Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: MEDICINAL CHEMISTRY – I (PCH 601)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Friday, May 24, 2013

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

1A. Explain the generation of FBDD libraries. Write any four advantages of FBDD over HTS. Give the usefulness of racemic mixture with suitable examples.

1B. Mention different types of functionalization reactions. Explain reductive and hydrolytic biotransformation.

(10+10 = 20 marks)

2A. How prodrugs are used for drug targeting? Explain with justification.

2B. Enlist the types of HTS assay and discuss any one of them.

2C. Giving suitable example, explain the binding role of carboxylic group and carbon skeleton .

(5+5+10 = 20 marks)

3A. Explain simplification of structure and ring fusion as drug optimizing strategies.

3B. Prove the structure of cardiac glycosides.

3C. Discuss lead discovery strategy in detail.

(10+5+5 = 20 marks)

4A. Mention desirable properties of radio ligands and give their limitations.

4B. Mention the application of fluorogenic substrate to configure peptidase screening.

4C. Explain the role of solubility in drug design and give BCS classification of drugs.

(5+5+10 = 20 marks)

5A. Discuss the mechanisms of drug interaction.

5B. How do you use microbes as source of drugs? Explain.

5C. Explain the strategies to make drugs less resistant to drug metabolism.

5D. Discuss about intrinsic ion channels as drug targets.

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

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: MEDICINAL CHEMISTRY – II (PCH 602)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Monday, May 27, 2013

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

✍ Answer ALL questions.

1A. Explain the usage of scavenger resin in combinatorial chemistry. Add a note on the solid supports used.

1B. Discuss the various steps used in recombinant DNA technology and enlist their applications.

(10+10 = 20 marks)

2A. Write notes on different classes of biomarkers and their applications.

2B. Explain the criteria for patentability in India .

2C. Mention the methods of peptide synthesis and explain Fmoc polyamide synthesis of a dipeptide.

(8+5+7 = 20 marks)

3A. Discuss the toxicity testing methods for a new chemical entitiy.

3B. Define integrity and purity. Mention their applications in the evaluation of a new chemical entity.

3C. The data for serum cholesterol levels (mg/dl) of three groups of rats is given below. Suggest an appropriate statistical test to find out if atorvastatin and NAT-1 have hypo-cholesterolemic actions. Justify your answer at an appropriate confidence interval estimate.

Control	220	245	230	310	240	255	235	215
Atorvastatin	215	240	225	295	235	240	225	290
Test [NAT-1]	195	210	185	175	165	190	180	175

(5+5+10 = 20 marks)

4A. How is the plasma protein binding (PPB) of a new chemical entity determined? Mention the factors affecting PPB.

4B. What do you mean by Quantitative structure activity relationship? Explain with the help of graphs and equations.

4C. Discuss the problems associated with CoMFA.

((8+2)+6+4 = 20 marks)

5A. Explain the stepwise bond rotation in conformational analysis. Add a note on Monte Carlo and Metropolis method.

5B. Explain the following:

i) Rigid docking by shape complementarity

ii) Taft steric factor

iii) Rigid docking by matching the hydrogen bonding groups

(8+(5+2+5) = 20 marks)

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: PHARMACEUTICAL PROCESS CHEMISTRY (PCH 603)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Wednesday, May 29, 2013

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

Answer ALL Questions.

1. Explain the various techniques used for modifying and controlling reagent reactivity in chemical process development.

(20 marks)

2A. Write the methods used for the protection and deprotection of alcohols as acetals and ethers.

2B. What is phase transfer catalysis? Classify PTC systems and give a note on various phase transfer catalysts.

2C. Discuss about the practical problems encountered in classical work-up operations and mention the solutions.

(10+5+5 = 20 marks)

3A. Define and classify polymorphism. Mention its importance in pharmaceutical industry.

3B. Write a note on salt selection strategy. Discuss the techniques for the characterization of salts.

(10+10 = 20 marks)

4A. Write briefly about the principles of chemical process safety.

4B. What are the advantages of biocatalytic transformations performed in organic media? Classify the solvent systems used for enzyme catalyzed reactions .

4C. Explain the following in amide hydrolysis:

i) Esterase method
ii) Amidase method
iii) Acylase method
iv) Hydantoinase method
v) Lactamase method

(5+10+5 = 20 marks)

5A. Discuss about the preparation of ionic liquids.

5B. Discuss the effect of solvent on recrystallization process.

5C. Discuss effect of inclusion and occlusion on crystallization.

5D. Write a note on mechanism of nucleation.

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

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: ADVANCED ORGANIC CHEMISTRY (PCH 604)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Friday, May 31, 2013

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

Answer ALL the questions.

1A. Write two methods of preparation of quinoline. Compare the oxidations of quinoline and isoquinoline.

1B. What are functional group inter conversion and addition in synthetic planning? Add a note on protocol for synthetic design.

1C. Explain the retro synthesis and forward synthesis of Losartan.

(6+6+8 = 20 marks)

2A. What are aza – indolizines? Give a method of preparation of each one of them.

2B. Write the methods of preparation and reactions of pyrones.

2C. With example, explain the mechanism involved in Grignard reaction.

(5+10+5 = 20 marks)

3A. List out the reagents used in peptide synthesis and write a brief note on any two such reagents.

3B. Explain in detail asymmetric transfer hydrogenation.

3C. With example, explain the mechanism involved in Heck reaction.

(10+5+5 = 20 marks)

4A. Explain in detail the important chiral auxiliaries used for aldol reactions.

4B. Discuss Enantioselective dihydroxylation reactions of olefins.

4C. With example, explain the mechanism involved in Mitsunobu reaction.

(8+7+5 = 20 marks)

5A. What is retro Diels-Alder reaction? Explain.

5B. With example, explain the mechanism involved in Michael Addition reaction.

5C. Discuss thermodynamic resolution.

5D. Enumerate the uses of affinity chromatography.

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

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2013

SUBJECT: SPECTRAL AND CHROMATOGRAPHIC METHODS IN PHARMACEUTICAL CHEMISTRY (PCH 605)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY & PHARMACOGNOSY)

Monday, June 03, 2013

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

1A. Discuss the interpretation of HMBC spectrum of IPSENOL with help of a neat sketch.

1B. Write a short note on:

i) Deuterium exchange reactions in PMR

ii) Shift reagents and

iii) Anisotropic effect

1C. Mention the advantages of 2D NMR over 1D NMR and give an outline of the steps in 2D NMR experiment.

(5+10+5 = 20 marks)

2A. Discuss in detail about Fast atom bombardment ionization technique.

2B. Explain the principle and technique of carrying out gel electrophoresis.

2C. Assign the given ^{13}C chemical shift values to the appropriate carbons in the following compounds.

i) δ : 143.6 and 109.9 in Furan,

ii) δ : 150.06, 148.02, 135.6, 127.9, 126.19, 120.7, 127.54, 129.114, 129.175 in Quinoline

iii) δ : 156.6, 29.1, 127.9, 128.4, 125.7, 144.2 in ethyl benzene iv) δ : 54.1, 160, 114.1, 129.5 and 120.8 in Anisole.

(5+5+10 = 20 marks)

3A. List out the applications of mass spectrometric technique.

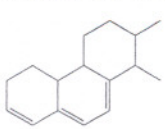
3B. Explain the steps involved in the determination of molecular composition from Mass spectrum.

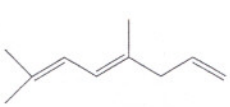
3C. Discuss the advantages and disadvantages of Gas-solid chromatography.

3D. Write in detail about gases used in GC.

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

4A. Calculate λ_{max} for the following:

i) 

ii) 

4B. Explain the following transitions:

i) n → π* ii) π → π* iii) n → σ* iv) σ → σ*

4C. Describe some characteristic IR absorption bands with their probable region and intensity for amides.

4D. In IR spectroscopy, explain about coupled vibrations and Fermi Resonance.

4E. Write the expected IR peaks for 4-nitro benzoic acid.

(6+4+3+4+3 = 20 m

5A. What is the need of derivatization in HPLC? Explain the techniques available with examples.

5B. With a neat labelled diagram explain the instrumentation of supercritical fluid chromatography.

5C. Discuss the effect of HPLC mobile phase strength on resolution.

(10+5+5 = 20 marks)