Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2011

SUBJECT: MEDICINAL CHEMISTRY – I (PCH 601)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Tuesday, May 24, 2011

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

✍ **Answer ALL questions.**

1A. Explain how bio isosterism and fragmentation of lead molecule help in the design of analogs.

1B. Discuss receptor cloning strategies.

(10+10 = 20 marks)

2A. What is oxidative Bio transformation? Explain how alkenes, aromatic compounds and amines are metabolised by first pass metabolism with suitable examples.

2B. How are mechanism based enzyme inhibitors developed?

2C. Enlist the desirable properties of radioligands.

(10+5+5 = 20 marks)

3A. Explain with suitable examples the concept of gene directed enzyme prodrug therapy.

3B. Discuss in detail the improvement of existing drugs as a strategy for new drug discovery.

(10+10 = 20 marks)

4A. Write a note on:

i) mix and split synthesis ii) solid supports for combinatorial synthesis.

B. Discuss briefly molecular mechanics and quantum mechanics the two methodologies associated with molecular modelling.

(10+10 = 20 marks)

5A. Explain the hydrophobic and electronic effects of a drug molecule on its biological activity with examples.

5B. Explain the energy components for inter molecular non covalent interactions in the Gas phase.

(10+10 = 20 marks)

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2011

SUBJECT: MEDICINAL CHEMISTRY – II (PCH 602)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Thursday, May 26, 2011

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

1A. Explain the method of isolation of cholesterol. Give any two identification tests of cholesterol.

1B. Elucidate the structure of an alkaloid with phenanthrene nucleus having potent analgesic activity.

(5+15 = 20 marks)

2A. How will you elucidate the structure of Umbelliferone and Xanthotoxin by spectral and chemical methods?

2B. Give the general procedure for the isolation of coumarins.

2C. Enlist the natural products obtained from marine source and give a brief account of any four of them.

(10+5+5 = 20 marks)

3. Discuss in detail, the isolation, chemistry, structural modifications and therapeutic applications of Taxol.

(20 marks)

4A. Discuss the importance of secondary metabolites with suitable examples.

4B. Write the biosynthetic pathway by which steroids are formed and explain the biosynthesis of Griseofulvin

4C. Outline the procedure involved in the isolation of Gingkolides.

(4+10+6 = 20 marks)

5A. With the help of two case history explain how natural products lead to the discovery of new drug candidates with examples of two cvs drugs and two beta lactam antibiotics.

5B. Give the structures of any four antiinflammatory compounds obtained from plants.

5C. Give the chemistry of any three anticancer agents derived from plant origin.

(10+4+6 = 20 marks)

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2011

SUBJECT: MEDICINAL CHEMISTRY –III (PCH 603)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Saturday, May 28, 2011

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

Answer ALL the questions.

1A. Incorporation of constrained amino acids is a tool in peptidomimetic drug design, explain.

1B. Write a note on *in vitro* protease inhibition assay.

1C. Write a notes on folic acid antagonists and alkylating agents.

(7+8+5 = 20 marks)

2A. Explain ACE Inhibitors with suitable examples.

2B. Write a note on transduction in resistance development.

2C. Explain any three chiral separation techniques giving suitable examples.

(8+6+6 = 20 marks)

3A. Write notes on:

i) Epitope Mapping

ii) Biotechnology products

iii) Protein engineering

3B. How irreversible inhibitors of H^+/K^+ ATPase designed? Explain with suitable examples.

((3+3+4)+10 = 20 marks)

4A. Discuss the various non-clinical toxicity studies carried out during drug development process.

4B. Enlist various types of microbial transformation reactions with suitable examples.

4C. Write a note on selection of microorganisms for microbial transformation.

4D. What are oligonucleotide therapeutics? How are they designed? Add a note on the design of antisense oligonucleotides.

(7+5+2+(1+2+3) = 20 marks)

5A. Describe the *in vivo* models for evaluation of anticancer activity.

5B. What are the benefits of patent protection? Write a note on patentable and non-patentable inventions.

5C. Write short notes on:

i) Therapeutic confirmatory trials

ii) Post marketing surveillance

(10+6+(2+2) = 20 marks)

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2011

SUBJECT: ADVANCED PHARMACEUTICAL CHEMISTRY (PCH 604)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Tuesday, May 31, 2011

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

Answer ALL the questions.

1A. Explain conformational analysis. Discuss the confirmations in open chain and six membered rings.

1B. What are the factors controlling the facial selectivity?

1C. Explain the term double asymmetric induction.

(12+4+4 = 20 marks)

2. Explain the following mechanism with suitable evidences.

i) E1cB ii) SET iii) SNi iv) Arenium ion mechanism

(5×4 = 20 marks)

3A. Explain the following with suitable examples.

i) Functionality level ii) Consonant circuits iii) Synthons

3B. Write a note on protocol for synthetic planning.

3C. Explain Claisen rearrangement giving its mechanism.

(10+5+5 = 20 marks)

4A. What are enolates? How are they generated? How is 'regio and stereo' selectivity controlled in enolate formations? Give examples.

4B. Write details of kinetic and thermodynamic controls in enolate formations giving examples.

(10+10 = 20 marks)

5A. Write four applications of each of the following reagents used in organic synthesis.

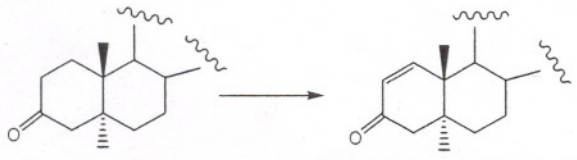
i) OsO_4 ii) DCC iii) Raney Nickel

5B. How are the following conversions effected?

i) Methyl crotonate ⟶ 4-bromomethyl crotonate

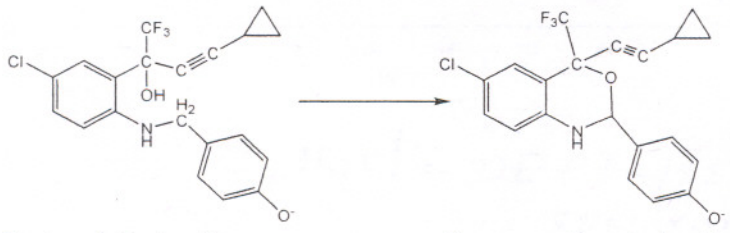
ii) O-nitrobenzaldehyde ⟶ o-nitrobenzylalcohol

iii)



3-oxo-5-α-steroid α-β-unsaturated keto steroid

iv)



Butynol derivative Benzoxazine derivative (Anti-HIV drug-Efavirenz)

(12+8 = 20 marks)

Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2011

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

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Thursday, June 02, 2011

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

Answer all the questions.

1A. Draw the mass spectrum of the following compounds and identify the different fragments, with appropriate comments

i) 2, 2-diethylpentane ii) benzaldehyde iii) anisole iv) nitrobenzene

1B. Explain LC-MS principle, instrumentation and techniques. Compare this methods with CI-MS and GC-MS.

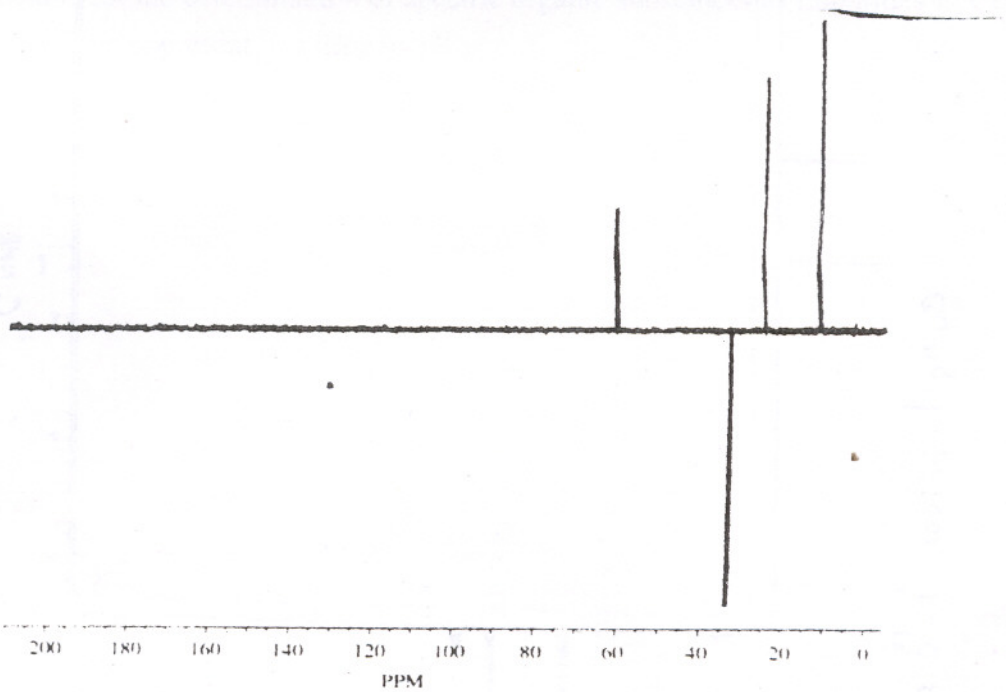
(8+12 = 20 marks)

2A. Draw the ^{1}H-NMR spectra of the following compounds

i) Ethyl benzene ii) cinnamaldehyde iii) acetophenone iv) o-toluidine

2B. Explain the basic principle and details of 2D experiments in NMR highlighting their outcome.

2C. Using the following set of DEPT-135, COSY and HETCOR spectra, provide a complete assignment of all protons and carbons for C_4H_9Cl (three spectra appended)



C_4H_9Cl – DEPT-135 spectrum.

3A. Write a note on the following:

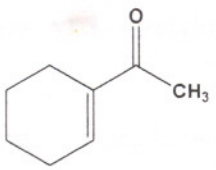
i) Vibrational coupling ii) FT-NIR iii) Hydrogen bonding in IR spectroscopy

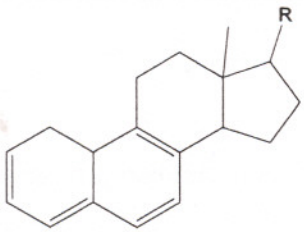
3B. Explain the theory of Size Exclusion Chromatography.

(15+5 = 20 marks)

4A. Discuss the UV spectra of benzene and its substitution derivatives with suitable examples.

4B. Applying Woodward Fieser rule calculate the absorption maxima for the following compounds.





4C. The position of absorption of acetone shifts in different solvents. 279nm (hexane), 272 (ethanol) and 264.5 nm (water), explain.

4D. Explain the assay of Vinblastine sulphate, Curcumin and Lupeol by HPLC.

(5+3+2+10 = 20 marks)

5A. What are the advantages of HPTLC over TLC and other methods?

5B. Elaborate on the following aspects of HPLC

i) Reciprocating pump ii) Injection mode and

iii) Measurement of column performance

5C. Give details for the determination of specific organic substances as impurities in Cephalexine and water content present in a drug by GC.

(5+12+3 = 20 marks)