

## FACULTY OF PHARMACY

M. Pharmacy (Pharmaceutical Chemistry) II-Semester (PCI) (Main) Examination,  
August 2019

Subject: Advanced Organic Chemistry – II

Time: 3 Hours

Max. Marks: 75

**Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) Explain the principle involved in the continuous flow reactors. Discuss their industrial Applications.  
(b) Write a note on solvents used in microwave assisted synthesis. (8+7)
- 2 (a) Discuss the sequential strategies for solution phase peptide synthesis.  
(b) Write a note on side reactions in peptide synthesis. (8+7)
- 3 (a) What are pericyclic reactions? Discuss any two types of pericyclic reactions with mechanism.  
(b) Discuss the basic principles of photo chemical reactions. (10+5)
- 4 (a) What is heterogeneous catalysis ? Write the advantages and disadvantages  
(b) Discuss in detail about the homogenous catalysis used in drug synthesis with example. (8+7)
- 5 (a) Write a note on chiral auxiliaries and catalytic asymmetric synthesis. (9+6)  
(b) What are racemates? Explain resolution of racemates and its applications.
- 6 Write a short note on : (3+6+6)  
(a) Specific rotation  
(b) Protecting agents in peptide synthesis  
(c) Ultra sound assisted synthesis
- 7 (a) Discuss about protection, solid supports, linkers activation procedures in solid phase peptide synthesis.  
(b) HF cleavage protocols. (10+5)
- 8 Write a short note on:  
(a) Applications of Microwave technology in organic reactions.  
(b) Phase transfer catalysis (8+7)

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**FACULTY OF PHARMACY****M. Pharmacy (Pharmaceutical Chemistry) II-Semester (PCI) (Main) Examination,  
August 2019****Subject: Advanced Spectral Analysis****Time: 3 Hours****Max. Marks: 75****Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) Discuss Woodward Fieser rule with examples ? Discuss the calculation of  $\lambda_{max}$  for cyclic dienes and unsaturated carbonyl compounds with examples. (8+7)  
(b) Discuss how IR spectra is useful in structural elucidation of organic compounds with any four structures .
- 2 Write a detailed account on : (8+7)  
(a) 1-D NMR  
(b) INADEQUATE
- 3 (a) Discuss Mc Lafferty rearrangement and Ring rule.  
(b) Give the mass fragmentation rule for amine, carbonyl compounds and halides. (7+8)
- 4 Explain the Principle, instrumentation and applications of following (8+7)  
(a) HPTLC (b) GC-MS
- 5 Give the instrumentation and applications of following : (8+7)  
(a) DTA (b) DSC
- 6 Write a short note on : (8+7)  
(a) HPTLC  
(b) Super critical fluid chromatography
- 7 Explain the Principle and applications of following : (8+7)  
(a) COSY (b) HECTOR
- 8 Write a short note on : (8+7)  
(a) ELISA  
(b) Bio assay of digitalis

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**FACULTY OF PHARMACY****M. Pharmacy (Pharm. Chemistry) II-Semester (PCI) (Main) Examination,  
August 2019****Subject: Pharmaceutical Process Chemistry****Time: 3 Hours****Max. Marks: 75****Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) Explain in detail validation of Large scale process. (7)  
(b) Write a note on case studies of APIS in scale up process. (8)
- 2 (a) Write a note on factors affecting crystallization. (6)  
(b) Write a note on types of types of extraction. (9)
- 3 (a) Write the kinetics, mechanism and types of halogenations reactions. (8)  
(b) Explain types of oxidation reactions and nonmetallic oxidizing agents. (7)
- 4 (a) Explain the production of Vitamins. (8)  
(b) Discuss the case study on Industrial reduction process. (7)
- 5 (a) Write a detailed note on ISO-14001. (8)  
(b) Discuss about effluents and management system in industries. (7)
- 6 (a) Explain about aerobic and anaerobic fermentation with examples. (6)  
(b) Write the mechanism of aromatic nitration and process equipment for technical nitration. (9)
- 7 (a) Write a note on characteristics of expedients routes, cost effective routes, reagent selection for scale up. (9)  
(b) Explain hydrogen transfer reactions in reduction. (6)
- 8 (a) Write the importance of OHSAS. (8)  
(b) Write a detailed note on Azeotropic distillation. (7)

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**FACULTY OF PHARMACY****M. Pharmacy (Pharmaceutical Chemistry) II-Semester (PCI) (Main) Examination,  
August 2019****Subject: Computer Aided Drug Design****Time: 3 Hours****Max. Marks: 75****Note: Answer any five questions. All questions carry equal marks.**

- 1 (a) Discuss in detail about various parameters used in QSAR.  
(b) How substituent hydrophobicity constant is used in the QSAR? Discuss with an example equation. (10+5)
- 2 (a) What is Hansch analysis and Discuss how it is used in predicting the biological activity?  
(b) Give the advantages and disadvantages of Hansch analysis. (9+6)
- 3 (a) What is quantum mechanics? Describe the use of quantum mechanics in drug design.  
(b) What is molecular docking? Discuss the steps involved in molecular docking? (8+7)
- 4 (a) What is Homology modeling? Discuss its importance in drug design. (8+7)  
(b) Write a note on fragment based drug design.
- 5 (a) What is known as pharmacophore? Discuss the concept of Pharmacophore based virtual screening.  
(b) Write a note on pharmacophore modeling. (8+7)
- 6 (a) Write a note on Scoring techniques in Molecular docking.  
(b) Discuss various models for predicting ADMET properties. (7+8)
- 7 (a) What is virtual screening ? Discuss about druglikeness screening.  
(b) Write a note on Privileged structures. (8+7)
- 8 (a) What is bioactive conformation ? Discuss various energy minimization techniques. (8+7)  
(b) Write a note on application of Free Wilson analysis in drug design.

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## FACULTY OF PHARMACY

M. Pharmacy (Pharm. Chemistry) II-Semester (PCI) (Suppl.) Examination,  
February 2019

Subject : Advanced Organic Chemistry-II

Time: 3 Hours

Max. Marks: 75

**Note: Answer any five questions. All questions carry equal marks.**

- 1 a) Discuss the Principle and applications of microwave irradiation reactions  
b) Explain the basic principles of green chemistry in organic synthesis. (7+8)
- 2 Discuss asymmetric synthesis using chiral pool, chiral auxiliaries, chiral catalysts and chiral solvents with suitable examples
- 3 a) Write a note on transition – metal catalysed reactions in organic synthesis  
b) What is biocatalysis? Describe the organic synthesis by using enzymes.  
c) Discuss hydrogenation reactions using homogenous catalysts.
4. Discuss electro cyclic and sigma tropic reactions in presence of heat and light with suitable examples
5. a) Write a note on solid phase combinatorial synthesis.  
b) Discuss Various solid supports, linkers, protecting and deprotecting groups used in solid-phase peptide synthesis
6. a) Discuss any two methods of resolution of racemic mixtures. 9  
b) Discuss sequence rules of R & S configuration with suitable examples. Explain how it is different from Fisher's D & L notations? 6
7. Write a note on  
a) Photo – addition reactions  
b) Phase – transfer catalysis  
c) Ultra sound assisted reactions (5+5+5)
8. a) Discuss cycloaddition reactions with mechanism and stereochemistry in presence of heat and light.  
b) Discuss coupling reactions in peptide synthesis (8+7)

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**FACULTY OF PHARMACY**  
**M. Pharmacy (Pharmaceutical Chemistry) II-Semester (PCI) (Suppl.)**  
**Examination, February 2019**

**Subject: Pharmaceutical Process Chemistry**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer any five questions. All questions carry equal marks.**

1. a) Explain in detail validation of Large scale Process.  
b) Write the Case studies of some Scale up Process of APIs. (7+8)
2. a) Write a note on types of filtration.  
b) Discuss the principle and general methods of preparation of polymorphs, hydrates, solvates and amorphous APIs. (7+8)
3. a) Write a note on nitrating agents, equipment for technical nitration.  
b) Write a note on types of halogenations, Catalytic halogenations. (8+7)
4. a) Explain about aerobic and anaerobic fermentation with examples.  
b) Write a note on cost effective routes, families of reagents useful for scale up (6+9)
5. a) Write a detail note on MSDS.  
b) Discuss about effluents and management system in industries. (6+9)
6. a) Give a note on fire hazards and types of fire extinguishers.  
b) Write about personal protection equipment. (8+7)
7. a) Discuss the types of extraction.  
b) Explain hydrogen transfer reactions in reduction. (8+7)
8. a) Write the Importance of OHSAS.  
b) Explain about steam distillation. (8+7)

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**FACULTY OF PHARMACY**  
**M. Pharmacy (Pharmaceutical Chemistry) II-Semester (PCI) (Suppl.)**  
**Examination, February 2019**

**Subject: Computer Aided Drug Design**

**Time : 3 Hours**

**Max. Marks: 75**

**Note: Answer any Five questions. All questions carry equal marks**

1. a) What is QSAR? Describe the physicochemical parameters used in QSAR.  
b) Explain how hydrophobicity constant and Hammett constants of a substituent are measured experimentally? (10+5)
2. a) Discuss in detail about Hansch analysis and its applications.  
b) Write a note on 3D QSAR studies. (9+6)
3. a) What is quantum mechanics? Describe the use of quantum mechanics in drug design.  
b) What is molecular docking? Discuss the general method of molecular docking. (8+7)
4. a) Describe the steps involved in Homology modeling of a protein. (8+7)  
b) Discuss the concept of predicting ADMET properties and its importance in drug design.
5. a) What is known as pharmacophore? Discuss the concept of Pharmacophore based virtual screening.  
b) Write a note on Similarity based Virtual screening (8+7)
6. a) Write a note on Scoring techniques in Molecular docking.  
b) Write a note on Fragment based drug design. (7+8)
7. a) What is virtual screening? Enumerate various virtual screening techniques.  
b) Write a note on Privileged structures. (8+7)
8. a) Discuss the importance of molecular Mechanics in drug design.  
b) What is Free Wilson analysis? What are the advantages and disadvantages over Hansch analysis?

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## FACULTY OF PHARMACY

M. Pharmacy (Pharmaceutical Chemistry) II-Semester (PCI) (Suppl.) Examination,  
February 2019

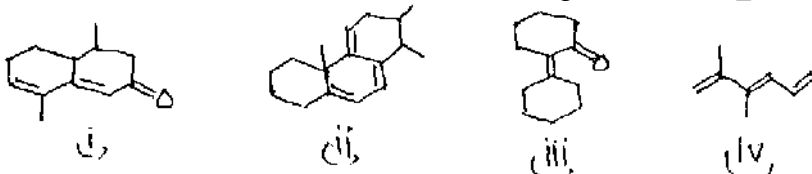
Subject : Advanced Spectral Analysis

Time: 3 Hours

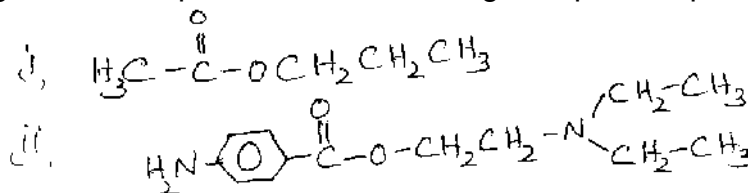
Max. Marks: 75

**Note: Answer any five questions. All questions carry equal marks.**

- 1 a) Write down the Woodward – Fieser rules for 1,3-butadienes and  $\alpha, \beta$ -Carbonyl Compounds. Calculate the  $\lambda_{max}$  for the following.



- b) How do you know the presence of  $C \equiv N$ ,  $NH_2$ ,  $OH$ ,  $SO_2$  and  $NO_2$  groups in IR? (Indicate the wave number ranges). (10+5)
- 2 Discuss about any two 2-D NMR techniques in interpretation of structure of organic compounds.
3. a) Discuss the fragmentation patterns of following functional groups in mass Spectrometry  
 a) Alkanes    b) Carbonyl compounds    c) Amines    d) Alcohols.  
 b) Explain Mc Lafferty rearrangement.  
 c) How do you detect the isotopic peaks in mass spectrometry? (8+4+3)
4. Discuss the principle, instrumentation and applications of any two of the following:  
 a) GC-MS    b) HPTLC    c) Flash chromatography
5. Discuss the principle, instrumentation and applications of  
 a) DSC    b) Raman Spectroscopy
6. a) Explain the principle and applications of ELISA  
 b) Discuss radio immune assay of insulin (8+7)
7. Write a note on the following (any two)  
 a) Super Critical fluid chromatography  
 b) LC-MS  
 c) Ion-exclusion chromatography
8. a) Draw a rough  $^1H$ NMR Spectra for the following with proton splitting pattern



- b) Where shall we expect the  $C=O$  stretchings for the following aromatic compounds?  
 a) Aldehydes    b) Ketones    c) Carboxylic acids    d) esters  
 e)  $\beta$ -lactams    f) amides    g) anhydrides  
 h)  $\alpha, \beta$ -Unsaturated carbonyl compounds (8)



