and synthetic uses of benzoin condensation reaction.	4	10 min.	6
6. Describe the preparation methods for esters.	4	10 min.	6
7. Outline briefly about Bayer strain theory.	4	10 min.	6
8. Discuss the mechanism and synthetic uses of witting reaction.	4	10 min.	6
9. Write a note on Diels alder reaction.	4	10 min.	6
10. Preparation, test for purity, assay and uses of Aspirin.	4	10 min.	6

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[LB 804] **OCTOBER 2012** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 100 marks**

Answer ALL questions in the same order.

I. Elaborate on :	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. Explain the mechanism of Nucleophilic aromatic substitution reactions, orientation and reactivity of benzene.	17	40 min.	20
2. Give the reactions of alkenes.	17	40 min.	20
II. Write notes on :			
1. Phase transfer catalysis.	4	10 min.	6
2. SN1 vs. SN_2.	4	10 min.	6
3. Write the preparation of alkyl halides.	4	10 min.	6
4. Fries rearrangement.	4	10 min.	6
5. Give the addition reactions of conjugated dienes.	4	10 min.	6
6. Reformatsky reaction.	4	10 min.	6
7. Explain peroxide effect.	4	10 min.	6
8. 4n+2 rule.	4	10 min.	6
9. Sandmeyer reaction.	4	10 min.	6
10. Write the preparations of Carboxylic acids .	4	10 min.	6

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[LC 804] **APRIL 2013** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 100 marks**

Answer All questions

I. Elaborate on: **(2 x 20 = 40)**

1. a) Define elimination reaction.
   Explain about its Kinetic, mechanism and isotopic effect of E1and E2 reactions.

   b) Add a note on dehydration of acid catalysis.

2. a) Write the Mechanism, reactivity, orientation of aromatic electrophilic substitution reaction with suitable examples.

   b) Explain about the resonance stabilization of benzyl radical.

II. Write notes on: **(10 x 6 = 60)**

1. Preparation, test for purity, assay and uses of methyl salicylate.
2. Explain about preparation methods of free radicals.
3. Outline briefly about Bayer strain theory.
4. Discuss the mechanism and synthetic uses of Hoffman rearrangement reaction.
5. Describe the preparation methods for amide.
6. Preparation, test for purity, assay and uses of Chlorbutol.
7. Write notes on Inter molecular forces.
8. Give the mechanism for nitration and sulphonation reaction.
9. Explain the preparation methods and synthetic uses of diazonium salts.
10. Discuss the mechanism and synthetic uses of Reformatsky reaction.

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[LD 804] **OCTOBER 2013** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 70 marks**

Answer All questions

I. Elaborate on: **(2 x 20 = 40)**

1. a) Write the Electrophilic addition reactions of alkenes.
   b) Write about basicity of amines.

2. a) Explain the mechanisms involved in Elimination reactions.
   b) (i) Aldol Condensation.
      (ii) Hoffmann rearrangement.

II. Write notes on: **(10 x 3 = 30)**

1. Aliphatic Nucleophilic substitution V.s. Aromatic nucleophilic substitution.
2. Fries rearrangement.
3. Write the preparation and medicinal uses of
   a) Vanillin.
   b) Salicylic acid.
4. Write any three methods of preparation of carboxylic acids.
5. a) Williamsons synthesis.
   b) Sandmeyer reaction.
6. 1, 4-addition and. 1,2-addition reactions of Dienes.
7. Markownikoff's rule.
8. Bayers strain theory.
9. SN_1 VS. SN_2.
10. Phase transfer catalysis.

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[LE 804] **APRIL 2014** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 70 marks**

Answer All questions

I. Elaborate on: **(2 x 20 = 40)**

1. What are Electrophilic addition reactions? Explain any two reactions in detail.
2. Explain the mechanism and reactions of the following:
   a) Claisen condensation.
   b) Knoevenagel reaction.
   c) Perkin condensation.
   d) Kolbe reaction.

II. Write notes on: **(10 x 3 = 30)**

1. Diel's alder reaction.
2. Discuss the mechanism and synthetic uses of Aldol condensation.
3. Give an account of acid and base on the basis of Lewis theory.
4. Give an example for free radical halogenation of alkenes with respect to carbon-carbon double bond acting as a substituent.
5. Write a note on activating and deactivating Ortho, Para and Meta directing groups.
6. Write any two methods of conversion of acid to esters.
7. Riemer –Tiemann's reaction.
8. Write any two methods to prepare alkyl halides.
9. Add a note on carbocations.
10. Write the preparation, test for purity, Assay and uses of Saccharin.

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[LF 804] **OCTOBER 2014** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

(2009-2010 Regulation)

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 70 marks**

Answer All questions

I. Elaborate on: **(4 x 10 = 40)**

1. Discuss the reaction, mechanism of Nucleophilic aromatic substitution.
2. Briefly discuss Stereochemistry of SN1 and SN2 reaction.
   How rearrangement take place in carbocation in Nuclophilic aliphatic substitution.
3. Mention the reaction of conversion of acid to:
   a) Amide.
   b) Acid chloride.
   c) Esters.
   d) Anhydride.
4. Explain the following reaction with mechanism:
   a) Diazotisation and coupling.
   b) Aldol condensation.

II. Write notes on: **(6 x 5 = 30)**

1. Explain the addition reaction of conjugated dienes.
2. Write the structure, preparation, Assay and chemical uses of Sodium lauryl sulphate.
3. Explain the Wittig reaction with mechanisms.
4. Additions of carbine.
5. Orbital picture of Allyl radical.
6. Explain the mechanism of E1 and E2 reaction.

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[LG 804] **APRIL 2015** **Sub. Code: 3804**

DOCTOR OF PHARMACY (PHARM. D) DEGREE EXAMINATION

(2009-2010 Regulation)

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three Hours **Maximum: 70 marks**

Answer All questions

I. Elaborate on: **(4 x 10 = 40)**

1. Discuss the electrophilic substitution reaction in aromatic system.
   Explain Mechanism of their reaction.
2. Briefly discuss Markownikoff's rule and Peroxide effect with an example.
3. Discuss about Dehydro halogenation of alkyl halides.
   Explain about its Kinetic and mechanism of E1and E2 reactions.
4. Explain the following reaction with mechanism:
   a) Michael addition.
   b) Reimer tieman's reactions.

II. Write notes on: **(6 x 5 = 30)**

1. Write short notes on Baeyr's strain theory.
2. Mention the structure and name them according to IUPAC
   i) Formic acid.
   ii) Acetaldehyde.
   iii) Acetamide.
   iv) Neopentane.
3. Write the structure, preparation, Assay & chemical uses of Ethylene diamine dihyrate.
4. Explain stereochemistry of SN1 and SN2 reactions.
5. Explain the method of preparation of esters and anhydride.
6. Explain the Wittig reaction with mechanisms.

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[LH 804] **OCTOBER 2015** **Sub. Code: 3804**

PHARM. D DEGREE EXAMINATION

(2009-2010 Regulation)

FIRST YEAR

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code : 383804

Time: Three Hours **Maximum: 70 marks**

Answer ALL questions

I. Elaborate on : **(4 x 10 = 40)**

1. Write the electrophilic addition reactions of alkenes.
2. Explain the reactivity and orientation in Electrophilic aromatic substitution with activating and deactivating O, P, and M directing groups.
3. Give the mechanism involved in Aldol condensation and Hoffmann rearrangement.
4. Explain SN^1 reaction with reference to mechanism, kinetics and stereochemistry.

II. Write notes on : **(6 x 5 = 30)**

1. Protic and Aprotic solvents.
2. Phase transfer catalysis.
3. 1, 2 elimination reactions.
4. Allylic rearrangement.
5. Write the preparation and medicinal uses of
   (a) Sodium lauryl sulphate.
   (b) Methyl salicylate.
6. E2 vs. E1.

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[LI 804] APRIL 2016 **Sub. Code: 3804**

PHARM. D DEGREE EXAMINATION
(2009-2010 Regulation)
FIRST YEAR
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code : 383804

Time : Three hours **Maximum : 70 Marks**

I. Elaborate on : **(4 x 10 = 40)**

1. Explain theory of Resonance. Describe in detail Resonance hybrid, stability and orbital picture of Allyl Radical.

2. What are Alkanes? Explain the free radical substitution mechanism of chlorination of Methane in the presence UV light.

3. Discuss aromatic substitution reaction with Nucleophilies.

4. Explain the following reaction with mechanism:
   a) Cannizzaro reaction b) Williamson synthesis

II. Write notes on : **(6 x 5 = 30)**

1. Write a note on diazotisation and coupling reaction.
2. Write the structure, preparation and chemical uses of Mephensin.
3. Explain the mechanism and Stereochemistry of SN_2 reaction.
4. Explain the Kolbe reaction with mechanisms.
5. Define Isomerism with suitable examples.
6. Give the different methods for preparation of Alicylic compounds.

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[LJ 804] OCTOBER 2016 **Sub. Code: 3804**

PHARM. D DEGREE EXAMINATION
(2009-2010 Regulation)
FIRST YEAR
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code : 383804

Time : Three hours **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Discuss in detail about the mechanism and thermodynamics of free radical halogenations of methane.

2. Briefly explain the mechanism and kinetics involved in nucleophilic unimolecular and bimolecular reactions.

3. Explain Kolbe's reaction and Fries rearrangement.

4. Discuss the 1, 2 addition and 1, 4 addition reactions of conjugated dienes.

II. Write notes on: **(6 x 5 = 30)**

1. Write a brief note about the basicity of amines.
2. Briefly explain Bayer's strain theory.
3. Write a note on Resonance.
4. Write the test for purity, assay and medicinal uses of salicylic acid.
5. Explain Markownikoff rule with example.
6. Explain the acid base on the basis of Lowry-Bronsted concept.

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[LK 804] MAY 2017 **Sub. Code: 3804**

PHARM. D DEGREE EXAMINATION
(2009-2010 Regulation)
FIRST YEAR
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code : 383804

Time : Three hours **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. What do you understand the term aromatic electrophilic substitution reaction and its general mechanism. Discuss the aromatic electrophilic substitution reactions, sulphonation and friedel craft alkylation reaction.
2. What are Bayer's strain theory and its limitations? Discuss the relative stability of cyclohexane.
3. Discuss the reaction, mechanism and its synthetic application of
   a) Sandmayers reaction b) Reformatsky reaction
4. Discuss electrophilic and free radical reactions in alkenes.

II. Write notes on: **(6 x 5 = 30)**

1. Polarity of bond and molecules.
2. Stereoisomerism.
3. With example explain the mechanism of SN_2 reaction.
4. 1, 2 – addition *versus* 1, 4 – addition reaction in conjugated dienes.
5. Nucleophilic aromatic substitution reactions.
6. Discuss the preparation, assay and uses of Dimercaprol.

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[LL 804] OCTOBER 2017 **Sub. Code: 3804**

PHARM. D DEGREE EXAMINATION
(2009-2010 Regulation)
FIRST YEAR
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time : Three hours **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. What do you understand the term Aliphatic Nucleophilic substitution reactions? Explain the reaction, mechanism, kinetic, stereochemistry and factor influence SN_1 reactions.

2. Write in detail the mechanism of free radical halogenations of Methane. Discuss its thermodynamics.

3. Discuss the reaction, mechanism and its synthetic application of :
   a) Perkins condensation b) Cannizaro reaction.

4. Discuss the mechanism of the following:
   a) Nitration of Benzene b) Chlorination of Propene

II. Write notes on: **(6 x 5 = 30)**

1. Acid base theory.
2. Write a note on acidity of carboxylic acid.
3. Classification and stability of free radicals.
4. Conversion of carboxylic acid to acid chloride and amide.
5. Discuss the preparation, assay and uses of Vanillin.
6. Oxidation reactions.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LM 804] MAY 2018 **Sub. Code: 3804**

PHARM. D DEGREE EXAMINATION
(2009-2010 Regulation)
FIRST YEAR
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code : 383804

Time : Three hours **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Explain the mechanism of nucleophilic aromatic substitution reactions, orientation and reactivity of benzene.
2. Explain about the resonance stabilization of benzyl radical.
3. What are electrophilic addition reactions? Explain any two reactions in detail.
4. Explain the mechanisms of following name reactions:
   a) Perkin condensation b) Kolbe reaction.

II. Write notes on: **(6 x 5 = 30)**

1. Give an account of acid and base on the basis of Lewis theory.
2. Explain the addition reaction of conjugated dienes.
3. Discuss about allylic rearrangement with examples.
4. Write the preparation, test for purity, assay and medicinal use of mephensin.
5. What are cycloalkanes? Give an example. Discuss the preparation of cycloalkanes.
6. Illustrate a note on free radical chain reactions of alkane.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LN 804] AUGUST 2018 **Sub. Code: 3804**

PHARM. D DEGREE EXAMINATION
(2009-2010 Regulation)
FIRST YEAR
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code : 383804

Time : Three hours **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Define elimination reaction. Explain about its Kinetic, mechanism and isotopic effect of E1and E2 reactions.

2. Write a note on Markownikoff's rule and Peroxide effect.

3. Explain the following reactions:
   i) Aldol condensation. ii) Michael addition.

4. Explain Bayer's Strain Theory and discuss its limitations.

II. Write notes on: **(6 x 5 = 30)**

1. Write a note on activating and deactivating O, P, and M directing groups.
2. Explain Cannizaro reaction.
3. Add a note on Structural Isomerism.
4. Add a note on Free Radical substitution reaction of alkanes.
5. Preparation, test for purity, assay and uses of Vanillin.
6. What is dipole moment? Explain with suitable example.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LN 804] OCTOBER 2018 **Sub. Code: 3804**

PHARM. D DEGREE EXAMINATION
(2009-2010 Regulation)
FIRST YEAR
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code : 383804

Time : Three hours **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Explain the mechanisms of following name reactions:
   a) Cannizaro and Crossed Cannizaro reaction.
   b) Kolb's reaction.
2. Write the Mechanism, reactivity, orientation of aromatic electrophilic substitution reaction with suitable examples.
3. Explain Free Radical halogenations of alkanes with its mechanism.
4. Discuss the reaction, mechanism of Nucleophilic aromatic substitution.

II. Write notes on: **(6 x 5 = 30)**

1. Explain the Aldol Condensation.
2. Explain polar and non polar solvents.
3. Preparation, tests for purity, assay and uses of methyl salicylate.
4. Explain Bayer's Strain Theory.
5. Give the preparations of Ethers by Williamson's synthesis.
6. Add a note on Geometrical Isomerism.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LO 804] MAY 2019 **Sub. Code: 3804**

PHARM. D DEGREE EXAMINATION
(2009-2010 Regulation)
FIRST YEAR
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code : 383804

Time : Three hours **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Explain the Aliphatic nucleophilic substitution with mechanisms and kinetics involved in the reactions.
2. Explain the mechanisms of following name reactions:
   a) Benzoin condensation. b) Wittig reaction.
3. Explain the activating and deactivating O, P, and M directing groups in the aromatic compounds.
4. Give an account of acid and base on the basis of Lewis theory and Lowry-Bronsted concept.

II. Write notes on: **(6 x 5 = 30)**

1. Preparation, tests for purity, assay and uses of aspirin.
2. Explain the reaction mechanisms of Sandmeyer's reduction with suitable examples.
3. Explain fries rearrangement and Hofmann rearrangement.
4. Add a note on Isomerism.
5. What are cycloalkanes? Give example. How the cycloalkanes are prepared?
6. Polarity of bond and Aprotic solvents.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LP 804] OCTOBER 2019 **Sub. Code: 3804**

PHARM. D DEGREE EXAMINATION
(2009-2010 Regulation)
FIRST YEAR
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code : 383804

Time : Three hours **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Define nucleophiles. Explain briefly on the mechanism and kinetics of SN1 and SN2 reactions.
2. Enumerate the mechanism, reactivity and stability of free radical chain reactions of alkanes.
3. Define electrophile. Explain briefly about friedel craft alkylation and friedel craft acylation reaction with mechanism.
4. Compare and describe briefly on free radical substitution with free radical addition in carbon carbon double bonded systems.

II. Write notes on: **(6 x 5 = 30)**

1. Write a note on bimolecular displacement mechanisms.
2. Write a note on dienes and its types.
3. Brief out on Lewis Theory.
4. Write a note on the chemical properties of cyclo alkanes.
5. Briefly write a note on Markownikoff rule.
6. Add a note on the mechanisms of Knoevenagel reaction.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[PHARMD 0321] **MARCH 2021** **Sub. Code: 3804**

(OCTOBER 2020 EXAM SESSION)

PHARM. 'D' DEGREE EXAMINATION

FIRST YEAR (2009-2010 Regulation)

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code : 383804

Time : Three hours **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Explain the mechanism and reaction involved in
   a) Sandmeyer's reaction.
   b) Hofmann rearrangement.
2. Explain the mechanism, kinetics and orientation of E1 and E2 reactions.
3. Describe briefly about Baeyer strain theory by depicting the orbital picture of angle strain of various cyclo alkanes.
4. Enumerate the mechanism involved the peroxide initiated addition of hydrogen bromide to alkenes.

II. Write notes on: **(6 x 5 = 30)**

1. Define oxidation. Write a note on the types of oxidizing agents with examples.
2. Add a note on the acidity of Phenols.
3. Write the preparation, tests for purity, assay and uses of Mephenesin.
4. Enumerate briefly on the conversion of carboxylic acid into its various derivatives.
5. Write a note on activating and deactivating ortho, para and meta directing groups.
6. Write a note on Walden inversion.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[PHARMD 0122] **JANUARY 2022** **Sub. Code: 3804**

(OCTOBER 2021 EXAM SESSION)

PHARM. 'D' DEGREE EXAMINATION

FIRST YEAR (2009-2010 Regulation)

PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code : 383804

Time : Three hours **Answer ALL Questions** **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Discuss on the mechanism, kinetics and stereo chemistry of Aliphatic nucleophilic substitution with suitable examples.
2. Elaborate on the free radical halogenations reaction in alkenes. Compare free radical substitution with free radical addition.
3. Specify on the mechanism and ionization of carboxylic acids.
   Add a note on the conversion of acid to amide and ester.
4. Explain the following reactions:
   a) Fries Rearrangement.
   b) Reimer - Tiemann reaction.

II. Write notes on: **(6 x 5 = 30)**

1. Briefly write on the polarity of molecules and bonds.
2. Explain how the nomenclature of the organic compound is expressed in case of aldehydes and dienes.
3. What are the various organic redox reactions? Give a note on any one reaction.
4. Give the preparation, assay and use of Lactic acid and Ethyl benzoate.
5. Jot down on the basicity of amines.
6. What is resonance and hyperconjugation? Add salient features on the resonance stabilization of allyl radicals.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[PHARMD 0522] MAY 2022 Sub. Code: 3804
(APRIL 2022 EXAM SESSION)

PHARM. 'D' DEGREE EXAMINATION
FIRST YEAR (2009-2010 Regulation)
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY
Q.P. Code : 383804

Time : Three hours Answer ALL Questions Maximum : 70 Marks

I. Elaborate on: (4 x 10 = 40)

1. Explain briefly various reactions and mechanisms involved in the dehydrohalogenation of alkyl halides.
2. Compare and comment on aliphatic nucleophilic substitution and aromatic nucleophillic substitution.
3. Describe briefly on free radical halogenations of alkenes.
4. Explain briefly on
   a) Basicity of amines.
   b) Diazotisation and coupling of amines.

II. Write notes on: (6 x 5 = 30)

1. Write the preparation, tests for purity, assay and uses of Dimercaprol.
2. Add a note on the mechanisms of aldol condensation & crossed aldol condensation.
3. Write briefly on 1, 2 versus 1,4 addition reactions.
4. Allylic rearrangement.
5. Define Isomerism. Write a note on structural isomerism.
6. Write a note on Clemmenson reduction.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[PHARMD 1122] NOVEMBER 2022 Sub. Code: 3804
(OCTOBER 2022 EXAM SESSION)

PHARM. 'D' DEGREE EXAMINATION
FIRST YEAR (2009-2010 Regulation)
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY
Q.P. Code : 383804

Time : Three hours Answer ALL Questions Maximum : 70 Marks

I. Elaborate on: (4 x 10 = 40)

1. Explain Baeyer's Strain Theory and discuss its limitations.
2. Discuss briefly on the acidity of carboxylic acid and enumerate the conversion of carboxylic acid to acid chlorides, esters, amides and anhydrides
3. State Markownikoff rule and explain with mechanism about the addition of hydrogen halides to carbon-carbon double bonded systems.
4. Explain with mechanism about the dehydration of alcohol and factors leading to the ease of dehydration.

II. Write notes on: (6 x 5 = 30)

1. Briefly write on the Polarity of molecules.
2. Give an account on the preparation, test for purity, assay and medicinal uses of Chlorbutol and Urea.
3. Brief out on Reformatsky reaction with mechanism.
4. Write a note on cycloaddition reactions.
5. Give an account on the isotope effect in elimination reactions.
6. State the theory of resonance and sketch out the orbital picture of allyl radical.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[PHARMD 0423] APRIL 2023 Sub. Code: 3804

PHARM. 'D' DEGREE EXAMINATION
FIRST YEAR (2009-2010 Regulation)
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time : Three hours **Answer ALL Questions** **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Explain the mechanism of nucleophic aromatic substitution reactions, orientation and reactivity of benzene.
2. Explain about the electrophilic aromatic substitution reaction with emphasis to mechanism on halogenation and sulphonation.
3. Give an account of acid and base on the basis of Lewis theory and Lowry Bronsted theory.
4. Write a note on:
   i) Williamson Synthesis
   ii) Michael addiction.

II. Write notes on: **(6 x 5 = 30)**

1. Write a note on the acidity of phenols.
2. Brief out on Perkin condensation with mechanism.
3. Give an account on the phase transfer catalysis.
4. Write a note on per oxide effect.
5. Explain the Sandmeyer's reaction with suitable examples.
6. Give an account on the preparation, test for purity, assay and medicinal uses of mephenesin and salicylic acid.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[PHARMD 1023] **OCTOBER 2023** **Sub. Code: 3804**

PHARM. 'D' DEGREE EXAMINATION
FIRST YEAR (2009-2010 Regulation)
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time : Three hours **Answer ALL Questions** **Maximum : 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Elaborate on the bimolecular displacement reaction with suitable examples.

2. Summarize on any two condensation reactions used as synthetic tools.

3. Distinguish on the mechanism, kinetics and stereo chemistry of SN1 & SN2 reactions with suitable examples.

4. Explain the activating, deactivating O, P and M directing groups in the aromatic compounds.

II. Write notes on: **(6 x 5 = 30)**

1. Brief out on the ionic and non ionic solutes.
2. Explain how the nomenclature of the organic compound is expressed in case of amides and cycloalkanes.
3. Give a note on the preparation, assay and uses of ethylene diamine and methyl salicylate.
4. Give the following general reactions: Michael addition and Wittig reaction.
5. Discuss on the acidity of Phehols.
6. Discuss in brief on 1, 4 – addition reactions of conjugated dienes.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[PHARMD 0424] **APRIL 2024** **Sub. Code: 3804**

PHARM. 'D' DEGREE EXAMINATION
FIRST YEAR (2009-2010 Regulation)
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three hours **Answer ALL Questions** **Maximum: 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Distinguish Markownikoff's rule and peroxide effect with suitable example.
2. Summarize on Nucleophilic addition reactions and distinguish alkyl nucleophilic substitution with acyl nucleophilic substitution.
3. Give emphasis on various physical properties of organic molecules.
4. Explain the following reactions:
   i) Kolbe reaction.
   ii) Sandmeyer's reaction.

II. Write notes on: **(6 x 5 = 30)**

1. What is vinyl cation and report on SN2 nucleophilic substitution in vinylic substrate?
2. Explain how the nomenclature of the organic compound is expressed in case of alkenes and esters.
3. Report on halohydrin formation along with equation.
4. Give the preparation, assay and use of Paraldehyde and Tartaric acid.
5. Describe dehydration of alcohols.
6. Write on the stabilization of benzyl radical with diagrammatic representation.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[PHARMD 1024] **OCTOBER 2024** **Sub. Code: 3804**

PHARM. 'D' DEGREE EXAMINATION
FIRST YEAR (2009-2010 Regulation)
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three hours **Answer ALL Questions** **Maximum: 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Discuss in details about the mechanism and thermodynamics of free radical halogenations of methane.

2. Specify on the various acid base theories. Write a note on Perkin condensation.

3. What do you mean by electron deficient nitrogen and explain the mechanism of Hoffman Rearrangement.

4. Summarize on the effect of various substituents on acidity and the mechanism of ionization of acids.

II. Write notes on: **(6 x 5 = 30)**

1. Distinguish between E1 & E2 reactions.
2. Explain how the nomenclature of the organic compound is expressed in case of alkenes and esters?
3. Report on allyl radical as resonance hybrid and how are they stabilized?
4. Give the preparation, assay and use of Vanillin and Glyceryl tri nitrate.
5. Brief out on cannizaro and crossed cannizaro reactions.
6. Point out the observations on Bayer's strain theory.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[PHARMD 0425] APRIL 2025 Sub. Code: 3804

PHARM. 'D' DEGREE EXAMINATION
FIRST YEAR (2009-2010 Regulation)
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three hours **Answer ALL Questions** **Maximum: 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Explain the theory of Resonance. Describe in detail about resonance hybrid, stability and orbital picture of Allyl radical.
2. Explain in briefly about
   a) Basicity of Amines b) Acidity of phenol
3. Compare and describe briefly on free radical substitution with free radical addition in Carbon Carbon double boned system.
4. Discuss the reaction and Mechanism involved in the followings:
   a) Cannizzaro reaction
   b) Reformatsky reaction

II. Write notes on: **(6 x 5 = 30)**

1. Mention the structure and name them according to IUPAC.
   a) Neopentane b) Ethyl acetate c) Acetaldehyde d) Formic acid
2. Discuss the stereochemistry of SN^1 and SN^2 reaction.
3. Write a note on activating and deactivating ortho, para and meta directing groups.
4. Discuss the Diel's alder rection with mechanism.
5. Write any three methods of preparations of Carboxylic acids.
6. Write the Preparation, test for purity, assay and uses of Methyl salicylate.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[PHARMD 1025] **OCTOBER 2025** **Sub. Code: 3804**

PHARM. 'D' DEGREE EXAMINATION
FIRST YEAR (2009-2010 Regulation)
PAPER IV – PHARMACEUTICAL ORGANIC CHEMISTRY

Q.P. Code: 383804

Time: Three hours **Answer ALL Questions** **Maximum: 70 Marks**

I. Elaborate on: **(4 x 10 = 40)**

1. Define electrophiles and explain in detail about the mechanism, rearrangement, orientation and reactivity of Electrophilic addition reaction.
2. Summarize the mechanisms of Aldol condensation and Reformatsky reaction.
3. Discuss the mechanism, relative reactivity and stability of Free radical chain reactions of Alkanes.
4. State on the effect and types of substituent groups. Explain the mechanisms of i) Nitration and ii) Friedal-crafts alkylation of Electrophilic aromatic substitution.

II. Write notes on: **(6 x 5 = 30)**

1. Describe the stability, orbital picture and resonance stabilization of Benzyl radical.
2. Illustrate the preparation, assay and medicinal uses of i) Dimethyl Phthalate and ii) Sodium Lauryl Sulphate.
3. Define and discuss the stability of conjugated dienes. Add a note on Allylic rearrangement.
4. Explain the mechanism of E2 elimination. Distinguish between SN_1 and SN_2 reaction.
5. Give an account on i) Hyper-conjugation and ii) Intermolecular Forces.
6. Recall the concept of Basicity of amines. Write the mechanism of Diazotization reaction.

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