



HINDU COLLEGE OF PHARMACY (AUTONOMOUS)
Amaravathi Road – GUNTUR -522002. A.P.

Regd. No:

MPA/MPC/MPL-101T

Total No. of Questions: 14

Total No. of Pages: 2

I/II M. Pharmacy Regular Degree 1st Semester end Theory Examinations
April, 2026 - (Admitted in 2025-2026 Autonomous Batch)

Common Paper for
Pharmaceutical Analysis/Pharmaceutical Chemistry/ Pharmacology

Subject Code & Name: MPA/MPC/MPL-101T Modern Pharmaceutical Analytical Techniques.

Time Duration: 3.00 Hrs.

Max. Marks: 75 Marks.

CO1	The analysis of various drugs in single and combination dosage forms
CO2	To Determine the Compounds by Spectroscopy Techniques.
CO3	To Determine the compounds by Chromatography Techniques.
CO4	To Determine the Compounds by Electrochemical and thermal methods.
CO5	To Interpret the Compounds by various analytical Techniques.

Bloom's Taxonomy Levels-(BL) (L1-Remembering, L2-Understanding, L3–Applying, L4-Analysing, L5–Evaluating, L6-Creating)

SECTION – A

ANSWER ANY FIVE QUESTIONS

(5 X 10M = 50 Marks)

Q. No.	Questions	Marks	CO	BL
1	Explain the construction and working of the UV-Visible spectrophotometer with a neat diagram. Discuss pharmaceutical applications and solvent effects.	10	CO1	L3
2	Describe the NMR spectroscopy principle. Explain chemical shift, spin-spin coupling, and coupling constant with examples and pharmaceutical applications.	10	CO2	L3
3	Discuss ionization techniques in mass spectroscopy (EI, ESI, MALDI). Explain quadrupole and TOF analyzers with diagrams.	10	CO2	L4
4	Define chromatographic parameters affecting resolution. Explain the HPLC principle, instrumentation, and applications with a flow diagram.	10	CO3	L4
5	Describe capillary electrophoresis and isoelectric focusing with labelled diagrams. Discuss separation factors.	10	CO3	L4
6	Explain the DSC principle and instrumentation. Discuss pharmaceutical applications and error sources.	10	CO4	L3
7	a) Compare Flame Emission Spectroscopy and Atomic Absorption Spectroscopy. b) Explain potentiometry with ion-selective electrodes and applications.	10	CO5	L4

SECTION – B

ANSWER ANY FIVE QUESTIONS

(5 X 5M = 25 Marks)

Q. No.	Questions	Marks	CO	BL
8	Write a note on the FTIR spectrometer and vibrational frequency factors.	5	CO1	L3
9	Explain the role of solvents in NMR and the nuclear Overhauser effect (NOE).	5	CO2	L3
10	Describe mass fragmentation rules and metastable ions.	5	CO2	L4
11	Differentiate TLC and HPTLC with applications.	5	CO3	L3
12	State Bragg's law. Explain the X-ray powder diffraction technique.	5	CO3	L3
13	Write a short note on TGA and its advantages.	5	CO4	L3
14	Enlist spectrofluorimetry quenchers. Differentiate DTA and DDTA.	5	CO5	L4





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MPC-102T

Total No. of Questions: 14

Total No. of Pages: 02

I/II M. Pharmacy Regular Degree 1st Semester end Theory Examinations
April, 2026 - (Admitted in 2025-2026 Autonomous Batch)
Pharmaceutical Chemistry Specialization

Subject Code & Name: MPC-102T Advanced Organic Chemistry-I.

Time Duration: 3.00 Hrs.

Max. Marks: 75 Marks.

CO1	To provide in-depth knowledge about advances in organic chemistry, different techniques of organic synthesis and their applications to process chemistry as well as drug discovery.
CO2	The principles, mechanism of retrosynthesis and applications of various named reactions
CO3	The concept of disconnection to develop synthetic routes for small target molecule.
CO4	The various catalysts used in organic reactions
CO5	The chemistry of heterocyclic compounds

Bloom's Taxonomy Levels-(BL) (L1-Remembering, L2-Understanding, L3–Applying, L4-Analysing, L5–Evaluating, L6-Creating)

SECTION – A

ANSWER ANY FIVE QUESTIONS

(5 X 10M = 50 Marks)

Q. No.	Questions	Marks	CO	BL
1	A. Compare and contrast properties & stability of Carbocations, carbanions and free radicals	5 M	1	L3
	B. Distinguish the reaction mechanism and factors affecting SN ¹ & SN ² mechanisms	5M	1	L4
2	Explain reaction mechanism & synthetic applications of a) Ulmann Coupling b) Baeyer-Villiger reactions	10 M	2	L2&L3
3	A. Write the synthetic applications of Aluminium isopropoxide	5M	3	L3
	B. How do you protect carboxyl group in synthesis of acetals & ketals	5M		L6
4	Describe the synthesis of 2 antifungal drugs containing Imidazole moiety	10 M	4	L5
5	Describe the reaction & applications of Traub Purine synthesis	10 M	4	L3
6	Define Retrosynthesis & explain steps involved in retrosynthesis	10 M	5	L1
7	Explain different strategies for synthesis of five membered & six membered rings	10 M	5	L2

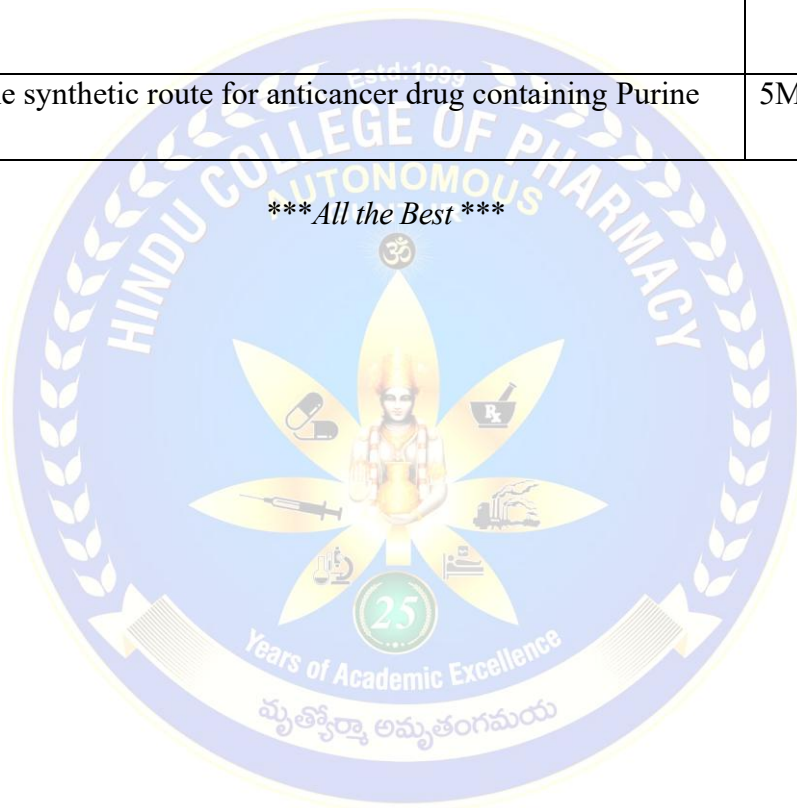
SECTION – B

ANSWER ANY FIVE QUESTIONS

(5 X 5M = 25 Marks)

Q. No.	Questions	Marks	CO	BL
8	List out the various organic reaction mechanisms with examples	5 M	1	L5
9	Describe the Saytzeff rule with reaction mechanism	5M	1	L1&L2
10	Which multicomponent reaction is used to synthesize bis amides. Explain	5M	2	L4
11	Which reaction is used to synthesize aryl halides, and nitriles. Explain	5M	2	L5
12	Write any 2 synthetic applications of Triphenyl phosphine	5M	3	L2
13	Write the synthesis and uses of Chlorpromazine	5M	4	L3& L4
14	Write any one synthetic route for anticancer drug containing Purine moiety	5M	4	L4

All the Best





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Pharmaceutical Chemistry Specialization

Subject Code & Name: MPC-103T Advanced Medicinal Chemistry.

Time Duration: 3.00 Hrs.

Max. Marks: 75 Marks.

CO-1	The subject is designed to impart knowledge about recent advances in the field of medicinal chemistry at the molecular level including different techniques for the rational drug design.
CO-2	Discuss about Different stages of drug discovery and Role of medicinal chemistry in drug research
CO-3	Different techniques for drug discovery
CO-4	Various strategies to design and develop new drug like molecules for biological targets
CO-5	Chemistry of Peptidomimetics

Bloom's Taxonomy Levels-(BL) (L1-Remembering, L2-Understanding, L3–Applying, L4-Analysing, L5–Evaluating, L6-Creating)

SECTION – A

ANSWER ANY FIVE QUESTIONS

(5 X 10M = 50 Marks)

Q. No.	Questions	Marks	CO	BL
1	Define drug discovery. Describe the steps involved in the identification, validation & diversity of drug targets.	10	1, 2 & 3	L1
2	Explain the types of drug receptors with examples. Add a note on receptor binding sites and their induction of biological activity.	10	2	L2
3	Explain the rational design and practical consideration of prodrug design	10	1 & 3	L2
4	Discuss the strategies utilized in analog design of drug molecules.	10	3	L2
5	Describe the SAR and mechanism of action of beta blockers	10	4	L2
6	Explain rational design of non-covalently binding enzyme inhibitors with examples	10	4	L2
7	Explain in detail about the enzyme kinetics.	10	4	L2

SECTION – B

ANSWER ANY FIVE QUESTIONS

(5 X 5M = 25 Marks)

Q. No.	Questions	Marks	CO	BL
8	Write a note on artificial enzymes.	5	2	L5
9	Explain the strategies to combat drug resistance in antibiotics.	5	3	L2
10	Write the mechanism of action and synthesis of any one anti-hypertensive agent.	5	3	L5
11	Explain the role of chirality in stereo-selective therapeutic agent	5	3	L2
12	Explain about the reversible enzyme inhibitors.	5	4	L2
13	Explain the chemistry of prostaglandins	5	5	L2
14	Describe about the design of peptidomimetics by manipulation of the amino acids.	5	5	L2



SCHEME OF VALUATION
SECTION – A

ANSWER ANY FIVE QUESTIONS**(5 X 10M = 50 Marks)**

1. Definition of drug discovery - 1 Mark
Steps involved in identification - 3 Marks
Steps involved in validation - 3 Marks
Diversity of drug targets - 3 Marks
2. Types of drug receptors - 3 Marks
Examples - 2 Marks
Receptor binding sites - 5 Marks
3. Prodrug Design- rational - 5 Marks
It's Practical consideration - 5 Marks
Synthesis of ipratropium - 3 Marks
4. Strategies in analog design - 7 Marks
Examples - 3 Marks
5. SAR of beta blocker - 5 Marks
Mechanism of beta blockers - 5 Marks
6. Design of enzyme inhibitors - 5 Marks
Examples - 5 Marks
7. Minimum 10 points to be written along with examples. Each point carries one mark

SECTION – B**ANSWER ANY FIVE QUESTIONS****(5 X 5M = 25 Marks)**

8. Minimum 5 points to be written along with examples. Each point carries one mark
9. Minimum 5 Strategies - 5 Marks
10. MOA of anti-hypertensive drug - 2.5 Marks
Synthesis - 2.5 Marks
11. Minimum 5 points to be written along with examples. Each point carries one mark
12. Minimum 5 points to be written along with examples. Each point carries one mark
13. Structure of Prostaglandins - 2 Marks
Chemistry of prostaglandins - 3 Marks
14. Any five methods of peptidomimetics design - 5 Marks



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Pharmaceutical Chemistry Specialization

Subject Code & Name: MPC-104T Chemistry of Natural Products.

Time Duration: 3.00 Hrs.

Max. Marks: 75 Marks.

CO1	Different types of natural compounds, their chemistry and medicinal importance.
CO2	The importance of natural compounds as lead molecules for new drug discovery.
CO3	The concept of r DNA technology tool for new drug discovery
CO4	General methods of structural elucidation of compounds of natural origin
CO5	Isolation, purification and characterization of simple chemical constituents from natural source.
CO6	Identification, Characterization of natural compound by I.R, H-NMR, C ¹³ -NMR and Mass spectrums.

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SECTION – A

ANSWER ANY FIVE QUESTIONS

(5 X 10M = 50 Marks)

Q. No.	Questions	Marks	CO	BL
1	(a) Discuss the biological source, structure, extraction, chemistry and mechanism of action of morphine	5	CO1	L6
	(b) Determine the Structure-Activity Relationship of Paclitaxel	5	CO1	L5
2	Justify the Structural elucidation of emetine and ephedrine	5 + 5	CO2	L5
3	Define gene therapy. Explain the types, mechanisms, vectors, recent advances and applications of Gene therapy	10	CO3	L5
4	Discuss the chemical constituents, mechanism of action, and uses <i>Salacia reticulate</i> and <i>Pterocarpus marsupium</i>	5 + 5	CO4	L6
5	Explain the characterization of quercetin and Vitamin D3 by ¹ H-NMR and ¹³ C-NMR and MS/MS Spectrometer	10	CO5	L5
6	(a) Explain how Antimalarial Drugs Acted as lead and classify based on chemical structures.	5	CO1	L5
	(b) Write the principles in the estimation of RNA & DNA	5	CO3	L2
7	Categorize the structure, mechanism of action, SAR, metabolism, adverse effects and uses of oestriol and oestradiol	5 + 5	CO2	L5

SECTION – B

ANSWER ANY FIVE QUESTIONS

(5 X 5M = 25 Marks)

Q. No.	Questions	Marks	CO	BL
8	Give an outline of the chemistry of Lovastatin and Dicoumarol	5	CO1	L2
9	Explain the general method of Isolation of flavonoids	5	CO2	L5
10	Discuss the principle, procedure and applications of Hybridoma Technology	5	CO3	L6
11	Examine the chemical constituents, mechanism of action, and uses <i>Phyllanthus niruri</i>	5	CO4	L4
12	Determine the characterization of penicillin by ^1H -NMR and ^{13}C -NMR and MS/MS Spectrometer	5	CO5	L5
13	Illustrate notes on applications of rDNA Technology	5	CO3	L2
14	Discuss the chemical constituents, mechanism of action, and uses <i>Curcuma longa</i> . Linn	5	CO4	L6

