THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

(LP 2040) SEPTEMBER 2019 **Sub. Code: 2040**

B.PHARM. DEGREE EXAMINATION
PCI Regulation – SEMESTER IV
PAPER II – MEDICINAL CHEMISTRY – I

Q.P. Code: 562040

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. a) Explain how the following physicochemical properties affect drug action.
   i) Hydrogen bonding ii) Geometrical isomerism iii) Protein binding
   b) Define the process of metabolism? Illustrate the factors affecting metabolism of dugs.
2. a) What are drug receptors? Write a note on the different types of receptors available for drug action.
   b) Define and classify adrenergic antagonists with suitable examples. Write the synthesis and uses of i) Tolazoline ii) Propranolol.
3. a) What are general anaesthetics? Classify them with suitable examples.
   b) Explain the mechanism of action of general anaesthetic agents. Write the synthesis of halothane.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Describe the SAR of sympathomimetic agents.
2. Write a note on synthetic cholinergic blocking agents.
3. Give synthesis and uses of Salbutamol and Ibuprofen.
4. Present the SAR of phenothiazines.
5. Describe about anticonvulsants with appropriate chemical structures.
6. Write a note on narcotic analgesics.
7. Enumerate the facts about anti-inflammatory agents. Write the structure and uses of : i) Mefenamic acid ii) Diclofenac.
8. Write a short note on anti-psychotic drugs.
9. Arrive biosynthesis and catabolism of acetyl choline.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Chelation.
2. Prodrug.
3. Mechanism of action of barbiturates.
4. Cholinesterase reactivator.
5. Catecholamines.
6. Mechanism of action of sedatives and hypnotics.
7. Cholinergic receptors.
8. Clinical uses of diazepam.
9. Write the structure of methyldopa.
10. Catabolism.

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THE TAMIL NADU Dr.M.G.R. MEDICAL UNIVERSITY

(LQ 2040) MARCH 2020 **Sub. Code: 2040**

B.PHARM. DEGREE EXAMINATION
PCI Regulation – SEMESTER IV
PAPER II – MEDICINAL CHEMISTRY – I

Q.P. Code: 562040

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. **(2 x 10 = 20)**

1. a) What are sedative and hypnotics? Classify sedative and hypnotics.
   b) Discuss the structural activity relationship of benzodiazepines and outline the synthesis of Diazepam.
2. Explain in detail about Phase II metabolism reactions with examples.
3. Discuss the structural activity relationship of β phenyl ethyl amines of direct acting sympathomimetics.

II. Write notes on: Answer any SEVEN questions. **(7 x 5 = 35)**

1. Explain the biosynthesis, metabolism and physiological role of adrenergic neurotransmitters.
2. Discuss the structural activity relationship of anticonvulsants and outline the synthesis of ethosuximide.
3. Explain the mechanism of nonsteroidal anti-inflammatory agents and outline the synthesis of Ibuprofen.
4. Explain the factors affecting drug metabolism including stereochemical aspects.
5. Discuss the structural activity relationship of β blockers and outline the synthesis of propranolol.
6. What are the general anaesthetics? Classify general anaesthetics with examples.
7. a) Explain the biosynthesis and catabolism of acetylcholine
   b) Explain the muscarinic and nicotinic receptors and their distribution.
8. What are narcotic analgesics? Classify narcotic analgesics and outline the synthesis of fentanyl citrate.
9. Classify sympathomimetic agents and outline the synthesis of salbutamol.

III. Short answers on: Answer ALL questions. **(10 x 2 = 20)**

1. Write the structure and medicinal uses of prazocine.
2. Write briefly on the mechanism of action of phenothiazine.
3. Give the structure and medicinal uses of any one fluorobutyrophenones.
4. What is Easson Stedman hypothesis?
5. Write briefly on SAR of imidazoline nucleus of α adrenergic receptor agonist.
6. Explain the mechanism of action of β-haloalkylamines of adrenergic receptor antagonist.
7. Explain why non selective β blockers are contraindicated for the patients in conditions like Asthma and bronchitis?
8. Write the structure, numbering and uses of codeine.
9. Write briefly on mechanism of action of phenytoin.
10. What happens on replacement of oxygen atom by sulphur atom on carbon–2 of barbiturates structure? Give its actions and uses.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[BPHARM 0321] **MARCH 2021** **Sub. Code: 2040**

(SEPTEMBER 2020 EXAM SESSION)

B. PHARMACY DEGREE EXAMINATION

PCI Regulation SEMESTER – IV

PAPER II – MEDICINAL CHEMISTRY I

Q.P. Code : 562040

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. **(2 x 10 = 20)**

1. Explain in detail the structural activity relationship of morphine and related compounds.
2. What are cholinergic agonists? Discuss the structural activity relationship of cholinergic agonist. Outline the synthesis of Neostigmine.
3. Explain the following physiochemical properties related to the biological action.
   a) Hydrogen bonding b) Optical and geometrical isomerism.

II. Write notes on: Answer any SEVEN questions. **(7 x 5 = 35)**

1. Classify cholinergic blocking agents. Outline the synthesis of Dicyclomine hydrochloride.
2. Explain the mechanism of action of Barbiturates and outline the synthesis of barbital.
3. Outline the synthesis of carbamazepine and mention its uses.
4. Write a note on ultra short acting barbiturates and outline the synthesis of Methohexital sodium.
5. Explain Phase I metabolism of hepatic cytochrome P 450 system.
6. Write a note on cardio selective β_1 blockers and write the structure and medicinal uses of any two drugs.
7. Explain protein binding with examples.
8. Discuss the structural activity relationship of Phenotiazine.
9. a) Outline the synthesis of Chlorpromazine and its medicinal uses.
   b) Write the structure of Trifluperazine and Thioridazine and mention their uses.

III. Short answers on: Answer ALL questions. **(10 x 2 = 20)**

1. Sketch the structure of clonidine and its medicinal use.
2. What happens on the replacement of N-H group at position 1 of the hydantoin system with an oxygen atom. Write the structure of any one drug from this system and its uses.
3. Sketch the structure of naloxone and mention its uses.
4. Outline the synthesis of phenylphrine and mention its uses.
5. Sketch the structures of imidazoline nucleus of α adrenergic antagonist.
6. What happens on the replacement of N-H moiety of phenothiazine ring with a carbon atom doubly bonded to propylidene side chain. Sketch the structure and its stereo selectivity.
7. Explain briefly on the stereo selectivity of β blocking agents.
8. Write the structure of pralidoxime hydrochloride and its uses.
9. Sketch the structure of naproxen and piroxicam and its uses.
10. Sketch the structure of procyclidine and its uses.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[BPHARM 0122] JANUARY 2022 Sub. Code: 2040
(MARCH 2021 EXAM SESSION)

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 – SEMESTER IV
PAPER II – MEDICINAL CHEMISTRY I
Q.P. Code : 562040

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. a) List out the physicochemical properties that influence biological action. With suitable examples explain how the following properties affect drug absorption. (6)
   i) Solubility ii) Ionization iii) Hydrogen bonding.
   b)Write briefly on enzyme system involved in I Phase metabolism of drugs. (4)
2. a) What are adrenergic neurotransmitters? Classify them with suitable examples.(3)
   b) Write in detail about biosynthesis and catabolism of catecholamines. (3)
   c) Mention the use and synthesis of salbutamol (4)
3. a) Define and classify sedatives and hypnotics with suitable examples. (3)
   b) Summarize the SAR of benzodiazepines. (3)
   c) Write the synthesis and use of diazepam. (4)

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Write a note on the different types of receptors meant for drug action.
2. Outline the various factors that influence metabolism.
3. Write a note on cholinergic blocking agents.
4. Write a note on phenothiazines as antipsychotic agents.
5. Define beta-adrenergic blocking drugs with structural representation.
6. What are anticonvulsants? Write the SAR of barbiturates.
7. Define general anaesthetics with a mention on their mechanism of action. Write the structure and uses of i) Methohexital Sodium ii) Ketamine Hcl.
8. Summarise the SAR of beta-blockers.
9. What are NSAIDs? Write the synthesis of Ibuprofen.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Agonist.
2. Ferguson principle.
3. Clinical uses of alprazolam.
4. Protein binding of drugs.
5. Structure and uses of phenobarbitone.
6. Dissociative anaesthetics.
7. Cholinergic receptors.
8. Xenobiotics.
9. Structure and use of phenytoin.
10. Synthesis of aspirin from benzoic acid.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[BPHARM 0522] MAY 2022 Sub. Code: 2040

(SEPTEMBER 2021 EXAM SESSION)

B. PHARMACY DEGREE EXAMINATION

PCI Regulation SEMESTER - IV

PAPER II – MEDICINAL CHEMISTRY I

Q.P. Code : 562040

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. a) Discuss the structural activity relationship of non narcotic anti inflammatory agents.
   b) Outline the synthesis of Mefenamic acid and its uses.
2. Explain the mechanism of action of general anaesthetics and outline the synthesis of ketamine hydrochloride and halothane.
3. a) Discuss the structural activity relationship of barbiturates.
   b) Sketch the structure of Glutethimide and meprobamate and its medicinal uses.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Explain the formation of action potential and outline the synthesis of phenytoin.
2. Outline the synthesis of methadone hydrochloride and its uses.
3. Describe the chemistry of irreversible inhibitors of cholinesterase and their mode of action.
4. Write a note on β blockers with α1 receptor antagonist activity with chemical structure and its uses.
5. Write a note on inhalation anaesthetics with their structure and medicinal uses.
6. Explain the structural considerations of solanaceous alkaloids.
7. Explain chelation and bioisosterism with examples.
8. Outline the synthesis of iprotropium bromide and mention its uses.
9. a) What happens when dihydromorphinone is substituted with C-14 hydroxyl group. Sketch the resulting structure and its medicinal uses.
   b) Sketch the structure of diphenoxylate and its uses.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. What happens when catechol moiety is replaced by resorcinol structure in β Phenyl ethyl amines of sympathomimetic agents? Sketch the resulting compounds with its medicinal uses.
2. Explain Hydrogen bonding with structural representations.
3. Write any two indirect acting sympathomimetics with its chemical structure and uses.
4. What happens when branched, cyclic and unsaturated chain substituted at C-5 of barbiturates. Sketch the structure of any two drug and its uses.
5. The benzodiazepine which has polar groups by itself is converted into non polar compound by rapid loss of water and decarboxylation results in long half life. Sketch the structure of the resulting compound and its uses.
6. Write the structure of terbutaline and isoproterenol and its uses.
7. Sketch the structure of lorazepam and explain why it produces increased activity.
8. Sketch the structure of clonazepam and valproic acid and its uses.
9. Give the structure, IUPAC name and medicinal uses of alprazolam.
10. What happens on α substitution on choline moiety in cholinergic agonist?

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[BPHARM 0122] OCTOBER 2022 Sub. Code: 2040
(MARCH 2022 EXAM SESSION)

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 – SEMESTER IV
PAPER II – MEDICINAL CHEMISTRY I
Q.P. Code : 562040

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Describe in brief the biosynthesis, release, uptake and metabolism of acetylcholine.
2. Outline the synthesis and medicinal uses of (a) Ipratropium bromide (b) Neostigmine (c) Carbachol (d) Dicyclomine hydrochloride.
3. Explain the various types of Phase I biotransformation pathways.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Discuss in detail the various stereochemical aspects of drug metabolism.
2. Discuss the chemistry and structural activity relationship of beta-adrenergic blocking agents with examples.
3. Outline the synthesis and medicinal uses of (a) Propranolol (b) Tolazoline.
4. Classify antipsychotics and write the structure and uses of (a) Prochlorperazine maleate (b) Thiothixene.
5. Describe in detail the structural activity relationship of hydantoin class of anticonvulsant drugs.
6. Classify general anaesthetics. Outline the synthesis of halothane.
7. Describe the synthesis and medicinal uses of (a) Fentanyl citrate (b) Methadone hydrochloride.
8. Write a note on structural activity relationship of 3,5-pyrazolidine dione derivatives used as anti-inflammatory agents.
9. Sketch the synthetic route for Mefenamic acid.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Write any two factors affecting solubility.
2. Write the structure and uses of (a) Phenacetin (b) Sulindac.
3. What are adrenergic receptors?
4. Write the structure and uses of Pilocarpine.
5. Give the structure of (a) Chlordiazepoxide (b) Meprobamate.
6. Outline the synthesis of Phenytoin.
7. Write the structure of any two oxazolidine diones.
8. Mention the different stages of anaesthesia.
9. Write the structure and uses of (a) Indomethacin(b) Diclofenac.
10. List out the ideal characteristics of general anaesthetics.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 0323] MARCH 2023 Sub. Code: 2040
(SEPTEMBER 2022 EXAM SESSION)

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 – SEMESTER IV
PAPER II – MEDICINAL CHEMISTRY I

Q.P. Code: 562040

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Describe in brief the biosynthesis, release, uptake and metabolism of Norepinephrine.
2. Discuss the following metabolic reactions with examples (a) Acetylation (b) Glucuronidation (c) Sulfation.
3. Classify anti-inflammatory agents with examples for each class. Explain the structural activity relationship and mode of action of anthranilic acid derivatives.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. What is bioisosterism? How is it useful in the design of drugs?
2. Discuss the chemistry and structural activity relationship of alpha-adrenergic blocking agents with examples.
3. Explain the biosynthetic pathway of prostaglandins.
4. Classify parasympathomimetic agents and discuss the structural activity relationship.
5. Describe in detail ring analogues of phenothiazine class of antipsychotic drugs.
6. Classify sedatives and hypnotics. Outline the synthesis of diazepam.
7. Write the synthesis and medicinal uses of (a) Methohexital sodium (b) Ketamine hydrochloride.
8. Discuss the structural activity relationship and mechanism of action of morphine.
9. Write a brief note on benzodiazepines as anticonvulsant agent.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. What is partition coefficient?
2. Outline the structure and uses of Naproxen.
3. What are cholinergic receptors?
4. Write the structure and uses of Tropicamide.
5. Give the structure of (a) Phenobarbital (b) Paraldehyde.
6. Outline the synthesis of Chlorpromazine hydrochloride.
7. Write the structure of any two hydantoins.
8. What is dissociative anaesthesia?
9. Write the synthesis of Ibuprofen.
10. Write the structure and uses of Enflurane.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 0823] AUGUST 2023 Sub. Code: 2040
(MARCH 2023 EXAM SESSION)

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 – SEMESTER IV
PAPER II – MEDICINAL CHEMISTRY I

Q.P. Code: 562040

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Classify NSAIDS. Write the structure, uses and synthesis of Ibuprofen.
2. Explain the SAR of sympathomimetics. Write the synthesis of salbutamol.
3. Define and classify narcotic analgesics. Elaborate the synthesis of methadone HCI.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. SAR of anti convulsants.
2. Define dissociative anaesthetic? Write the name, structure synthesis of any one.
3. Write the structure, MOA & uses of Dopamine.
4. Describe about cholinesterase re-activators.
5. Explain the structure, Mechanism of action and uses of Codeine.
6. Write a note on chelation and solubility.
7. SAR of phenothiazines.
8. Structure and uses of lorazepam.
9. Classify parasympathomimetic agents with examples.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Define sedatives and hypnotics.
2. Uses of atenolol and terbutaline.
3. Geometrical isomerism.
4. Structure of valproic acid and aspirin.
5. Solanaceous alkaloids.
6. Write the examples of non selective beta adrenergic blockers.
7. Uses of cholinomimetic alkaloids.
8. Mechanism of action of reserpine.
9. Structure and uses of Carbachol.
10. Anti Pyretics.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 1223] DECEMBER 2023 Sub. Code: 2040
(SEPTEMBER 2023 EXAM SESSION)

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 – SEMESTER IV
PAPER II – MEDICINAL CHEMISTRY I

Q.P. Code: 562040

Time: Three hours **Maximum: 75 Marks**

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Enumerate the various physicochemical properties that influence the biological activity and explain any two of them in detail.
2. Classify antipsychotics giving two examples with structures for each class. Write the structural activity relationship and mode of action of phenothiazine antipsychotics.
3. Classify sympathomimetic agents and describe their mode of action and structural activity relationship.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Describe the Phase I Metabolism.
2. Write a note on alpha adrenergic blockers.
3. Outline the synthesis and medicinal uses of (a) Phenylephrine (b) Salbutamol.
4. Write a note on cholinergic receptors and their distribution.
5. Describe in detail the structural activity relationship of cholinolytic agents.
6. Outline the synthesis of Carbamazepine.
7. Write a brief note on narcotic antagonists.
8. Describe in detail the structural activity relationship of barbiturates class of sedatives and hypnotics.
9. Write the synthesis and medicinal uses of Ethosuximide.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. What are classical bioisoteres?
2. Give the structure of Piroxicam and Acetaminophen.
3. Write examples of direct acting sympathomimetic agents.
4. Write the structure and uses of Propranolol.
5. Give the structure of (a) Thioridazine hydrochloride (b) Haloperidol.
6. Outline the synthesis of Barbital.
7. Write the structure of any two succinimides.
8. What is preanaesthetic medication?
9. Write the structure and uses of Antipyrine and Phenylbutazone.
10. List out the opioid receptors.

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