BALAJI COLLEGE OF PHARMACY

Approved by PCI, New Delhi & Affiliated to JNTUA Ananthapuramu.

Rudrampeta Bypass, Sanapa Road, Ananthapuramu, Andhra Pradesh -515002

Academic Year: 2024 – 2025

Class: III YEAR I SEM

Program: B.Pharmacy

Name of the Course: **MEDICINAL CHEMISTRY-II**

COURSE FILE CONTENTS

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Vision

To be recognized as an Institute of excellence, imparting quality pharmacy and healthcare education, producing competent professionals with research orientation and entrepreneurial attitude, capable of meeting the demands of the Industry and serving the Society.

Mission

M1: To provide a conducive environment for student centric teaching - learning process to achieve academic excellence.

M2: To foster among students the attitude of research, innovation and entrepreneurship.

M3: To establish effective Industry – Institute interaction with the Pharmaceutical and Healthcare sectors.

M4: To inculcate ethical and moral values among students to make them responsible to meet the needs of the society.

BALAJI COLLEGE OF PHARMACY, ANANTHAPURAMU

COURSE FILE

OF

MEDICINAL CHEMISTRY-II

(Based on Outcome Based Education)

FACULTY DETAILS

Name of the Faculty: Mr. G.THIRUMALA ROOPESH M.Pharm., (Ph.D)
Designation: Associate Professor
Department: Department of Pharmaceutical Chemistry

COURSE NAME: MEDICINAL CHEMISTRY-II – Theory
COURSE CODEL BP501T (THEORY)
PROGRAM: B. Pharm. (Regular/ Lateral)
SEMESTER: FIRST
YEAR TAUGHT: 2024
Academic Year: **2024-2025**

Scope & Objectives:

Scope:

This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs. The syllabus also emphasizes on chemical synthesis of important drugs under each class.

Objectives:

Upon completion of the course the student shall be able to

1. Understand the chemistry of drugs with respect to their pharmacological activity
2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
3. Know the Structural Activity Relationship (SAR) of different class of drugs
4. Write the chemical synthesis of some drugs

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ACADEMIC CALENDER

File No.SCHE-JNTA/910/2024-JNTUA-EHE73

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR, ANANTHAPURAMU

ACADEMIC CALENDAR 2024-25

B.Pharm III Year I & II Semesters

(for 2022 admitted batch)

Description	From To	No. of weeks/days
I Semester		
Commencement of Class work	29.07.2024	-
Instruction Period for the Semester	29.07.2024 to 23.11.2024	(17 weeks)
Examinations:		
I Mid-term Examinations	23.09.2024 to 25.09.2024	(03 Days)
II Mid-term Examinations	25.11.2024 to 27.11.2024	(03 Days)
End laboratory Examinations:	02.12.2024 to 07.12.2024	(01 week)
End Theory Examinations:	09.12.2024 to 21.12.2024	(02 weeks)
Commencement of Class Work for III Year B.Pharm II semester	23.12.2024 (Monday)	
Declaration of results for III-I	18.01.2025	

II Semester		
Commencement of Class work	23.12.2024	-
Instruction Period for the Semester	23.12.2024 to 19.04.2025	(17 weeks)
Examinations:		
I Mid-term Examinations	17.02.2025 to 19.02.2025	(03 Days)
II Mid-term Examinations	17.04.2025 to 19.04.2025	(03 Days)
End laboratory Examinations:	21.04.2025 to 26.04.2025	(01 week)
End Theory Examinations:	28.04.2025 to 09.05.2025	(02 weeks)
Commencement of Short-Term Internship/Summer vacation	12.05.2025 to 12.07.2025	(02 Months)
Commencement of Class Work for IV Year B.Pharm I semester	14.07.2025 (Monday)	
Declaration of results for III-II	02.06.2025	

Note:

- The Mid-term Examinations should be conducted and completed as per the schedule given.
- For slippage of 100 instruction days in 17 weeks due to any unavoidable reasons, compensation can be made by conducting class work on second Saturdays, Sundays and other holidays, except on National Holidays and important festivals.

Digitally Signed by Eddula Keshava Reddy
Date: 27-06-2024 13:12:48
Reason: Approved

Date: 27.06.2024

DIRECTOR OF EVALUATION

Programme Outcomes (PO)

PO 1: Pharmacy knowledge: Apply the knowledge ofbasic molecular biology, drug mechanism, science of various systems of human body, fundamental principles of analytical chemistry, preparation of different dosage forms, natural drugs and monographs of inorganic drugs in pharmacy.

PO 2: Planning abilities: Demonstrate effective planning abilities in pharmaceutical industry through resource & time management, delegation skills and organizational skills to achieve goal.

PO 3: Problem analysis: Develop ability for in-depth analytical and critical thinking in order to identify, formulate, solve the issues related to Pharmaceutical Industry, Regulatory Agencies, Hospital and Community Pharmacy.

PO 4: Modern tool usage: Apply the foundation of pharmaceutical science in formulation technology, synthetic knowledge of modern pharmacy computing tools uses as per the requirement of pharmaceutical sectors within the constraints.

PO 5: Leadership skills: Exhibit leadership quality, team spirit with motivational capability when planning for fulfilment of professional and social responsibilities to facilitate improvement in health and wellbeing.

PO 6: Professional identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, educators, managers, employers, employees).

PO 7: Pharmaceutical ethics: Demonstrate behaviour that recognizes cultural and personal variability in values, communication and lifestyles. Honour personal values and apply ethical principles in professional and social contexts. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

PO 8: Communication: Demonstrate effective communication with the pharmacy community and with society at large such as being able to comprehend and write effective reports, make effective presentations and documentation to give and receive clear instructions.

PO 9: The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

PO 10: Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 11: Entrepreneurial skill: Exhibit effective entrepreneurial skills in the field of pharmacy to analyse the market potential and grab opportunities**.**

PO 12: Lifelong learning: Develop an aptitude for lifelong learning in the broadest context of technological change. Develop the decision-making ability for selection of higher studies in pharmaceutical sciences and allied fields.

COURSE OUT COMES (CO):

B. PHARM- COURSE OUTCOMES (PCI) REGULATION: R19

CO-1: Understand the chemistry of drugs with respect to their pharmacological activity

CO-2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs

C0-3. Know the Structural Activity Relationship of different class of drugs

CO-4. Study the chemical synthesis of selected drugs.

CO-5: Study the chemical synthesis of selected drugs and Structural Activity Relationship of different class of drugs.

SPECIFIC LEARNING OUTCOMES (SLO) SEMESTER I (PCI)

BP102T: PHARMACEUTICAL ANALYSIS (Theory)		
SLO1/1	UNIT I	Understand the chemistry of drugs with respect to their pharmacological activity
SLO2/1	UNIT II	Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
SLO3/1	UNIT III	Know the Structural Activity Relationship of different class of drugs
SLO4/1	UNIT IV	Study the chemical synthesis of selected drugs.
SLO5/1	UNIT V	Study the chemical synthesis of selected drugs and Structural Activity Relationship of different class of drugs.

SYLLABUS

BP501T. MEDICINAL CHEMISTRY – II (Theory) 45 Hours

Course Content: Study of the development of the following classes of drugs, Classification, mechanism of action, uses of drugs mentioned in the course, Structure activity relationship of selective class of drugs as specified in the course and synthesis of drugs superscripted (*)

UNIT I **10 Hours**

Antihistaminic agents: Histamine, receptors and their distribution in the human body
H_1–antagonists: Diphenhydramine hydrochloride*, Dimenhydrinate,Doxylamines cuccinate, Clemastine fumarate, Diphenylphyraline hydrochloride,Tripelenamine hydrochloride, Chlorcyclizine hydrochloride, Meclizinehydrochloride, Buclizine hydrochloride, Chlorpheniramine maleate, Triprolidine hydrochloride*, Phenidamine tartarate, Promethazine hydrochloride*,Trimeprazine tartrate, Cyproheptadine hydrochloride, Azatidine maleate, Astemizole, Loratadine, Cetirizine, Levocetrazine Cromolyn sodium
H_2-antagonists: Cimetidine*, Famotidine, Ranitidin.
Gastric Proton pump inhibitors: Omeprazole, Lansoprazole, Rabeprazole,Pantoprazole
Anti-neoplastic agents: Alkylating agents: Meclorethamine*, Cyclophosphamide, Melphalan, Chlorambucil, Busulfan, Thiotepa **Antimetabolites:** Mercaptopurine*, Thioguanine, Fluorouracil, Floxuridine, Cytarabine, Methotrexate*, Azathioprine **Antibiotics:** Dactinomycin, Daunorubicin, Doxorubicin, Bleomycin **Plant products:** Etoposide, Vinblastin sulphate, Vincristin sulphate
Miscellaneous: Cisplatin, Mitotane.

UNIT- II **10 Hours**

Anti-anginal:
Vasodilators: Amyl nitrite, Nitroglycerin*, Pentaerythritol tetranitrate, Isosorbide dinitrite*, Dipyridamole.
Calcium channel blockers: Verapamil, Bepridil hydrochloride, Diltiazem hydrochloride, Nifedipine, Amlodipine, Felodipine, Nicardipine, Nimodipine.
Diuretics: Carbonic anhydrase inhibitors: Acetazolamide*, Methazolamide, Dichlorphenamide.
Thiazides: Chlorthiazide*, Hydrochlorothiazide, Hydroflumethiazide, Cyclothiazide,
Loop diuretics: Furosemide*, Bumetanide, Ethacrynic acid. Potassium sparing Diuretics: Spironolactone, Triamterene, Amiloride. Osmotic Diuretics: Mannitol
Anti-hypertensive Agents: Timolol, Captopril, Lisinopril, Enalapril, Benazepril hydrochloride, Quinapril hydrochloride, Methyldopate hydrochloride,* Clonidine hydrochloride, Guanethidine monosulphate, Guanabenz acetate, Sodium nitroprusside, Diazoxide,Minoxidil, Reserpine, Hydralazine hydrochloride.

UNIT-III **10 Hours**

Anti-arrhythmic Drugs: Quinidine sulphate, Procainamide hydrochloride, Disopyramide phosphate*, Phenytoin sodium, Lidocaine hydrochloride, Tocainide hydrochloride, Mexiletine hydrochloride, Lorcainide hydrochloride, Amiodarone, Sotalol.
Anti-hyperlipidemic agents: Clofibrate, Lovastatin, Cholesteramine and Cholestipol
Coagulant & Anticoagulants: Menadione, Acetomenadione, Warfarin*,Anisindione, clopidogrel
Drugs used in Congestive Heart Failure: Digoxin, Digitoxin, Nesiritide, Bosentan, Tezosentan.

UNIT- IV **08 Hours**

Drugs acting on Endocrine system

Nomenclature, Stereochemistry and metabolism of steroids **Sex hormones**: Testosterone, Nandralone, Progestrones, Oestriol, Oestradiol, Oestrione, Diethyl stilbestrol. **Drugs for erectile dysfunction:** Sildenafil, Tadalafil. **Oral contraceptives:** Mifepristone, Norgestril, Levonorgestrol **Corticosteroids:** Cortisone, Hydrocortisone, Prednisolone, Betamethasone, Dexamethasone

Thyroid and antithyroid drugs: L-Thyroxine, L-Thyronine, Propylthiouracil, Methimazole.

UNIT – V **07 Hours**

Antidiabetic agents:

Insulin and its preparations Sulfonyl ureas: Tolbutamide*, Chlorpropamide, Glipizide, Glimepiride.

Biguanides: Metformin. Thiazolidinediones: Pioglitazone, Rosiglitazone. Meglitinides: Repaglinide, Nateglinide. Glucosidase inhibitors: Acrabose, Voglibose.

Local Anesthetics: SAR of Local anesthetics

Benzoic Acid derivatives; Cocaine, Hexylcaine, Meprylcaine, Cyclomethycaine,Piperocaine.

Amino Benzoic acid derivatives: Benzocaine*, Butamben, Procaine*, Butacaine, Propoxycaine, Tetracaine, Benoxinate.

Lidocaine/Anilide derivatives: Lignocaine, Mepivacaine, Prilocaine, Etidocaine.

Miscellaneous: Phenacaine, Diperodon, Dibucaine.*

B. PHARM COURSE SCHEME- SEMESTER IV

Table-V: Course of study for semester V

Course code	Name of the course	No. of hours	Tutorial	Credit points
BP501T	Medicinal Chemistry II – Theory	3	1	4
BP502T	Industrial Pharmacyl– Theory	3	1	4
BP503T	Pharmacology II – Theory	3	1	4
BP504T	Pharmacognosy and Phytochemistry II– Theory	3	1	4
BP505T	Pharmaceutical Jurisprudence – Theory	3	1	4
BP506P	Industrial Pharmacyl – Practical	4	-	2
BP507P	Pharmacology II – Practical	4	-	2
BP508P	Pharmacognosy and Phytochemistry II – Practical	4	-	2
BP509CV	Comprehensive Viva-Voce [F] – V	-	-	-
	Total	27	5	26

[F] Non University Examination (NUE) with grading

COURSE PLAN

DELIVERY METHODS:
Power Point Presentation, Tutorials, Video Lectures, Design exercises, assignments, and Interactive session, viva voce.

COVERAGE:
Unit 1 by: - Power Point Presentation, Hand notes, Video Lectures, assignments.

Unit 2 by: - Power Point Presentation, Hand notes, Video Lectures, assignments, Interactive session.

Unit 3 by: - Power Point Presentation, Hand notes, Video Lectures, assignments,Design exercises, assignments.

Unit 4 by: - Power Point Presentation, Hand notes, Video Lectures, assignments, Interactive session.

Unit 5 by: -Power Point Presentation, Hand notes, Video Lectures, assignments, Interactive session

BEYOND SYLLABUS:

GPAT Exam Preparation

Group Discussion

LESSON PLAN

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BALAJI COLLEGE OF PHARMACY, ANANTHAPURAMU.			
Programme:	B-PHARMACY	Sem.:	V SEM (III-I)
Name of Course:(*Subject*)	MEDICINALCHEMISTRY -II(Theory)	CourseCode:	BP501T
Teaching facultyofthecourse	G.THIRUMALA ROOPESH		
Lecture Plan for Two Sessional	**Section- A & B**		

Sessional	Number of Hours of Theory Lecture	Number of Hours of other Pedagogy	Total Number of Lecture Hours
I	17	1	18
II	30	1	33
Total No. of Hours	47	2	49

Scheduled Date: **29/07/2024 to 23/11/2024**

Reference Books: (Latest Editions)

1. Wilson and Giswold's Organic medicinal and Pharmaceutical Chemistry.
2. Foye's Principles of Medicinal Chemistry.
3. Burger's Medicinal Chemistry, Vol I to IV.
4. Introduction to principles of drug design- Smith and Williams.
5. Remington's Pharmaceutical Sciences.
6. Martindale's extra pharmacopoeia
7. Organic Chemistry by I.L. Finar, Vol. II.
8. The Organic Chemistry of Drug Synthesis by Lednicer, Vol. 1-5.
9. Indian Pharmacopoeia.
10. Text book of practical organic chemistry- A.I.Vogel.

S.No	Chapter name	Topic	No. of hours	Name of the faculty
		MID-I 18 Lectures + 1 Activities		
1	Unit-I	**Antihistaminic agents:** Histamine, receptors and their distribution in the human body **H_1–antagonists:** Diphenhydramine hydrochloride*, Dimenhydrinate,Doxylamines cuccinate, Clemastine fumarate, Diphenylphyraline hydrochloride,Tripelenamine hydrochloride, Chlorcyclizine hydrochloride, Meclizinehydrochloride, Buclizine hydrochloride, Chlorpheniramine maleate, Triprolidine hydrochloride*, Phenidamine tartarate, Promethazine hydrochloride*,Trimeprazine tartrate, Cyproheptadine hydrochloride, Azatidine maleate,	6	Mr. G.T.Roopesh

		Astemizole, Loratadine, Cetirizine, Levocetrazine Cromolyn sodium .		
	Unit-I	**H_2-antagonists:** Cimetidine*, Famotidine, Ranitidin. **Gastric Proton pump inhibitors:** Omeprazole, Lansoprazole, Rabeprazole,Pantoprazole **Anti-neoplastic agents: Alkylating agents:** Meclorethamine*, Cyclophosphamide, Melphalan, Chlorambucil, Busulfan, Thiotepa **Antimetabolites:** Mercaptopurine*, Thioguanine, Fluorouracil, Floxuridine, Cytarabine, Methotrexate*, Azathioprine **Antibiotics:** Dactinomycin, Daunorubicin, Doxorubicin, Bleomycin **Plant products:** Etoposide, Vinblastin sulphate, Vincristin sulphate**Miscellaneous:** Cisplatin, Mitotane	**4**	**Mr. G.T.Roopesh**
2	**Unit-II**	**Anti-anginal**: **Vasodilators:** Amyl nitrite, Nitroglycerin*, Pentaerythritol tetranitrate, Isosorbide dinitrite*, Dipyridamole. **Calcium channel blockers:** Verapamil, Bepridil hydrochloride, Diltiazem hydrochloride, Nifedipine, Amlodipine, Felodipine, Nicardipine, Nimodipine.	**7**	**Mr. G.T.Roopesh**
		ASSIGNMENT-I		
		MID-II **31 Lectures + 1 Activities**		
	Unit-II	**Diuretics:** Carbonic anhydrase inhibitors: Acetazolamide*, Methazolamide, Dichlorphenamide. Thiazides: Chlorthiazide*, Hydrochlorothiazide, Hydroflumethiazide, Cyclothiazide, Loop diuretics: Furosemide*, Bumetanide, Ethacrynic acid. Potassium sparing Diuretics: Spironolactone, Triamterene, Amiloride. Osmotic Diuretics: Mannitol	**2**	
		Anti-hypertensive Agents: Timolol, Captopril, Lisinopril, Enalapril, Benazepril hydrochloride, Quinapril hydrochloride, Methyldopate hydrochloride,* Clonidine hydrochloride, Guanethidine monosulphate, Guanabenz acetate, Sodium nitroprusside, Diazoxide,Minoxidil, Reserpine, Hydralazine hydrochloride.	**2**	
3	**Unit-III**	**Anti-arrhythmic Drugs**: Quinidine sulphate, Procainamide hydrochloride, Disopyramide phosphate*, Phenytoin sodium, Lidocaine hydrochloride, Tocainide hydrochloride, Mexiletine hydrochloride, Lorcainide hydrochloride, Amiodarone, Sotalol.	**2**	**Mr. G.T.Roopesh**

	Unit-III	**Anti-hyperlipidemic agents**: Clofibrate, Lovastatin, Cholesteramine and Cholestipol	**6**	
	Unit-III	**Coagulant & Anticoagulants**: Menadione, Acetomenadione, Warfarin*,Anisindione, clopidogrel **Drugs used in Congestive Heart Failure:** Digoxin, Digitoxin, Nesiritide, Bosentan, Tezosentan.	**3**	
4	**Unit-IV**	**Drugs acting on Endocrine system** Nomenclature, Stereochemistry and metabolism of steroids **Sex hormones**: Testosterone, Nandralone, Progestrones, Oestriol, Oestradiol, Oestrione, Diethyl stilbestrol.	**3**	**Mr. G.T.Roopesh**
		Drugs for erectile dysfunction: Sildenafil, Tadalafil. **Oral contraceptives:** Mifepristone, Norgestril, Levonorgestrol	**3**	
		Corticosteroids: Cortisone, Hydrocortisone, Prednisolone, Betamethasone, Dexamethasone **Thyroid and antithyroid drugs**: L-Thyroxine, L-Thyronine, Propylthiouracil, Methimazole	**3**	
5	**Unit-V**	**Antidiabetic agents:** Insulin and its preparations Sulfonyl ureas: Tolbutamide*, Chlorpropamide, Glipizide, Glimepiride. Biguanides: Metformin. Thiazolidinediones: Pioglitazone, Rosiglitazone. Meglitinides: Repaglinide, Nateglinide. Glucosidase inhibitors: Acrabose, Voglibose.	**3**	**Mr. G.T.Roopesh**
		Local Anesthetics: SAR of Local anesthetics **Benzoic Acid derivatives**; Cocaine, Hexylcaine, Meprylcaine, Cyclomethycaine,Piperocaine. **Amino Benzoic acid derivatives**: Benzocaine*, Butamben, Procaine*, Butacaine, Propoxycaine, Tetracaine, Benoxinate.	**3**	
		Lidocaine/Anilide derivatives: Lignocaine, Mepivacaine, Prilocaine, Etidocaine. **Miscellaneous**: Phenacaine, Diperodon, Dibucaine.*	**2**	
		ASSIGNMENT-II		

Sessional Question Paper(MID EXAMINATION)

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Name of the Subject & Code: MEDICINAL CHEMISTRY-II & BP501T **Time: 1:30Hrs** **Marks:30M**

S.NO	I Answer the following questions 5 x 2=10 Marks	M	CO-A	BTL
1.	Define histamine and give examples for Anti-histamine drugs?	02	01	Remembering
2.	Define Anti-hypertensive drugs?	02	01	Remembering
3.	Write uses of Cimetidine?	02	02	Remembering
4.	Write MOA of Nitrates?	02	03	Remembering
5.	Define and classify types of Angina pectoris?	02	01	Understanding & Remembering
II. Answer any one question	**LONG ANSWER TYPE**	**1x10=10Marks**		
6.	Write briefly about synthesis,classification,MOA & uses of anti-neoplastic drugs?	10	04	Remembering
7.	Explain H1 & H2 antagonists drugs and write their MOA & uses of drugs?	10	05	Remembering
III. Answer any two questions	**SHORT ANSWER TYPE**	**2x5=10Marks**		
8.	Write a note on SAR of Anti-histaminic agents?	05	03	Remembering
9.	Classify Anti-hypertensive drugs and write synthesis of methyldopate hydrochloride.	05	02	Understanding
10.	Classify diuretic drugs with examples.	05	03	Creating

Balaji College of Pharmacy, Ananthapuramu.B-Pharmacy III Year -I Sem (V SEM) R19 -II Mid ExaminationNOV-2024 AY: 2024-25

Name of the Subject & Code: MEDICINAL CHEMISTRY-II & BP501T **Time: 1:30Hrs** **Marks:30M**

S.NO	I Answer the following questions 5 x 2=10 Marks	M	CO-A	BTL
1.	Define Anti-arrhythmic Drugs with examples.	02	CBP501T.1	Remembering
2.	Write about anti-hyperlipidemic agents with examples.	02	CBP501T.3	Understanding & Remembering
3.	Write metabolism of steroids.	02	CBP501T.3	Remembering
4.	Write different preparations of insulin.	02	CBP501T.3	Remembering
5.	Define Local Anesthetics with examples.	02	CBP501T.1	Remembering
II. Answer any one question	**LONG ANSWER TYPE**			**1x10=10Marks**
6.	Explain Coagulants & Anticoagulant,write synthesis,SAR of Warfarin.	10	CBP501T.3	Knowledge & Remembering
7.	Write Briefly about Classification of Local Anesthetics, Write synthesis of Benzocaine.	10	CBP501T.4	Remembering
III. Answer any two questions	**SHORT ANSWER TYPE**			**2x5=10Marks**
8.	Write a note on antidiabetic drugs with examples.	05	CBP501T.3	Remembering
9.	Write a note on Thyroid and antithyroid drugs.	05	CBP501T.3	Understanding
10.	Write Nomenclature and Stereochemistry of steroids.	05	CBP501T.4	Creating

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BALAJI COLLEGE OF PHARMACY :: ANANTAPUR

B.PHARMACY – III-YEAR-I-SEM (V SEM)-2024-2025 (R19)

REG THEORY MID EXAMINATIONS AVERAGE MARKS AWARD LIST

Name of the Sub: MC-II Sub. Code: BP501T (Theory) Lab code:NA

Sl No.	H.T.No	Name Of The Student	MID-I		MID-II		Avg (15M)	Continuous Mode (10 M)	Total (25M)
			FOR 30 M	FOR 15 M	FOR 30 M	FOR 15 M			
1.	22T11R0001	Abhi Ravi Gari	16	8	15	7.5	8	8	16
2.	22T11R0002	Aditya Dasa	23	11.5	24	12	12	9	21
3.	22T11R0003	Afreen Taj K S	27	13.5	27	13.5	14	9	23
4.	22T11R0004	Ajay Kumar Chakali					6	7	13
5.	22T11R0005	Aliya Tabassum L S	24	12	29	14.5	14	9	23
6.	22T11R0006	Anitha Kunchapu	27	13.5	28	14	14	10	24
7.	22T11R0007	Anitha Narappala	25	12.5	27	13.5	13	10	23
8.	22T11R0008	Anjulatha Kondagogula					7	8	15
9.	22T11R0009	Anuradha P H	19	9.5	28	14	12	9	21
10.	22T11R0010	Arjun Uppara	21	10.5	23	11.5	11	9	20
11.	22T11R0011	Arshiya Banu C	26	13	28	14	14	10	24
12.	22T11R0012	Atiya Khanam Mohammad	28	14	28	14	13	10	23
13.	22T11R0013	Avinash Sajjanagandla	19	95	25	12.5	11	9	20
14.	22T11R0014	Bhavana Kodathala	21	10.5	24	12	12	9	21
15.	22T11R0015	Bhavya Spandana Pulla	19	10	29	14.5	12	10	22
16.	22T11R0016	Bhavya Sree C	29	14	28	14	14	10	24

17.	22T11R0017	Bheemeswari Kondapuram	26	13	28	14	14	9	23
18.	22T11R0018	Bhumika Chakali	24	12	27	13.5	13	9	22
19.	22T11R0019	Chandana Bandeeppagari	26	13	30	15	14	9	23
20.	22T11R0020	Deepika Varikuti	29	14.5	28	14	14	10	24
21.	22T11R0021	Dhanusha Prodduturu	28	14	29	14.5	14	10	24
22.	22T11R0022	Dinesh Kumar Manchala	25	12.5	28	14	14	8	22
23.	22T11R0023	Divya Bayamutaka	22	11	27	13.5	13	9	22
24.	22T11R0024	Divya Sree Charugundla	23	11.5	27	13.5	13	10	23
25.	22T11R0025	Faseeha Shaik	27	13.5	28	14	14	10	24
26.	22T11R0026	Gnapika Pendem	28	14	29	14.5	14	10	24
27.	22T11R0027	Gowri Muguda	22	11	24	12	12	10	22
28.	22T11R0028	Harathi Valipi	27	13.5	29	14.5	14	9	23
29.	22T11R0029	Hemanth Kumar Indla	13	6.5	9	4.5	6	7	13
30.	22T11R0030	Jagan Mohan Naik Bhukya	26	13	26	13	13	8	21
31.	22T11R0031	Jahnavi Bestha					6	8	14
32.	22T11R0032	Jaswanth Reddy Reddyvari					6	7	13
33.	22T11R0033	Jayalakshmi Shivanna Gari	27	13.5	26	13	14	10	24
34.	22T11R0034	Jyothsna Moola	28	14	29	41.5	15	9	24
35.	22T11R0035	Kalpana Puttha	26	13	25	12.5	13	9	22
36.	22T11R0036	Kranthi Yeggidi	26	13	26	13	13	10	23
37.	22T11R0037	Krishna Veni G	22	11	28	14	14	9	22
38.	22T11R0038	Kulsum Patan	28	14	AB	AB	7	9	16
39.	22T11R0039	Lakshmi Korrapati	27	13.5	27	13.5	14	9	23

40.	22T11R0040	Lakshmipriya Belle	28	14	27	13.5	14	10	24
41.	22T11R0041	Lalitha Digivindla Chakala	25	12.5	29	14.5	14	9	23
42.	22T11R0042	Likhitha Alugunti	27	13.5	28	14	14	9	23
43.	22T11R0044	Mahammad Shakeer Gosaripalli	23	11.5	28	14	13	9	22
44.	22T11R0045	Mahesh Khamithkar	28	14	28	14	14	10	24
45.	22T11R0046	Manoj Kumar Avvari	21	10.5	20	10	11	8	19
46.	22T11R0047	Meghamala Ventrukulappa Gari	27	13.5	28	14	14	9	23
47.	22T11R0048	Meghana Jangam	26	13	17	8.5	11	9	20
48.	22T11R0049	Mohammed Kaif N	17	8.5	18	9	9	7	16
49.	22T11R0050	Mounika Chinna Gowni	27	13.5	27	13.5	14	9	23
50.	22T11R0051	Mounika Goddumuri	27	13.5	27	13.5	14	9	23
51.	22T11R0052	Muskan Silar	27	13.5	29	14.5	14	10	24
52.	22T11R0053	Nagarjuna Thummasi	22	11	25	12.5	12	8	20
53.	22T11R0054	Nageswari Bayappagari	21	11.5	24	12	12	9	21
54.	22T11R0055	Nandini Ediga	28	14	29	14.5	14	10	24
55.	22T11R0056	Nandini Sake	9	4.5	AB	AB	3	9	12
56.	22T11R0057	Navaneetha Sunkara	29	14.5	28	14	14	10	24
57.	22T11R0058	Navanitha Ponthati	29	14.5	29	14.5	14	10	24
58.	22T11R0059	Naveen Raju Chakali	21	10.5	20	10	11	8	19
59.	22T11R0060	Navya Muktham	26	13	26	13	13	9	22
60.	22T11R0061	Navya Nandini Matam	18	9	24	12	12	9	21
61.	22T11R0062	Nikhila Thalari	8	4	17	8.5	7	9	16
62.	22T11R0063	Pallavi Beldon	27	13.5	29	14.5	14	10	24

63.	22T11R0064	Pallavi Jasthi	15	7.5	22	11	10	10	20
64.	22T11R0065	Pallavi Nagadani	29	14.5	28	14	14	10	24
65.	22T11R0066	Peddi Reddy Guda	15	7.5	18	9	9	10	19
66.	22T11R0067	Prasanthi Kathe	23	11.5	24	12	12	9	21
67.	22T11R0068	Pravallika Neeruganti	27	13.5	29	14.5	14	9	23
68.	22T11R0069	Priyanka I	11	5.5	18	9	8	9	17
69.	22T11R0070	Reena Vade Muthana	26	13	25	12.5	13	9	22
70.	22T11R0071	Rozina Tabassum Dilkush	4	2	13	6.5	5	9	14
71.	22T11R0072	Rukmini Paruchuri	20	10	25	12.5	12	10	22
72.	22T11R0073	Rupaamrutha Rallacheni	26	13	26	13	13	9	22
73.	22T11R0074	Sabiha Thaslim Haji Achula					6	8	14
74.	22T11R0075	Sadikha Shaik	24	12	26	13	13	10	23
75.	22T11R0076	Sahitha Neeruganti	25	12.5	18	9	11	9	20
76.	22T11R0077	Sai Mounika Chinthamanu	25	12.5	27	13.5	13	9	22
77.	22T11R0078	Sai Mukthi Malyavantham	27	13.5	28	14	14	10	24
78.	22T11R0079	Samanthakamani Velpula	20	10	21	10.5	11	10	21
79.	22T11R0080	Samarasimha Valmiki	24	12	23	11.5	12	9	21
80.	22T11R0081	Sangeetha Dasari	21	12	29	14.5	14	10	24
81.	22T11R0082	Saniya Ruhi Shaik	21	10.5	28	14	13	9	22
82.	22T11R0083	Shahin Begum T M	23	11.5	27	13.5	13	9	22
83.	22T11R0084	Shahira Alisher	23	11.5	17	8.5	10	8	18
84.	22T11R0085	Shamiulla Shaik	24	12	22	11	12	9	21
85.	22T11R0086	Shilpa K A	18	9	24	12	11	9	20

86.	22T11R0087	Shirisha Billa	27	13.5	28	14	14	9	23
87.	22T11R0088	Shiva Sai Boggula	25	12.5	26	13	13	8	21
88.	22T11R0089	Siddesh Yanjarappa Gari	23	11.5	23	11.5	12	8	20
89.	22T11R0090	Simhadri Nallolla	12	6	20	10	8	7	15
90.	22T11R0091	Sireesha Kamsala	19	9.5	18	9	10	9	19
91.	22T11R0092	Snehalatha Talari	21	10.5	24	12	12	9	21
92.	22T11R0093	Soundarya Rajappagari	23	11.5	26	13	13	10	23
93.	22T11R0094	Sravani Siriyapu Reddy	22	11	25	12.5	12	9	21
94.	22T11R0095	Sri Lakshmi Kurupati	28	14	29	14.5	14	10	24
95.	22T11R0096	Suchitra Sagabala					8	9	17
96.	22T11R0097	Sumalatha Yerasi	23	11.5	24	12	12	9	21
97.	22T11R0098	Suneetha Kappala	22	11	25	12.5	12	10	22
98.	22T11R0099	Swetha Neelam	22	11	28	14	13	9	22
99.	22T11R00A1	Tanuja Busetty	16	8	23	11.5	10	9	19
100.	22T11R00A2	Tejasri Challa	23	11.5	30	15	14	10	24
101.	22T11R00A3	Tejaswini T	20	10	22	11	11	10	21
102.	22T11R00A4	Uma Maheswara S Manikanta S	13	6.5	17	8.5	8	8	16
103.	22T11R00A5	Vasanthi Bandi	20	10	24	12	11	10	21
104.	22T11R00A6	Vasundara Vadde	13	6.5	23	11.5	9	9	18
105.	22T11R00A7	Venkat Nikheyth Reddi C	13	6.5	19	9.5	8	7	15
106.	22T11R00A8	Vishala Jenne	26	13	27	13.5	14	9	23
107.	22T11R00A9	Vishnuvardhan Reddy Lingala	25	12.5	26	13	13	8	21
108.	22T11R00B0	Yogananda N	16	8	22	11	10	9	19

109.	23T15R0001	A ANJALI	25	12.5	26	13	13	10	23
110.	21KM1R0015	T MANI KUMAR	AB	AB	6	3	2	10	12
111.	219N1R0071	T.HARITHA	28	14	30	15	15	9	24

COURSE OUTCOMES

Academic Year: 2024 – 2025 Class: III YEAR I SEM SEM: V

Program: B. Pharmacy

Name of the Course: **MC-II**

Prescribed Hours: **Theory**: 3 + 1 Hrs./Week

Scheduled Date: 29/07/2024 to 23/11/2024

CO NO.	Course Outcome
C3.5.1.1	Understand the chemistry of drugs with respect to their pharmacological activity
C3.5.1.2	Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
C3.5.1.3	Know the Structural Activity Relationship of different class of drugs
C3.5.1.4	Study the chemical synthesis of selected drugs.
C3.5.1.5	Study the chemical synthesis of selected drugs and Structural Activity Relationship of different class of drugs.

CO-PO MAPPING

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BALAJI COLLEGE OF PHARMACY

Approved by PCI, New Delhi & Affiliated to JNTUA Ananthapuramu.

Rudrampeta Bypass, Sanapa Road, Ananthapuramu, Andhra Pradesh -515002

Academic Year: 2024 – 2025 Class: III YEAR I SEM SEM: V

Program: B. Pharmacy

Name of the Course: **MC-II**

Prescribed Hours: **Theory**: 3 + 1 Hrs./Week

Scheduled Date: 29/07/2024 to 23/11/2024

ASSIGNMENTS

ASSIGNMENT TOPIC	Course Outcome	BTL
Assignment 1		
Classify with synthesis Drugs acting on CVS	C5.1.1 C5.1.2 C5.4.4	Understanding Applying
Classify Antineoplastics with synthesis	C5.1.1 C5.1.2	Understanding Applying
Assignment 2		
Classification of **Antidiabetic agents:** Insulin and its preparations Sulfonyl ureas: Tolbutamide*	C5.1.3 C5.1.4 C5.1.5	Remembering Understanding
Thyroid and antithyroid drugs: L-Thyroxine, L-Thyronine, Propylthiouracil, Methimazole.	C5.1.1	Analyzing

Format of the assignment:

1. Minimum & Maximum number of pages.
2. It shall be written draft copy.
3. Name and signature of the student.
4. Assignment can be a combined seminar presentation at the end of the semester.
5. Time allocated for seminar may be 8+2 Min.

UNIT WISE IMPORTANT QUESTIONS

BALAJI COLLEGE OF PHARMACY

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Rudrampeta Bypass, Sanapa Road, Ananthapuramu, Andhra Pradesh -515002

Academic Year: 2024 – 2025 Class: III YEAR I SEM SEM: V

Program: B. Pharmacy

Name of the Course: **MEDICINAL CHEMISTRY-II**

Prescribed Hours: **Theory**: 3 + 1 Hrs./Week

Scheduled Date: 29/07/2024 to 23/11/2024

QUESTION BANK

BP501T. MEDICINAL CHEMISTRY-I (Theory) 45 Hours

UNIT I **10 Hours**

Antihistaminic agents: Histamine, receptors and their distribution in the human body
H_1–antagonists: Diphenhydramine hydrochloride*, Dimenhydrinate,Doxylamines cuccinate, Clemastine fumarate, Diphenylphyraline hydrochloride,Tripelenamine hydrochloride, Chlorcyclizine hydrochloride, Meclizinehydrochloride, Buclizine hydrochloride, Chlorpheniramine maleate, Triprolidine hydrochloride*, Phenidamine tartarate, Promethazine hydrochloride*,Trimeprazine tartrate, Cyproheptadine hydrochloride, Azatidine maleate, Astemizole, Loratadine, Cetirizine, Levocetrazine Cromolyn sodium
H_2-antagonists: Cimetidine*, Famotidine, Ranitidin.
Gastric Proton pump inhibitors: Omeprazole, Lansoprazole, Rabeprazole,Pantoprazole
Anti-neoplastic agents: Alkylating agents: Meclorethamine*, Cyclophosphamide, Melphalan, Chlorambucil, Busulfan, Thiotepa **Antimetabolites:** Mercaptopurine*, Thioguanine, Fluorouracil, Floxuridine, Cytarabine, Methotrexate*, Azathioprine **Antibiotics:** Dactinomycin, Daunorubicin, Doxorubicin, Bleomycin **Plant products:** Etoposide, Vinblastin sulphate, Vincristin sulphate
Miscellaneous: Cisplatin, Mitotane.

Histamine and Receptors

1. What is histamine, and what role does it play in the human body?
2. Describe the function of histamine receptors (H1, H2, H3, H4).
3. Where are H1 histamine receptors predominantly located in the human body?
4. What physiological processes are influenced by H1 receptors?
5. Where are H2 histamine receptors predominantly found, and what is their function?
6. Explain the role of H3 and H4 receptors in the immune system.
7. How does histamine contribute to allergic reactions in the body?
8. What is the significance of histamine release in gastric acid secretion?
9. Discuss the importance of histamine in neurotransmission within the brain.

H1-Antagonists

1. What is the mechanism of action of H1-antagonists?
2. How do first-generation H1-antagonists (like Diphenhydramine and Dimenhydrinate) differ from second-generation antihistamines?
3. What are some common uses for H1-antagonists like Diphenhydramine and Dimenhydrinate?
4. What are the potential side effects of first-generation antihistamines such as Diphenhydramine and Promethazine?

5. What is the role of second-generation H1-antagonists (e.g., Loratadine, Cetirizine) in treating allergic rhinitis?
6. How does the sedative effect of some antihistamines (like Doxylamine) contribute to their use in sleep aids?
7. Explain the difference between H1-antagonists like Chlorpheniramine and newer agents like Levocetirizine.
8. Why might Cyproheptadine be used for conditions such as anorexia or serotonin syndrome?
9. How does the use of Promethazine as an antiemetic relate to its antihistamine properties?
10. What is the clinical importance of Cromolyn sodium in relation to histamine?

H2-Antagonists

1. What is the mechanism of action of H2-antagonists like Cimetidine and Famotidine?
2. How do H2-antagonists help manage conditions like gastroesophageal reflux disease (GERD) or peptic ulcers?
3. What are the major side effects associated with H2-antagonists such as Cimetidine and Ranitidine?
4. What differentiates H2-antagonists from proton pump inhibitors (PPIs) in terms of their effect on gastric acid secretion?
5. Why is Ranitidine's use limited in some cases following concerns about impurities?

Proton Pump Inhibitors (PPIs)

1. How do proton pump inhibitors (e.g., Omeprazole, Lansoprazole) reduce gastric acid production?
2. What are some clinical conditions that are treated with PPIs?
3. What are the potential risks or side effects associated with long-term use of PPIs?
4. How does Pantoprazole compare to Omeprazole in terms of efficacy and side effects?
5. Explain how Rabeprazole works to alleviate symptoms of gastroesophageal reflux disease (GERD).

Anti-Neoplastic Agents

Alkylating Agents

1. What is the mechanism of action of alkylating agents like Cyclophosphamide and Meclorethamine in cancer treatment?
2. How do alkylating agents induce cell death in rapidly dividing cancer cells?
3. What are the common side effects associated with alkylating agents like Cyclophosphamide?
4. Why is the use of alkylating agents like Chlorambucil crucial in hematological malignancies?
5. How does Busulfan work as part of chemotherapy regimens?

Antimetabolites

1. What is the role of antimetabolites like Methotrexate in the treatment of cancer?
2. How does Mercaptopurine work as an antimetabolite in the treatment of leukemia?
3. Why is Folate supplementation important when using Methotrexate for chemotherapy?
4. How does Cytarabine function as an antimetabolite in the treatment of acute myeloid leukemia (AML)?
5. What are the side effects of antimetabolites like Fluorouracil and Azathioprine?

Antibiotics (Cancer Treatment)

1. What are the mechanisms of action of antibiotics like Doxorubicin and Daunorubicin in cancer therapy?
2. How do agents like Bleomycin induce DNA damage to inhibit cancer cell growth?
3. What are some of the specific side effects associated with Doxorubicin, such as cardiotoxicity?
4. What are the unique properties of Dactinomycin in treating childhood cancers like Wilms' tumor?

Plant Products

1. How do plant products like Vincristine and Vinblastine work in the treatment of cancer?
2. What are the potential side effects of using Vincristine in chemotherapy?
3. Explain the role of Etoposide in combination chemotherapy regimens.

Miscellaneous Agents

1. What is the role of Cisplatin in treating solid tumors, and what are its associated toxicities?
2. How does Mitotane function in the treatment of adrenal cancer, and what are its side effects?

UNIT- II 10 Hours

Anti-anginal:
Vasodilators: Amyl nitrite, Nitroglycerin*, Pentaerythritol tetranitrate, Isosorbide dinitrite*, Dipyridamole.
Calcium channel blockers: Verapamil, Bepridil hydrochloride, Diltiazem hydrochloride, Nifedipine, Amlodipine, Felodipine, Nicardipine, Nimodipine.
Diuretics: Carbonic anhydrase inhibitors: Acetazolamide*, Methazolamide, Dichlorphenamide.
Thiazides: Chlorthiazide*, Hydrochlorothiazide, Hydroflumethiazide, Cyclothiazide,
Loop diuretics: Furosemide*, Bumetanide, Ethacrynic acid. Potassium sparing Diuretics: Spironolactone, Triamterene, Amiloride. Osmotic Diuretics: Mannitol
Anti-hypertensive Agents: Timolol, Captopril, Lisinopril, Enalapril, Benazepril hydrochloride, Quinapril hydrochloride, Methyldopate hydrochloride,* Clonidine hydrochloride, Guanethidine monosulphate, Guanabenz acetate, Sodium nitroprusside, Diazoxide,Minoxidil, Reserpine, Hydralazine hydrochloride.

Anti-Anginal Agents:

Vasodilators

1. What is the mechanism of action of vasodilators like Nitroglycerin in the treatment of angina?
2. How do nitrates like Amyl Nitrite and Nitroglycerin help alleviate chest pain in angina patients?
3. What is the difference between short-acting nitrates (e.g., Nitroglycerin) and long-acting nitrates (e.g., Isosorbide Dinitrate)?
4. What are some potential side effects of using Nitroglycerin in angina treatment?
5. How does Pentaerythritol tetranitrate compare to Nitroglycerin in terms of efficacy and duration of action?
6. What is the role of Dipyridamole in the treatment of angina, and how does it work?

Calcium Channel Blockers

1. How do calcium channel blockers like Verapamil and Diltiazem help to reduce angina symptoms?
2. Explain the difference in action between the non-dihydropyridine calcium channel blockers (e.g., Verapamil, Diltiazem) and the dihydropyridine calcium channel blockers (e.g., Nifedipine, Amlodipine).
3. What are the potential side effects of calcium channel blockers in the treatment of angina?
4. How does Amlodipine differ from Nifedipine in terms of potency and side effects for treating angina?
5. Why is Nimodipine specifically used in the prevention of cerebral vasospasm, and how does this relate to its action as a calcium channel blocker?
6. What role does Bepridil hydrochloride play in angina treatment, and why is it considered less commonly used?

Diuretics:

Carbonic Anhydrase Inhibitors

1. What is the mechanism of action of carbonic anhydrase inhibitors like Acetazolamide, and in what conditions are they most effective?
2. How does Acetazolamide work to reduce intraocular pressure in conditions like glaucoma?
3. What are the main clinical uses of Methazolamide and Dichlorphenamide in diuretic therapy?
4. What are the potential side effects of using carbonic anhydrase inhibitors, such as Acetazolamide?

Thiazide Diuretics

1. How do thiazide diuretics like Hydrochlorothiazide and Chlorthiazide work to reduce blood pressure in hypertensive patients?
2. What are the key differences between Hydrochlorothiazide and Hydroflumethiazide in terms of their pharmacologic properties?
3. What are the common side effects of thiazide diuretics, and how can they be managed?
4. How do thiazide diuretics reduce edema in patients with heart failure or renal disease?
5. Why are thiazides commonly used as first-line therapy for hypertension?

Loop Diuretics

1. What is the mechanism of action of loop diuretics like Furosemide in the treatment of heart failure?
2. How do loop diuretics like Bumetanide and Furosemide compare to thiazide diuretics in terms of potency and side effects?
3. What are the risks associated with the use of loop diuretics, particularly in terms of electrolyte imbalances?
4. Why is Ethacrynic acid considered a second-line loop diuretic, and in what clinical scenarios might it be preferred over Furosemide?

Potassium-Sparing Diuretics

1. How do potassium-sparing diuretics like Spironolactone help to prevent potassium loss in patients receiving other diuretics?
2. What is the role of Spironolactone in the treatment of heart failure and ascites?
3. How does Amiloride differ from Triamterene in terms of their mechanisms of action as potassium-sparing diuretics?
4. What are the potential side effects of potassium-sparing diuretics, and how can hyperkalemia be prevented?

Osmotic Diuretics

1. What is the primary use of osmotic diuretics like Mannitol in clinical practice?
2. How does Mannitol reduce intracranial pressure, and in what conditions is it most commonly used?
3. What are the side effects and contraindications associated with the use of Mannitol?

Anti-Hypertensive Agents:

Beta-Blockers

1. How does Timolol work to manage hypertension, and what are its potential side effects?
2. What makes non-selective beta-blockers like Timolol different from selective beta-1 blockers, such as Metoprolol?
3. Why are beta-blockers like Timolol often used in the treatment of glaucoma?

ACE Inhibitors

1. What is the mechanism of action of ACE inhibitors like Captopril, Lisinopril, and Enalapril in the treatment of hypertension?
2. How does the inhibition of ACE contribute to the reduction of blood pressure in hypertensive patients?
3. What are some common side effects of ACE inhibitors like Captopril, and why is a dry cough a significant concern?
4. How do ACE inhibitors like Benazepril and Quinapril compare in terms of potency and duration of action?

Alpha-2 Agonists

1. How do alpha-2 agonists like Clonidine work to lower blood pressure?
2. What are the potential side effects of Clonidine, and why can sudden withdrawal of this medication cause rebound hypertension?
3. What role does Methyldopate hydrochloride play in the management of hypertension in pregnancy?

Sympatholytic Agents

1. How do sympatholytic agents like Guanethidine and Reserpine work to reduce blood pressure in hypertensive patients?
2. What are the potential side effects of Guanethidine and Reserpine, particularly regarding their effects on the central nervous system?

Vasodilators

1. What is the role of vasodilators like Sodium Nitroprusside and Diazoxide in the emergency management of hypertensive crises?
2. How does Hydralazine lower blood pressure, and what are the common side effects associated with its use?
3. Why is Minoxidil used in severe hypertension, and what are the risks associated with its long-term use?

UNIT-III 10 Hours

Anti-arrhythmic Drugs: Quinidine sulphate, Procainamide hydrochloride, Disopyramide phosphate*, Phenytoin sodium, Lidocaine hydrochloride, Tocainide hydrochloride, Mexiletine hydrochloride, Lorcainide hydrochloride, Amiodarone, Sotalol.
Anti-hyperlipidemic agents: Clofibrate, Lovastatin, Cholesteramine and Cholestipol
Coagulant & Anticoagulants: Menadione, Acetomenadione, Warfarin*,Anisindione, clopidogrel
Drugs used in Congestive Heart Failure: Digoxin, Digitoxin, Nesiritide, Bosentan, Tezosentan.

Anti-Arrhythmic Drugs:

1. What is the mechanism of action of Quinidine sulphate in the management of arrhythmias?
2. How does Procainamide hydrochloride compare to Quinidine in terms of efficacy and side effects for treating ventricular arrhythmias?
3. What are the key differences in the mechanism of action between Class I anti-arrhythmic drugs (like Quinidine and Disopyramide) and Class III drugs (like Amiodarone)?
4. How does Phenytoin sodium function as an anti-arrhythmic, particularly in the treatment of ventricular arrhythmias?

5. What is the role of Lidocaine hydrochloride in the emergency management of acute ventricular arrhythmias?
6. How does Mexiletine differ from Lidocaine in terms of pharmacokinetics and clinical use?
7. What are the potential side effects and toxicities associated with the use of Class I anti-arrhythmic drugs like Disopyramide?
8. How do the pharmacodynamics and clinical uses of Lorcainide differ from those of other Class IC anti-arrhythmic drugs?
9. What is the role of Amiodarone in treating atrial and ventricular arrhythmias, and what are the major long-term side effects associated with its use?
10. What are the differences in the mechanism of action of Sotalol compared to other anti-arrhythmic agents like Amiodarone?
11. How does Sotalol combine both beta-blocker and anti-arrhythmic properties? What is its role in managing atrial fibrillation?
12. What are the key considerations when using anti-arrhythmic drugs in patients with underlying structural heart disease?

Anti-Hyperlipidemic Agents:

1. How does Clofibrate help in lowering cholesterol levels, and what are its side effects?
2. What is the mechanism of action of Lovastatin in reducing cholesterol, and how does it differ from other statins?
3. How do statins like Lovastatin reduce the risk of cardiovascular disease, and what are the common side effects associated with their use?
4. What is the role of Cholestyramine and Cholestipol in lowering cholesterol, and how do they differ from statins in terms of mechanism?
5. How do bile acid sequestrants like Cholestyramine and Cholestipol reduce LDL cholesterol levels, and what are the potential gastrointestinal side effects?
6. Why might a physician choose to combine a statin with a bile acid sequestrant (e.g., Cholestyramine) in managing hyperlipidemia?
7. What are the potential drug interactions associated with the use of Lovastatin and other statins?

Coagulants & Anticoagulants:

Coagulants:

1. What is the role of Menadione and Acetomenadione in treating vitamin K deficiency?
2. How do Menadione and Acetomenadione help in reversing the effects of anticoagulants like Warfarin?

Anticoagulants:

1. What is the mechanism of action of Warfarin in inhibiting blood clot formation, and how is its dose managed?
2. What are the common side effects of Warfarin, and why is monitoring INR levels important during therapy?
3. How does Anisindione differ from Warfarin in terms of pharmacodynamics and clinical use?
4. What is the mechanism of action of Clopidogrel, and how does it compare to other antiplatelet drugs like aspirin?
5. What are the potential complications associated with the use of anticoagulants like Warfarin and Clopidogrel, and how are they managed?
6. How does Clopidogrel interact with other medications and what are the clinical considerations when prescribing it?
7. What factors influence the effectiveness of Warfarin therapy, and how does genetic variation play a role in dosing?

Drugs Used in Congestive Heart Failure (CHF):

1. How does Digoxin help manage heart failure symptoms, and what is its mechanism of action?
2. What are the key differences between Digoxin and Digitoxin in terms of pharmacokinetics and clinical use in heart failure?
3. What are the common side effects and potential toxicity concerns associated with Digoxin therapy?
4. How does Nesiritide work as a treatment for heart failure, and in what clinical situations is it used?
5. What is the role of Bosentan and Tezosentan in treating heart failure, particularly in patients with pulmonary hypertension?
6. What are the mechanisms of action of Bosentan and Tezosentan in reducing pulmonary vascular resistance?
7. What are the side effects and clinical monitoring requirements when using Bosentan for congestive heart failure?
8. How does the use of Nesiritide compare to other treatments like vasodilators in managing acute decompensated heart failure?
9. What are the considerations for using Digoxin in elderly patients with heart failure?
10. What are the potential interactions between Digoxin and other drugs used to treat heart failure?

UNIT- IV 08 Hours

Drugs acting on Endocrine system

Nomenclature, Stereochemistry and metabolism of steroids Sex hormones: Testosterone, Nandralone, Progestrones, Oestriol, Oestradiol, Oestrione, Diethyl stilbestrol. Drugs for erectile dysfunction: Sildenafil, Tadalafil. Oral contraceptives: Mifepristone, Norgestril, Levonorgestrol Corticosteroids: Cortisone, Hydrocortisone, Prednisolone, Betamethasone, Dexamethasone

Thyroid and antithyroid drugs: L-Thyroxine, L-Thyronine, Propylthiouracil, Methimazole.

Nomenclature, Stereochemistry, and Metabolism of Steroids:

1. What is the basic structure of steroids, and how does their stereochemistry influence their biological activity?
2. How does the metabolism of steroids like testosterone and corticosteroids affect their duration of action and efficacy?
3. What are the key enzymes involved in the metabolism of steroids, and how do they differ for sex hormones and corticosteroids?
4. What role does liver metabolism play in the breakdown of sex hormones like testosterone and oestradiol?
5. How does the addition or removal of functional groups (such as hydroxyl or ketone groups) influence the potency and pharmacodynamics of steroid drugs?

Sex Hormones:

1. What is the mechanism of action of testosterone in the male body, and how does it affect secondary sexual characteristics?
2. How does nandrolone differ from testosterone in terms of anabolic and androgenic effects?
3. What are the clinical uses of synthetic progesterones, and how do they differ in potency compared to natural progesterone?
4. How do estriol, estradiol, and estrone differ in terms of their potency and roles in female physiology?
5. What is the significance of diethylstilbestrol (DES) in the history of sex hormone therapy, and what were the health risks associated with its use?

6. What are the side effects of long-term testosterone therapy, and how can they be managed in clinical practice?
7. How do synthetic progestins (like Norgestrel and Levonorgestrel) differ from natural progesterone in terms of their effects on the menstrual cycle and fertility?
8. What is the mechanism by which testosterone and nandrolone exert their anabolic effects on muscle tissue?

Drugs for Erectile Dysfunction:

1. How does Sildenafil (Viagra) work to treat erectile dysfunction, and what is its mechanism of action at the molecular level?
2. What are the pharmacokinetic differences between Sildenafil and Tadalafil in terms of onset of action and duration of effect?
3. What are the potential side effects and contraindications of using drugs like Sildenafil for erectile dysfunction?
4. How do PDE5 inhibitors like Sildenafil and Tadalafil affect smooth muscle relaxation in the penile tissues?
5. What are the potential interactions between Sildenafil and other cardiovascular drugs, particularly nitrates?
6. How does Tadalafil's long half-life impact its clinical use compared to Sildenafil for the treatment of erectile dysfunction?

Oral Contraceptives:

1. What is the mechanism of action of Mifepristone as an oral contraceptive, and how does it interfere with pregnancy?
2. How does Norgestrel compare to Levonorgestrel in terms of progestogenic activity and contraceptive efficacy?
3. What are the potential side effects of oral contraceptives containing synthetic progestins, and how do they differ from those containing only estrogens?
4. How do combined oral contraceptives (containing both estrogen and progestin) work to inhibit ovulation and prevent pregnancy?
5. What are the benefits and risks of using Mifepristone in emergency contraception?
6. How does Levonorgestrel as an emergency contraceptive prevent pregnancy, and what is the optimal time frame for its effectiveness?
7. What are the potential drug interactions with oral contraceptives, and how might they affect contraceptive efficacy?

Corticosteroids:

1. What is the mechanism of action of corticosteroids like Hydrocortisone and Prednisolone in reducing inflammation?
2. How do corticosteroids like Dexamethasone and Betamethasone differ from Hydrocortisone in terms of anti-inflammatory potency and side effects?
3. What are the therapeutic uses of Prednisolone and Betamethasone in the management of autoimmune and inflammatory conditions?
4. What are the potential adverse effects of long-term corticosteroid use, particularly related to the cardiovascular, metabolic, and immune systems?
5. How does the body's natural feedback regulation of cortisol production interact with exogenous corticosteroid therapy?
6. How does Dexamethasone compare to other corticosteroids in the management of conditions like adrenal insufficiency or severe allergic reactions?

7. What is the role of corticosteroids in the management of asthma, and how does the use of inhaled corticosteroids differ from oral or systemic administration?

Thyroid and Antithyroid Drugs:

1. What is the mechanism of action of L-Thyroxine (T4) in treating hypothyroidism, and how is its dosage adjusted based on individual patient needs?
2. How does L-Thyronine (T3) differ from L-Thyroxine (T4) in terms of potency and clinical use for thyroid hormone replacement?
3. What are the primary clinical uses of Propylthiouracil and Methimazole in the treatment of hyperthyroidism, and how do they inhibit thyroid hormone production?
4. What are the potential side effects of antithyroid drugs like Propylthiouracil and Methimazole, particularly related to the immune system?
5. How does the action of Propylthiouracil in inhibiting thyroid peroxidase differ from the mechanism of Methimazole in blocking the synthesis of thyroid hormones?
6. What role do thyroid drugs like L-Thyroxine and L-Thyronine play in managing thyroid cancer and post-thyroidectomy care?
7. What are the common symptoms of hypothyroidism, and how does L-Thyroxine help in alleviating these symptoms?
8. What are the main considerations when prescribing L-Thyroxine for elderly patients with hypothyroidism, especially regarding cardiovascular risk?

UNIT – V 07 Hours

Antidiabetic agents:
Insulin and its preparations Sulfonyl ureas: Tolbutamide*, Chlorpropamide, Glipizide, Glimepiride. Biguanides: Metformin. Thiazolidinediones: Pioglitazone, Rosiglitazone. Meglitinides: Repaglinide, Nateglinide. Glucosidase inhibitors: Acrabose, Voglibose.
Local Anesthetics: SAR of Local anesthetics
Benzoic Acid derivatives; Cocaine, Hexylcaine, Meprylcaine, Cyclomethycaine,Piperocaine.
Amino Benzoic acid derivatives: Benzocaine*, Butamben, Procaine*, Butacaine, Propoxycaine, Tetracaine, Benoxinate.
Lidocaine/Anilide derivatives: Lignocaine, Mepivacaine, Prilocaine, Etidocaine.
Miscellaneous: Phenacaine, Diperodon, Dibucaine.*

Antidiabetic Agents:

Insulin and Its Preparations:

1. What are the different types of insulin preparations, and how do they vary in terms of onset, peak action, and duration of action?
2. How does insulin glargine differ from regular insulin in terms of pharmacokinetics and clinical use?
3. What are the potential complications and adverse effects of insulin therapy, particularly with rapid-acting and long-acting insulin analogs?
4. How does insulin resistance contribute to the development of type 2 diabetes, and how do insulin preparations help in managing it?

5. What are the primary factors influencing the choice of insulin therapy for patients with diabetes, including considerations of age, comorbidities, and lifestyle?

Sulfonylureas:

1. What is the mechanism of action of sulfonylureas like Tolbutamide and Chlorpropamide in managing type 2 diabetes?
2. How does Glimepiride differ from Glipizide in terms of pharmacodynamics and clinical effectiveness?
3. What are the key side effects of sulfonylureas, and how do they compare to other oral antidiabetic agents in terms of safety and efficacy?
4. What is the role of sulfonylureas in combination therapy for type 2 diabetes, and what are the potential benefits and risks of such combinations?

Biguanides:

1. How does Metformin help lower blood glucose levels in patients with type 2 diabetes, and what is its primary mechanism of action?
2. What are the most common side effects of Metformin, and how can they be managed in clinical practice?
3. What are the contraindications for Metformin use, and why is it avoided in patients with renal impairment or lactic acidosis?

Thiazolidinediones:

1. How do Pioglitazone and Rosiglitazone work to improve insulin sensitivity in type 2 diabetes?
2. What are the potential risks and side effects associated with thiazolidinediones, particularly related to cardiovascular health and fluid retention?
3. How does Pioglitazone differ from Rosiglitazone in terms of efficacy, safety profile, and regulatory status?

Meglitinides:

1. What is the mechanism of action of Repaglinide and Nateglinide in stimulating insulin release, and how do they differ from sulfonylureas?
2. What are the advantages of using meglitinides over sulfonylureas in patients with type 2 diabetes, especially in relation to postprandial blood sugar control?
3. What are the potential risks and side effects of meglitinides, and how should they be monitored in patients with type 2 diabetes?

Glucosidase Inhibitors:

1. How do glucosidase inhibitors like Acarbose and Voglibose work to reduce postprandial blood glucose levels in patients with diabetes?
2. What are the common gastrointestinal side effects of Acarbose and Voglibose, and how can they be managed to improve patient compliance?
3. What role do glucosidase inhibitors play in combination therapy for type 2 diabetes, and how do they enhance the effectiveness of other antidiabetic agents?

Local Anesthetics:

SAR of Local Anesthetics:

1. What are the key structural features (SAR) that influence the potency, duration, and side effects of local anesthetics?
2. How do the hydrophobic and hydrophilic properties of local anesthetics affect their ability to block sodium channels?
3. What is the importance of the ester or amide linkage in local anesthetic molecules, and how does this affect their metabolism and toxicity?

Benzoic Acid Derivatives:

1. What is the mechanism of action of Cocaine as a local anesthetic, and how does it differ from other local anesthetics in terms of both anesthetic and sympathomimetic effects?
2. How do Hexylcaine and Meprylcaine compare to Cocaine in terms of their anesthetic potency and risk of toxicity?
3. What are the clinical uses and side effects of Piperocaine and Cyclomethycaine, and how do they compare to other benzoic acid derivatives?

Amino Benzoic Acid Derivatives:

1. How does Benzocaine work as a local anesthetic, and why is it primarily used topically rather than by injection?
2. What are the differences in the duration and intensity of action between Procaine and Tetracaine?
3. What is the role of Butamben in clinical practice, and how does it compare to other local anesthetics in terms of toxicity and onset of action?
4. What are the potential allergic reactions associated with Ester-type local anesthetics like Procaine, and how do they differ from the reactions seen with Amide-type anesthetics?
5. How does Tetracaine's potency and duration of action make it a preferred choice for certain surgical procedures?

Lidocaine/Anilide Derivatives:

1. What is the mechanism of action of Lidocaine as a local anesthetic, and how does its amide structure affect its pharmacokinetics?
2. How does the onset and duration of action of Mepivacaine compare to Lidocaine, and in what clinical situations is Mepivacaine preferred?
3. What are the advantages of Prilocaine over Lidocaine in terms of toxicity and its role in specific types of regional anesthesia?
4. What is the clinical use of Etidocaine, and how does its prolonged duration of action benefit certain procedures like epidural anesthesia?

Miscellaneous Local Anesthetics:

1. What is the mechanism of action of Dibucaine, and how does it compare to other local anesthetics in terms of potency and duration?
2. What are the potential adverse effects of Dibucaine, and how should they be managed in clinical practice?
3. How does the use of Phenacaine in ocular anesthesia compare to other local anesthetics like Tetracaine and Procaine?
4. What is the role of Diperodon in dental anesthesia, and how does its effectiveness compare to more commonly used agents like Lidocaine and Mepivacaine?

END THEORY EXAM QUESTION PAPER (JNTUA)

Code: BP501T **R19**

B.Pharm III Year I Semester (R19) Regular & Supplementary Examinations December 2024

MEDICINAL CHEMISTRY – II

(B.Pharmacy)

Time: 3 hours Max. Marks: 75

PART – A

(Compulsory Question)

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1		Answer the following: (10 X 02 = 20 Marks)	
	(a)	Write the structure and uses of Cisplatin.	2M
	(b)	Write the name and mechanism of action of plant products as anticancer agents.	2M
	(c)	Define and give example for Vasodilators.	2M
	(d)	Structure and mechanism of action of Furosemide	2M
	(e)	Give the mechanism of action of anticoagulants. Write the structure of any one anti coagulant.	2M
	(f)	Define Cardiotonics and give examples.	2M
	(g)	Write the clinical importance of thyroid hormones.	2M
	(h)	Give the structure and medicinal uses of Betamethasone.	2M
	(i)	Write a note on glucosidase inhibitors as antidiabetic agents.	2M
	(j)	Draw the structure and give the uses of Cocaine.	2M

PART – B

(Answer any two questions: 02 X 10 = 20 Marks)

2	(a)	What are antihistamines? What do you mean by H1 & H2-receptor antagonists?	3M
	(b)	Give the structures of any two antihistamines with pyrimidine nucleus. Add a note on synthesis of Promethazine HCl.	7M
3	(a)	Write the classification of diuretics.	4M
	(b)	Explain the chemistry of thiazide diuretics. Write synthesis of Chlorthiazide.	6M
4	(a)	Classify antiarrhythmic drugs.	4M
	(b)	Write the structure and MOA of Lidocaine hydrochloride.	6M

PART – C

(Answer any seven questions: 07 X 05 = 35 Marks)

5	Write a note on anticancer antibiotics. Explain chemistry and MOA of any one drug.	5M
6	Explain the mechanism of action of organic nitrates and nitrites as antianginal drugs.	5M
7	Describe the chemistry, mechanism and uses of calcium channel blockers.	5M
8	What are Anticoagulants? Give the synthesis of Warfarin.	5M
9	Classify anti-hyperlipidemic agents with their structures.	5M
10	Describe the medicinal chemistry of aspect of Corticosteroids.	5M
11	Write a note on thyroid hormones. Give the structure of L-Thyroxine and L-Thyronine.	5M
12	Explain the mechanism of action of biguanides as antidiabetic drugs. Give the structure and uses of Metformin.	5M
13	Write the synthesis and mechanism of action of Benzocaine.	5M

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