Reg. No.										

MANIPAL UNIVERSITY

M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2012

SUBJECT: MEDICINAL CHEMISTRY – I (PCH 601)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Thursday, May 24, 2012

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

✍ **Answer ALL the questions.**

1A. Explain about generation of large libraries of peptide using mix and split method for solid phase synthesis.

1B. Explain drug discovery strategies with reference to selectivity screening and mass ligand screening.

(10+10 = 20 marks)

2A. Explain the parameters which describes the hydrophobicity of a compound and how to determine them.

2B. How homology modeling can be used to determine the 3D structure of a protein? Explain.

(10+10 = 20 marks)

3A. Explain the different strategies in receptor cloning.

3B. Describe Phase-II drug conjugation pathways. Add a note on the usefulness of study of metabolism in drug design.

(10+10 = 20 marks)

4A. Explain the design of prodrugs in detail.

4B. How do you classify enzyme inhibitors? Explain with examples, the rational design of one type of enzyme inhibitor from each class.

(10+10 = 20 marks)

5. Write note on:

5A. Information tools in drug discovery

5B. Microlitre plate method for antibacterial evaluation.

5C. DHFR-Trimethoprim interaction

5D. Receptor theories.

(5×4 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2012

SUBJECT: MEDICINAL CHEMISTRY – II (PCH 602)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Saturday, May 26, 2012

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

✍ **Answer all the questions.**

1A. Explain the biosynthesis of plant secondary metabolites produced through the shikimic acid pathway.

1B. Discuss the chemistry, mechanism of action and SAR of vinca alkaloids and taxol.

(10+10 = 20 marks)

2A. Explain the biosynthesis of aromatic polyketides.

2B. Outline the steps involved in the isolation of morphine.

2C. Write a note on anti-inflammatory agents obtained from natural sources.

(5+10+5 = 20 marks)

3A. How will you establish the nature and position of side chain in Cholesterol? Explain.

3B. Give the general methods for the elucidation of structure of Flavones.

(10+10 = 20 marks)

4A. List down the carbohydrate based excipients with their uses.

4B. Explain isolation, SAR, chemistry and uses of Artemisinin.

(5+15 = 20 marks)

5A. Discuss the chemistry of any four cardiovascular drugs derived from natural sources.

5B. Explain the chemistry of five antimicrobial agents from marine source.

(10+10 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2012

SUBJECT: MEDICINAL CHEMISTRY–III (PCH 603)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Tuesday, May 29, 2012

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

1A. Discuss the role of antisense oligonucleotides in antihypertensive treatment.

1B. Explain briefly, the mechanism of resistance and tolerance to antibiotics.

1C. Explain first order asymmetric transformation by giving an example.

(8+6+6 = 20 marks)

2A. Explain the concept of cyclization of peptides in peptidomimetic drug design.

2B. Discuss the principle and procedure involved in the evaluation of *in vitro* nitric oxide scavenging activity.

2C. List out the modification of bases in oligonucleotides therapeutics.

(8+7+5 = 20 marks)

3A. What is protein engineering? Explain the working of PCR in detail and give its applications. Add a note on site directed mutagenesis.

3B. Explain how reversible proton pump inhibitors are designed with suitable examples.

3C. Write chemistry of immunomodulators from plant sources.

((1+5+4)+5+5 = 20 marks)

4A. Discuss *in vivo* methods used for the screening of hepatoprotective agents and analgesic agents.

4B. Discuss the advantages of microbial transformation over other methods of transformation.

4C. Explain the practical aspects of microbial transformation. Add a note on microbial transformation of glycosides

(12+2+6 = 20 marks)

5A. Explain the various phases of clinical trials and their objectives.

5B. Write short notes on:

i) Criteria for patentability.

ii) Complete patent specification.

5C. Write a note on the following as immunosuppressants

i) Folic acid antagonists ii) alkylating agents

(7+(4+4)+5 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2012

SUBJECT: ADVANCED PHARMACEUTICAL CHEMISTRY (PCH 604)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Thursday, May 31, 2012

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

✍ **Answer ALL the questions.**

1A. Explain the significance of Cram's and Prelog's rules with suitable examples.

1B. Discuss free radical substitution mechanism on aromatic substrates.

(10+10 = 20 marks)

2A. What is asymmetric synthesis? Discuss with examples diastereoselectivity in aldol reactions, Grignard reactions and reactions through chiral enolates.

2B. Give a brief account on enamines and metallo-enamines.

(12+8 = 20 marks)

3A. Define nucleophiles with examples. Explain SRN1 and benzyne mechanisms with proper evidences.

3B. What do you mean by Logic centered molecular synthesis and direct associated approach?

(15+5 = 20 marks)

4A. Describe any four guidelines for disconnections in retro synthesis.

4B. Write short note on the following:

i) Pyrolytic cleavage

ii) Physical processes undergone by excited molecules

(10+10 = 20 marks)

5A. Explain the formation, stability, structure and fate of nitrenes.

5B. How will you bring about the following effects in the specified molecules? Write the structures involved.

i) Introduction of unsaturation in hydrocarbons.

ii) Aromatisation of steroids.

iii) Flavanone conversion into flavone.

iv) Dehydrogenation of lactam steroids.

5C. Write two examples for allylic bromination.

(10+8+2 = 20 marks)

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M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2012

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

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Saturday, June 02, 2012

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

✍ **Answer all the questions:**

1A. Explain the working principle of continuous wave NMR spectrometers and Fourier transform spectrometers and list the merits of the latter.

1B. The PMR signals of the protons of Cl-CH_2-CH_2-CH_2-Cl are reported to be located at 132 and 222 Hz downfield from TMS, when recorded on a 60 MHz instrument. Calculate the delta value. Will the value in Hz and ppm change, if recorded on a 100 MHz instrument?

1C. Discuss the HMQC and HMBC spectra of Ipsenol given below

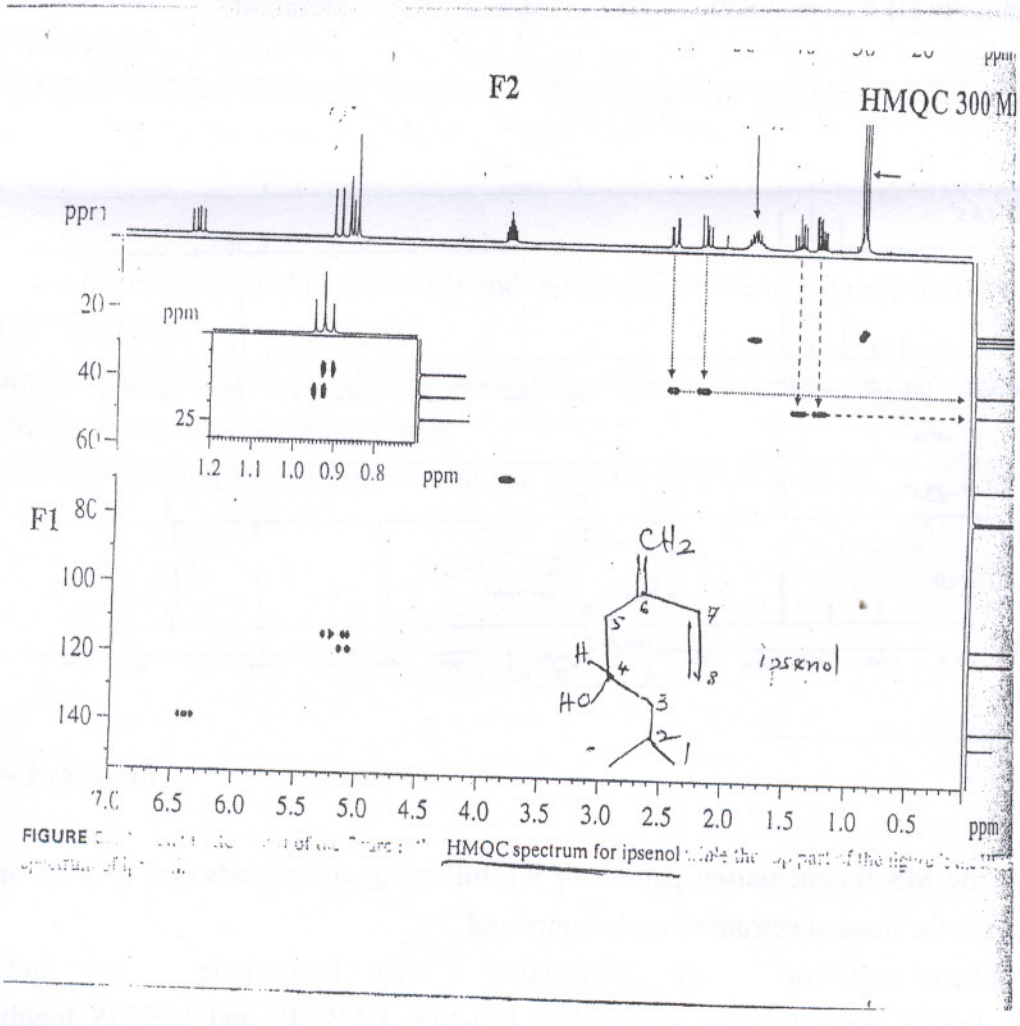
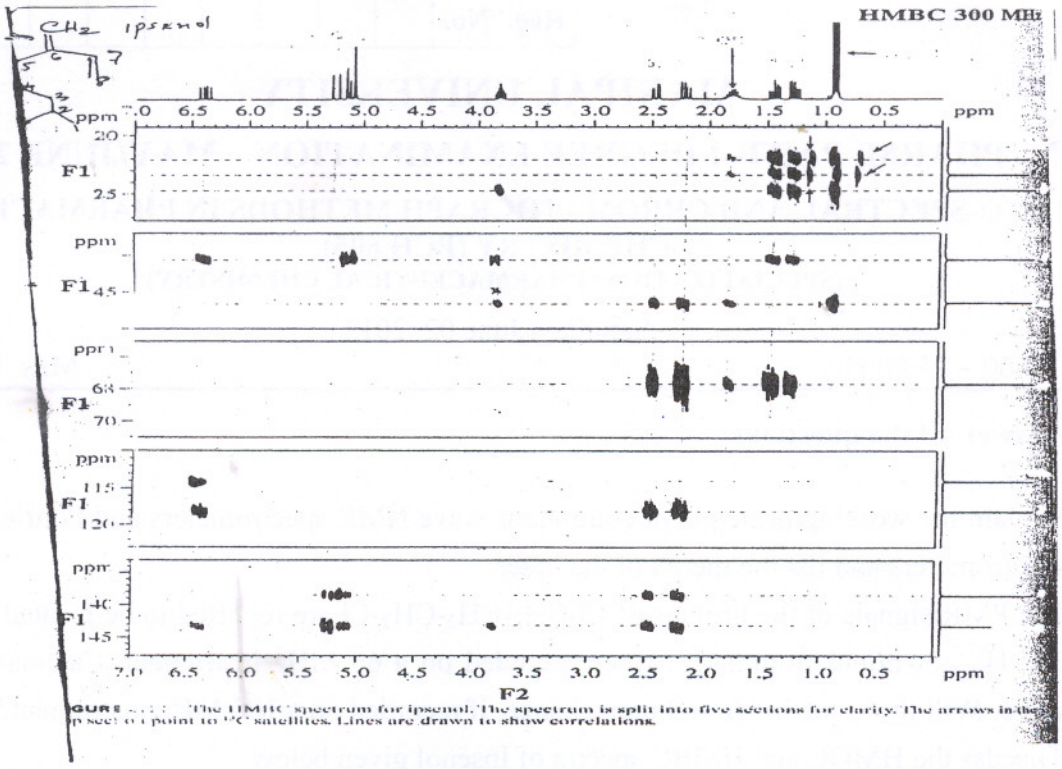
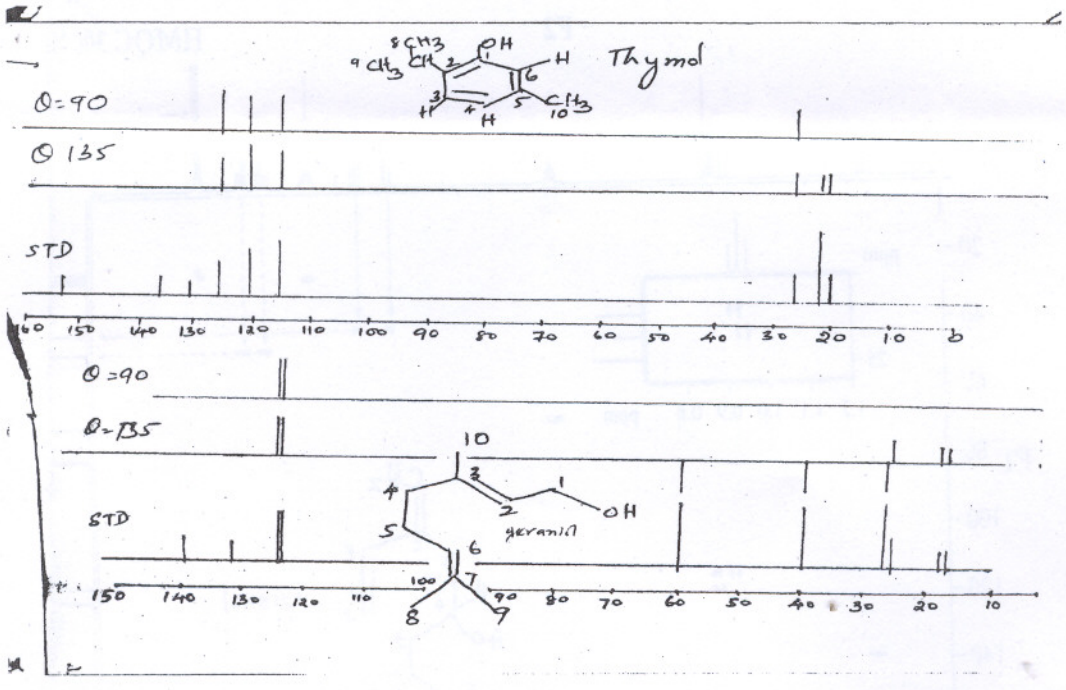


FIGURE [illegible] HMQC spectrum for ipsenol [illegible]



'The HMBC' spectrum for ipsenol. The spectrum is split into five sections for clarity. The arrows in the p sect o t point to '3C' satellites. Lines are drawn to show correlations.

1D. Explain the DEPT spectra of i) Thymol ii) Geraniol



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

2A. Write the MS fragmentation pattern of the following compounds and give an approximate sketch of the mass spectrum of each compound

i) Phenyl acetylene ii) 2-butanone iii) Benzamide iv) Indole

2B. Write briefly the principles involved in ESI-MS, FAB-MS and MS-MS highlighting the merits of each one. Give a few examples to support your answer.

(8+12 = 20 marks)

3A. Explain the following terminologies used explicitly in IR spectrometry

i) Group frequency region ii) Vibrational coupling

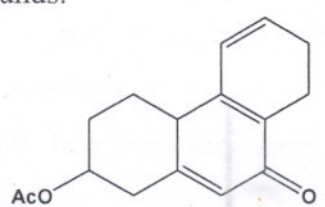
iii) Electronic effect iv) Hydrogen bonding

3B. In general, write the instrumentation and applications of SEC.

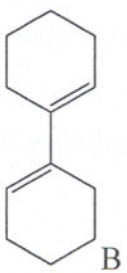
(10+10 = 20 marks)

4A. Explain the various transitions observed in alpha-beta unsaturated carbonyl compounds and how solvent polarity affects these transitions.

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



A



B

4C. With suitable example explain how geometrical isomers can be distinguished by UV spectroscopy.

4D. What does GC derivatization accomplish? Explain. Enlist the ideal qualities of the mobile phase used in gas chromatographic technique.

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

5A. Discuss the effect of mobile phase pH and mobile phase strength on separation of analytes by HPLC technique.

5B. Compare and contrast GC and HPLC techniques. With a neat diagram explain the functioning of Single Piston Reciprocating Pump.

5C. Write note on Sample application technique used for HPTLC analysis.

(5+10+5 = 20 marks)