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MANIPAL UNIVERSITY

FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2016

SUBJECT: MEDICINAL CHEMISTRY – I (PCH 601T)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

(2014 REGULATION)

Wednesday, May 18, 2016

Time: 10:00 – 13:00 Hrs. Max. Marks: 100

✍ **Answer ALL questions.**

1. Explain the generation of FBDD libraries. Write the advantages of FBDD over HTS.

(10 marks)

2. Explain reductive and hydrolytic biotransformation.

(10 marks)

3. Giving suitable example, explain the binding role of carboxylic group and carbon skeleton.

(10 marks)

4. Explain simplification of structure and ring fusion as drug optimizing strategies.

(10 marks)

5. Give an account of different types of drug targets.

(10 marks)

6. Explain the role of solubility in drug design and give BCS classification of drugs.

(10 marks)

7. Discuss the mechanisms of drug interaction.

(10 marks)

8. Discuss the importance of optical isomerism in drug discovery.

(10 marks)

9. **Write short notes:**

9A. Contribution of natural products for drug discovery
9B. Lead discovery strategies

(5 marks × 2 = 10 marks)

10. **Write briefly on the following:**

10A. Utility of prodrugs for drug targeting
10B. Types of HTS assay

(5 marks × 2 = 10 marks)

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FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2016

SUBJECT: MEDICINAL CHEMISTRY – II (PCH 602T)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

(2014 REGULATION)

Friday, May 20, 2016

Time: 10:00 – 13:00 Hrs. Max. Marks: 100

✍ **Answer ALL questions.**

1. Discuss the principle and applications of Site Directed Mutagenesis and Epitope Mapping.

(10 marks)

2. Explain split and Mix method, Tea Bag method and Multipin method in solid phase chemistry. Highlight their advantages and disadvantages.

(10 marks)

3. Discuss the role of biomarkers in drug discovery, drug safety studies and health care.

(10 marks)

4. Explain the safety and efficacy determination for a new chemical entity.

(10 marks)

5A. How will you measure the hydrophobic characteristics of a new drug? Explain.

5B. Explain the Hammett substituent constant (σ) and give its applications.

(5+5 = 10 marks)

6. Explain the steps involved in the solid phase peptide synthesis and mention its advantages over solution phase synthesis.

(10 marks)

7. How is the new chemical entity evaluated for CYP inhibition? Mention the importance of this study.

(10 marks)

8. What is molecular docking? Explain the various docking procedures.

(10 marks)

9. **Write short notes:**

9A. Protein crystallography

9B. Different types of patents and their applications

(5 marks × 2 = 10 marks)

10. **Write briefly on the following:**

10A. Determine if there is any significant difference in the distribution of patients between socioeconomic classes of population from which samples A & B were observed.

Socio-economic class[SEC]	Sample A	Sample B
I	18	6
II	26	22
III	40	35

10B. Write a note on integrity and purity of a new chemical entity.

(5 marks × 2 = 10 marks)

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FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2016

SUBJECT: PHARMACEUTICAL PROCESS CHEMISTRY (PCH 603T)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

(2014 REGULATION)

Monday, May 23, 2016

Time: 10:00 – 13:00 Hrs. Max. Marks: 100

✍ **Answer ALL questions.**

1. Giving examples, discuss the effect of aging, rate and order addition of reagents on reagent reactivity.

(10 marks)

2. Discuss the applications of phase transfer catalysis with suitable examples. What are the advantages and disadvantages of using supported reagents?

(10 marks)

3. What is protection and deprotection in organic chemistry? Explain any four methods used for protection and cleavage of hydroxyl groups.

(10 marks)

4. **Discuss on the following:**

4A. Aqueous and non-aqueous work-up procedures

4B. Objectives of salt selection

(10 marks)

5. Give an account on ICH guidelines on residual solvents and add a note on effect of solvation on reactivity.

(10 marks)

6. Mention the factors affecting the polymorphism. How polymorphism can be evaluated?

(10 marks)

7. Discuss about the basic concepts in salts formation and explain the techniques available for the characterization of salts.

(10 marks)

8. Give a detailed account of enzymes used for oxidative and hydrolytic chemical transformations.

(10 marks)

9. **Write short notes on:**

9A. Reactive crystallization technique

9B. Mechanism of nucleation

(5 marks × 2 = 10 marks)

10. **Write briefly on the following:**

10A. Reaction runaway scenarios encountered in industries.

10B. Applications of ionic liquids including their advantages.

(5 marks × 2 = 10 marks)

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FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2016

SUBJECT: ADVANCED ORGANIC CHEMISTRY (PCH 604T)
(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)
(2014 REGULATION)

Wednesday, May 25, 2016

Time: 10:00 – 13:00 Hrs. Max. Marks: 100

✍ **Answer ALL questions.**

1. Describe the methods of synthesis and chemical reactions of Pyrilium ions. Write the names and structures of benzo[b] fused five membered heterocyclics.

(10 marks)

2. Write the tautomeric structures of purines mentioning their stabilities. Give one method each for the preparation of pyrones.

(10 marks)

3. Give the structures and important uses of the following reagents in organic synthesis:

3A. DBU

3B. DIPEA

3C. N- butyl lithium

(10 marks)

4. Explain the retro synthetic analysis and forward synthesis of Ethambutol.

(10 marks)

5. Write the mechanisms involved in Dess-Martin oxidation and Heck reaction.

(10 marks)

6. Explain sharpless epoxidation reaction with an example.

(10 marks)

7. Discuss in detail **Mukaiyama** asymmetric aldol reactions.

(10 marks)

8. What are the advantages and disadvantages of extra annular and intra annular chirality transfer?

(10 marks)

9. **Write short note on:**

9A. Clemmensen reduction.

9B. Dakin reaction.

(5 marks × 2 = 10 marks)

10. **Write briefly on the following:**

10A. Aza-indolizines.

10B. Enzyme catalyzed dynamic kinetic resolution.

(5 marks × 2 = 10 marks)

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FIRST YEAR M. PHARM. DEGREE EXAMINATION – MAY 2016

SUBJECT: SPECTRAL AND CHROMATOGRAPHIC TECHNIQUES (PCH 605T)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY & PHARMACOGNOSY)

(2014 REGULATION)

Friday, May 27, 2016

Time: 10:00 – 13:00 Hrs. Max. Marks: 100

1A. Write briefly the principle of ^{13}C NMR spectroscopy and highlight the features of ^{13}C NMR which distinguish it from PMR.

1B. Assign the given chemical shift values to the appropriate carbons in the following:

i) δ : 7.9, 211, 35.4 and 30.6 in ethyl methyl ketone.

ii) δ : 10.2, 22.9 32.3 and 69 in 2-butanol.

iii) δ : 123.9, 135.9 and 150.2 in pyridine.

(4+6 = 10 marks)

2. What is electrophoresis? Classify the different methods of electrophoresis and explain the principle of capillary electrophoresis. Discuss the applications of capillary electrophoresis.

(10 marks)

3A. Enumerate the differences between APT and DEPT with example and spectral representation.

3B. Discuss in detail about Electrospray ionization.

(5+5 = 10 marks)

4. What is the principle, methodology and types involved in 2D NMR spectroscopy? Explain with the help of an example, a ^{1}H-^{1}H COSY spectrum.

(10 marks)

5. Discuss in detail about factors affecting ion abundance and alpha cleavage (radical site initiation)

(10 marks)

6A. With a neat diagram, explain the principle and working of Thermal conductivity detector.

6B. Discuss the advantages and disadvantages of Gas-liquid chromatography.

(5+5 = 10 marks)

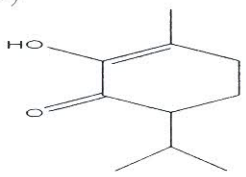
7A. Explain the following:

i) Bathochromic effect ii) Hypsochromic effect

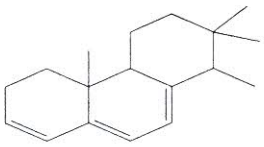
iii) Hypochromic effect iv) Hyperchromic effect

7B. Calculate λ_{max} for the following:

i)



ii)



(4+6 = 10 marks)

8. What are the different types of stationary phases used in HPLC? Discuss with examples how to select a particular column.

(10 marks)

9. **Write short notes on:**

9A. The expected IR peaks for salicylic acid and paracetamol

9B. Electronic effects and hydrogen bonding in IR spectroscopy

(5 marks × 2 = 10 marks)

10. **Write short notes on:**

10A. Different supercritical fluids used in supercritical chromatography along with the advantages and disadvantages of these solvents

10B. Longitudinal diffusion

(5 marks × 2 = 10 marks)