Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2014

SUBJECT: MEDICINAL CHEMISTRY – I (PCH 601)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Saturday, May 24, 2014

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

1A. Explain fragment based drug discovery with a case study. What is the importance of optical isomerism in drug discovery?

1B. What is cell based assay in HTS? Explain the technologies used.

(10+10 = 20 marks)

2A. What are prodrugs? Classify with suitable examples. Write a note on mutual prodrugs and double prodrugs.

2B. In detail explain conjugation reactions.

2C. Explain lead identification and lead modification.

(7+8+5 = 20 marks)

3A. **Write short notes on:**

i) Role of stereochemistry in drug design

ii) Optimisation of hydrophilic properties

3B. Explain homologation technique and its importance in drug design .

(10+10 = 20 marks)

4A. Discuss about various drug targets and their identification.

4B. Write note on hERG binding studies and its importance in drug discovery.

4C. Discuss the catalytic role of enzymes.

(10+5+5 = 20 marks)

5A. Explain the importance of studying drug-drug interaction in drug discovery.

5B. Explain the significance of membrane permeability of a drug .With an examples, explain how membrane permeability of a drug can be improved.

(10+10 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2014

SUBJECT: MEDICINAL CHEMISTRY – II (PCH 602)
(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Monday, May 26, 2014

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

✍ **Answer ALL questions.**

1A. Discuss how peptides libraries are built up using combinatorial chemistry approach.

1B. Explain the role of PCR and Gel electrophoresis in new drug discovery.

(10+10 = 20 marks)

2A. What are biomarkers? Add a note on ideal biomarker.

2B. What is intellectual property? Explain the different classes of IPR.

2C. A drug 'A' was tested for its anti-pyretic activity by the Brewer's yeast- induced pyrexia method in a group of albino rats of Wistar strain. The table below shows the rectal temperatures of the three groups of animals. All the treatments were administered 1 hour before induction of pyrexia. Apply an appropriate statistical procedure, and find out whether drug 'A' shows any antipyretic action. If yes, is it better than the control or the standard?

Control (0.9% saline)	37.2	39.4	38.4	37.6	37.6	37.0	38.0	39.0
Test (Drug A)	37	37.1	37.3	37.2	36.9	37.1	37.8	37.5
Standard (paracetamol)	37.1	37.3	37.6	37.5	37.2	37.9	37.4	36.9

(5+5+10 = 20 marks)

3A. Write the role of biological and metabolic stability testing for a new chemical entity.

3B. Mention the importance of CYP inhibition studies and explain the methods to evaluate them.

(10+10 = 20 marks)

4A. Write short notes on the following:

i) Protection of α–amino group

ii) Role of deprotection in peptide synthesis

4B. Explain protein crystallography in detail

((5+5)+10 = 20 marks)

5A. Explain:

i) SOMFA ii) HASL iii) CoMMA

iv) MS-Whim v) HINT vi) Hammett substituent constant (σ)

5B. Explain in detail, hydrophobic parameter in QSAR.

(12+ 8 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2014

SUBJECT: PHARMACEUTICAL PROCESS CHEMISTRY (PCH 603)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Wednesday, May 28, 2014

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

✍ **Answer ALL questions.**

1A. Explain the use complex formation to modify reagent reactivity with suitable examples.

1B. Explain ICH guideline on residual solvents.

1C. Enlist the different sources of byproduct formation in chemical process.

(8+8+4 = 20 marks)

2A. Discuss any five methods used for the protection and deprotection of alcohols.

2B. Discuss the use of organic solvents on enzyme catalyzed reactions.

(10+10 = 20 marks)

3A. Write a note on the following:

i) Practical problems associated with the classical work-up operations.

ii) Simplification of reaction work-up procedures.

3B. Discuss about the influence of polymorphism on drug solubility, dissolution, bioavailability and bioequivalence.

(10+10 = 20 marks)

4A. Briefly explain about chemical reaction hazards.

4B. Explain the effect of salt forms on physico-chemical and biological properties.

4C. What are immobilized enzymes? Explain the different methods of immobilization.

(5+10+5 = 20 marks)

5A. How ionic liquids are purified? Explain.

5B. Write a note on mechanism of nucleation.

5C. Discuss about cooling crystallization technique and crystallization by the addition of antisolvent.

(5+5+10 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2014

SUBJECT: ADVANCED ORGANIC CHEMISTRY (PCH 604)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Friday, May 30, 2014

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

Answer ALL questions:

1A. Write two methods each for the preparation of coumarins and benzothiazoles.

1B. What are synthons? Classify them with examples giving their synthetic equivalents.

1C. Explain retrosynthesis and forward synthesis of ethambutol.

(7+6+7 = 20 marks)

2A. With example, explain the mechanism involved in Wittig Rearrangement reaction.

2B. Give the tautomeric forms of purines indicating their stability. Write the methods of synthesis of purines, quinoliines and pyrido – pyrimidines. Suggest a suitable method to prepare 4-nitro pyridine. Write the structures of thieno [2,3-b] furan and 1H- pyrazolo [4,3-d] oxazole.

(5+15 = 20 marks)

3A. Discuss the important uses of following three reagents used in organic synthesis:
i) NBS ii) Boron tribromide iii) Sodium hydride

3B. Explain the mechanism involved in Suzuki-Miyaura cross coupling reaction.

3C. Explain enzymatic catalytic kinetic resolution.

(10+5+5 = 20 marks)

4A. What are the different types of aldol reactions? Explain with examples.

4B. Discuss the sharpless epoxidation reactions in detail.

4C. Explain chelation enforced chirality transfer.

(7+8+5 = 20 marks)

5A. Explain the mechanism involved in Jones Oxidation reaction.

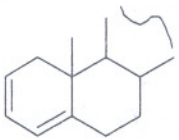
5B. What are hetero Diels-Alder reactions?

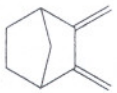
5C. Write the principle and methodology involved in affinity chromatography.

5D. With example, explain the mechanism involved in Heck reaction.

(5+5+5+5 = 20 marks)

5A. Calculate λ_{max} for the following:

i) 

ii) 

5B. Explain how shift reagents are used in the structural determination of flavonoids.

5C. Write the expected IR peaks for ethanol and salicylic acid.

5D. Enlist the applications of HPLC technique.

(5+5+5+5 = 20 marks)