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# MANIPAL UNIVERSITY

## M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2010

### SUBJECT: MEDICINAL CHEMISTRY – I (PCH 601)

(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Thursday, May 27, 2010

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

**Answer ALL questions.**

1A. Explain Phase I and Phase II reactions with suitable examples.

1B. Write the types of searching performed in the management of information in drug discovery.

1C. Explain the types of assays performed using HTS.

(10+5+5 = 20 marks)

2A. How are pro-drugs designed? Mention their applications. Add a note on their use in chemotherapy of cancer.

2B. Explain solid phase chemistry with suitable examples. Mention the commonly used solid supports.

((4+3+3)+(8+2) = 20 marks)

3A. How does COMFA help in 3D-QSAR?

3B. What are the advantages of n-octanol as solvent in the determination of log P?

3C. How do 2D and 3D NMR methods help in obtaining 3D-structure?

(7+3+10 = 20 marks)

4A. Explain the different methods used in lead optimization.

4B. What are receptors? Explain:

i) Lock and Key ii) Occupancy iii) Macromolecular perturbation drug-receptor theories.

(10+10 = 20 marks)

5A. Explain biotin-avidin and DHFR-trimethoprim interactions.

5B. How are covalently binding enzyme inhibitors developed?

(10+10 = 20 marks)

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# MANIPAL UNIVERSITY

## M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2010

### SUBJECT: MEDICINAL CHEMISTRY – II (PCH 602)

### (SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)

Friday, May 28, 2010

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

**Answer ALL questions.**

1. Explain the structural elucidation of cholesterol by chemical and spectral methods.

(20 marks)

2A. "Natural products as leads for the future design of new drugs". Justify the statement with examples.

2B. Write a note on natural products as anticancer agents.

(10+10 = 20 marks)

3A. Explain briefly the chemistry, structural modifications and therapeutic applications of artemisinin.

3B. Explain antiinflammatory compounds derived from plants with two examples.

(15+5 = 20 marks)

4A. Describe acetate – malonate and Shikimic acid pathways of biosynthesis of plant secondary metabolites.

4B. What are the important furanocoumarins isolated from plants?

4C. Discuss the method of isolation of Rutin.

(12+4+4 = 20 marks)

5A. Elucidate the structure of Vincristine and Vinblastine by spectral methods.

5B. Briefly discuss the therapeutic utility of marine products.

(12+8 = 20 marks)

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# MANIPAL UNIVERSITY

## M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2010

### SUBJECT: MEDICINAL CHEMISTRY –III (PCH 603)

**(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)**

Saturday, May 29, 2010

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

**Answer ALL questions.**

1A. Explain amide bond isosteres in peptidomimetic drug design.

1B. How one can achieve resolution through the formation of diastereo isomers and molecular complexes?

1C. Discuss the chemical approaches in the treatment of hypertension.

1D. How do you combat bacterial drug resistance?

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

2A. Explain the structure activity relationship of proton pump inhibitors. Add a note on their test assay.

2B. How do you obtain genetically engineered proteins?

2C. How do you use enzyme and receptor as drug targets?

(10+5+5 = 20 marks)

3A. Explain the role of oligonucleotides in the design of newer therapeutics.

3B. What is second line defence? List out the major functions of adaptive immune system.

3C. Explain how anti cancer agents are used as immune suppressants.

(10+7+3 = 20 marks)

4A. Explain the types of microbial transformation reactions giving examples.

4B. Describe the various stages involved in obtaining patents.

4C. Write a short note on nonclinical toxicity studies.

(7+7+6 = 20 marks)

5A. Explain the importance of phosphodiesterase inhibition assay and write the method in detail.

5B. Explain the *in vivo* anticancer screening methods in detail.

(10+10 = 20 marks)

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# MANIPAL UNIVERSITY

## M. PHARM. PART–I DEGREE EXAMINATION – MAY/JUNE 2010

### SUBJECT: ADVANCED PHARMACEUTICAL CHEMISTRY (PCH 604)

**(SPECIALIZATION: PHARMACEUTICAL CHEMISTRY)**

Monday, May 31, 2010

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

**Answer ALL questions.**

1A. Why is nucleophilic substitution difficult on unsubstituted benzene? Explain SN Ar and $SN_1$ mechanisms with examples in aromatic nucleophilic substitutions.

1B. Explain the mechanisms involved in the following conversions.

i) Indole to indole – 3 – aldehyde

ii) 1 – chloro octane to 1 – cyano octane

iii) Benzophenone oxime to benzanilide.

(10+10 = 20 marks)

2A. What are the strategies of Woodward, Brown and Turner for the total synthesis of Prostaglandin $F_{2\alpha}$? What is the protocol for synthetic design?

2B. Explain free radical substitution mechanism at an aromatic substrate. What is Hunsdiecker reaction?

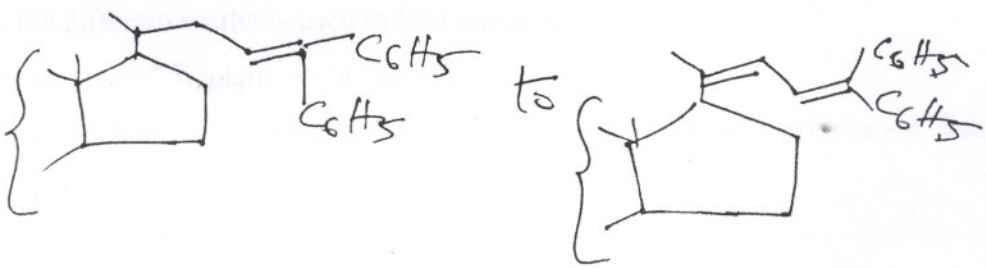
2C. How are the following conversions effected?

i) $RNH_2$ to $RNHC_0R$ at 0°C

ii) Penicilloic acid to Penicillin – V

iii) O – nitrobenzaldehyde to O – nitrobenzoyl alcohol

iv)

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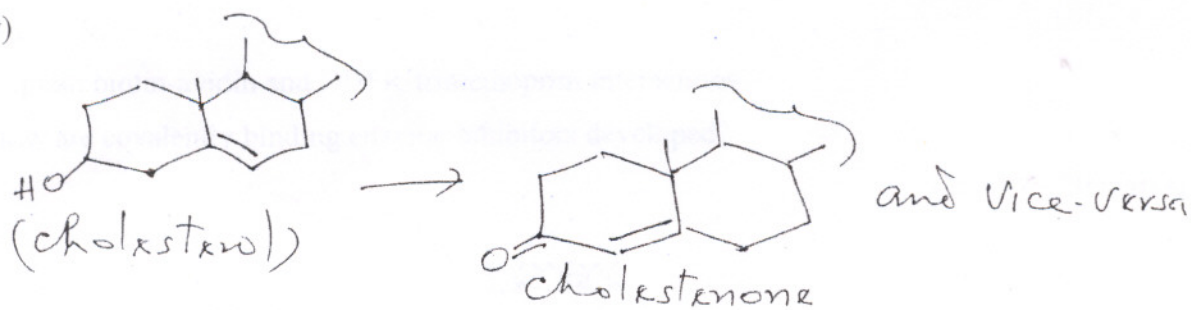


(10+5+5 = 20 marks)

3A. Explain the generation, fate and significance of carbenes.

3B. Write a brief account of enamines and metallo-enamines.

(10+10 = 20 marks)

4A. Explain the significance of Cram's and Prelog's rules with suitable examples.

4B. What is asymmetric synthesis? Discuss with examples diastereoselectivity in aldol reactions, Grignard reactions and reactions through chiral enolates.

(10+10 = 20 marks)

5A. Discuss photochemistry of Carbonyl compounds.

5B. Explain 'O' versus 'C' alkylation of enolates.

(15+5 = 20 marks)