

 ARKA JAIN University Jharkhand				[12-05-2025] END SEM EXAMINATION School of Health & Allied Sciences	
Program		Bachelor of Pharmacy			
Subject Name		Herbal Drug Technology		Session	Even, 2024-2025
Semester		VI		Year	May, 2025
Time: 3 Hour Max. Marks : 75		• Start writing from 2nd page onwards; <u>don't Write on the 1st Page Backside</u> • Answer all Questions of Section A (Compulsory) • Answer Any <i>Two</i> out of <i>Three</i> of Section B • Answer Any <i>Seven</i> out of <i>Nine</i> of Section C • Possession of Mobile Phones or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will comes under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Papers.</u>			
		Knowledge Level (KL)		K1 : Remembering K2 : Understanding	K3 : Applying K4 : Analysing

Section A (Each question Carry 01 Mark from Q1-i to xx) – 20 Marks					
Q. N I	QUESTIONS	Marks	COs	KL	PO
i	Which of the following is NOT a method for herbal drug identification? a) Microscopy b) Organoleptic evaluation c) High-performance liquid chromatography d) Ultraviolet radiation exposure	1	CO1	K1, K2	PO1
ii	Primary sources of herbal raw materials include: a) Synthetic compounds b) Plants, marine organisms, fungi c) Petroleum byproducts d) Metals and minerals	1	CO1	K2	PO2
iii	Good collection practices ensure: a) Standardized quality of herbs b) Maximum yield without quality concern c) Quick and bulk collection d) Unregulated harvesting	1	CO1	K1	PO1
iv	Which of the following is a biopesticide? a) Neem extract b) DDT c) Lead arsenate d) Chlorpyrifos	1	CO2	K1	PO2
v	The classical Ayurvedic formulation "Chyawanprash" is categorized as:	1	CO2	K3	PO1

	a) Arishta d) Bhasma	b) Asava c) Lehya				
vi	Arishta is a fermented preparation that contains:		1	CO2	K2	PO1
	a) Alkaloids c) Alcohol	b) Essential oils d) Tannins				
vii	Which herbal supplement is beneficial for cardiovascular diseases?		1	CO1	K1, K2	PO1
	a) St. John's Wort c) Ginseng	b) Garlic d) Valerian				
viii	Herb-drug interaction of black pepper is due to:		1	CO2	K4	PO1
	a) Piperine c) Anthocyanin	b) Caffeine d) Lignin				
ix	Amla is used in hair care products due to its high content of:		1	CO4	K2	PO2
	a) Vitamin C c) Iron	b) Calcium d) Alkaloids				
x	Acacia is used as a:		1	CO3	K1	PO1
	a) Sweetener c) Binder	b) Diluent d) Colorant				
xi	Phytosomes are advanced herbal formulations that improve:		1	CO3	K3	PO1
	a) Taste c) Stability	b) Bioavailability d) Color				
xii	WHO guidelines for herbal medicines emphasize:		1	CO5	K1	PO2
	a) Standardization and safety b) Only traditional use c) Free market sale d) High synthetic content					
xiii	The protection of traditional herbal knowledge is under:		1	CO5	K2	PO1
	a) TRIPS agreement b) Schedule T c) Ayurvedic Drug Act d) Good Agricultural Practices					
xiv	Schedule T of the Drug and Cosmetic Act deals with:		1	CO5	K1	PO2
	a) Good Manufacturing Practices for Ayurvedic, Siddha, and Unani drugs b) Synthetic drug quality					

	c) Homeopathy formulations d) Veterinary medicine					
xv	The main purpose of drying herbal drugs is to:		1	CO4	K1, K2	PO1
	a) Increase moisture content b) Enhance microbial growth c) Improve stability and shelf life d) Change the chemical composition					
xvi	Organic farming excludes the use of:		1	CO1	K2	PO2
	a) Crop rotation b) Synthetic fertilizers and pesticides c) Composting d) Biological pest control					
xvii	Siddha medicine primarily utilizes:		1	CO2	K2	PO1
	a) Synthetic drugs b) Herbs and minerals c) Homeopathic dilutions d) Modern antibiotics					
xviii	Bhasma formulations involve:		1	CO2	K3	PO1
	a) Drying under shade b) Fermentation c) Calcination at high temperature d) Cold extraction					
xix	Omega-3 fatty acids are beneficial for:		1	CO4	K1, K2	PO1
	a) Digestive issues b) Cardiovascular health c) Respiratory infections d) Kidney stones					
xx	Farmers' rights ensure:		1	CO6	K2	PO1
	a) Ownership and benefit-sharing b) Selling without documentation c) Export bans d) Mixing synthetic and herbal products					
Section B (Answer any TWO out of THREE) - 20 Marks (Each question Carry 10 Marks)						
Q. No.	QUESTIONS	Marks	COs	KL	PO	
2	Discuss the concept of drug proving in homeopathy and elaborate on the process of drug potentization in homeopathic remedies.	10	CO2	K4	PO1	
3	Describe the herbs used in hair care in detail with example.	10	CO3	K1, K2	PO1	

Q. No.	QUESTIONS	Marks	COs	KL	PO
4	How do the WHO and ICH guidelines establish regulatory frameworks for the assessment, standardization, and quality control of herbal drugs?	10	CO5	K1	PO2
Section C (Answer any SEVEN out of NINE) – 35 Marks (Each question Carry 05 Marks)					
5	What are the potential interactions of pepper with medications or other substances, and what are the associated side effects?	5	CO2	K1, K2	PO2
6	Discuss the steps involved in Lehya and Gutika preparation.	5	CO2	K3	PO1
7	Write about preparation and evaluation of Herbal formulations like Tablet.	5	CO3	K1, K3	PO1
8	Write a note on herbs as health food. a) Garlic b) Amla.	5	CO1	K2	PO2
9	Write a note on selection & identification of herbal material.	5	CO1	K1, K2	PO1
10	Write a note on natural colourants, binders and diluents.	5	CO3	K2	PO2
11	What are the health benefits and the role of nutraceuticals in the management of cardiovascular diseases (CVD)?	5	CO2	K1	PO1
12	Define Herbal Medicine and mention the key steps in the processing of herbal raw materials.	5	CO1	K1, K2	PO1
13	Discuss the role of Patent and IPR in herbal medicine, along with the importance of Breeder's and Farmer's Rights.	5	CO6	K1, K2	PO2

CO- Course Outcomes,

KL- Knowledge Level,

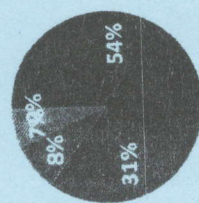
PO – Program Outcome

Course Outcomes	CO1	CO2	CO3	CO4	CO5	CO6
Acquire knowledge about the recognition, collection and preservation of medicinal plants.						
Know the Indian system of medicines, herb-drug and herb-food interactions.						
Know the formulation and standardization of herbal cosmetics, other herbal formulations.						
Study the phytochemical screening of crude drugs.						
Know the WHO and ICH guidelines for evaluation of herbal drugs.						
Know the patenting aspects related to herbal drugs and about the GMP of Indian system of medicines.						

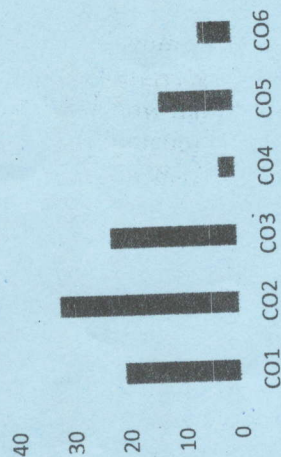
GRAPHICAL REPRESENTATION

BLOOM'S LEVEL WISE MARKS DISTRIBUTION

■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6



COURSE OUTCOMEWISE MARKS DISTRIBUTION



 ARKA JAIN University Jharkhand		NAAC GRADE ACCREDITED UNIVERSITY 		[19-05-2025] END SEM EXAMINATION School of Health & Allied Sciences	
Program	Bachelor of Pharmacy				
Subject Name	Quality Assurance				
Semester	VI		Session	Even, 2024-2025	
			Year	May, 2025	
Start writing from 2nd page onwards; don't write on the 1st Page					
Backside Answer all Questions of Section A (Compulsory) Answer Any <i>Two</i> out of <i>Three</i> of Section B Answer Any <i>Seven</i> out of <i>Nine</i> of Section C Possession of Mobile Phones or any kind of <u>Written Material</u> , <u>Arguments with the Invigilator or Discussing with Co-Student</u> will comes under <u>Unfair Means</u> and will <u>Result in the Cancellation of the</u> <u>Papers.</u>					
Knowledge Level (KL)	K1 : Remembering		K3 : Applying		K5 : Evaluating
	K2 : Understanding		K4 : Analysing		K6 : Creating

Section A (Each question Carry 01 Mark from Q1-i to xx) – 20 Marks					
Q. N1	QUESTIONS	Marks	COs	KL	PO
i	QA is: a) After production c) Customer-based The main philosophy of TQM is: a) One-time inspection b) Mass production c) Continuous improvement d) Reducing cost	1	CO1, CO6	K1, K2	PO1
ii		1	CO5, CO6	K1, K2	PO2
iii	QC identifies: a) Market share c) Revenue b) Defects d) Packing	1	CO1, CO6	K2, K4	PO2
iv	The PDCA cycle in TQM stands for: a) Plan-Do-Check-Act b) Process-Design-Control-Analysis c) Prepare-Define-Control-Achieve d) Plan-Develop-Control-Audit	1	CO1, CO4	K1, K2	PO1
v	ICH stands for: a) International Committee for Healthcare b) International Council for Harmonisation c) Institute of Clinical Health d) International Center for Hygiene	1	CO3, CO6	K1, K2	PO1
vi	Which QbD tool is used for visualizing cause-effect relationships?	1	CO1,	K1,	PO2

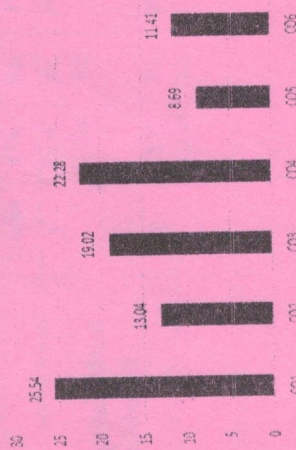
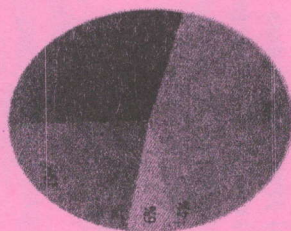
vii	a) Pareto chart c) Control chart Which of the following is NOT a QbD tool? a) DoE c) Six Sigma	b) Ishikawa diagram d) Pie chart	1	CO1, CO2	K1, K2	PO1
viii	ISO 14000 is for: a) Quality c) Drugs	b) Environment d) Cost	1	CO3, CO4	K1, K2	PO1
ix	NABL accreditation is granted by: a) Ministry of Health c) Quality Council of India (QCI)	b) CDSCO d) ISO India	1	CO2, CO4	K2, K3	PO2
x	What is the primary objective of personnel training in a pharmaceutical manufacturing facility? a) Reduce costs b) Boost morale c) Ensure compliance and quality d) Raise expenses		1	CO4, CO5	K1, K2	PO2
xi	What is the purpose of equipment calibration? a) Improve appearance b) Ensure operational accuracy c) Speed up production d) Extend warranty		1	CO2, CO5	K2, K3	PO2
xii	Which of the following documents provides step-by-step instructions to carry out routine operations? a) Batch Manufacturing Record b) Quality Audit Report c) Standard Operating Procedure (SOP) d) Product Recall Report		1	CO1, CO4	K1, K2	PO2
xiii	The purpose of a product recall in the pharmaceutical industry is to: a) Promote the product in the market b) Eliminate expired raw materials c) Remove potentially defective products from distribution d) Reduce production costs		1	CO1, CO4	K1, K2	PO2
xiv	Validation is important in the pharmaceutical industry to: a) Increase shelf-life of products b) Consistency and quality c) Reduce cost of materials d) Improve taste of medicine		1	CO2, CO5	K2, K3	PO2

xv	Aeration in fermentation is used to: a) Heat the medium b) Supply oxygen for microbial growth c) Stir the culture manually d) Remove waste gases	1	CO3, CO5	K2, K4	PO2
xvi	In pharmaceutical warehousing, Griseofulvin should be protected from: a) Oxygen only c) Moisture and light b) Cold storage d) Nitrogen	1	CO4, CO5	K1, K2	PO2
xvii	In GLP, which of the following components focuses on lab design & cross-contamination: a) Facilities b) Protocol for Conduct c) Records and Reports d) General Provisions	1	CO3	K2, K5	PO1
xviii	Final batch release is authorized by: a) Production supervisor b) Sales manager c) Quality Assurance (QA) department d) Quality Control (QC) department	1	CO1, CO6	K1, K2	PO1
xix	QC tests on containers/closures ensure: a) Faster release b) Taste masking c) Product protection d) Higher bioavailability	1	CO1, CO6	K2, K5	PO2
xx	Which document is essential before purchasing new equipment? a) Vendor rating b) Equipment User Requirement Specification (URS) c) SOP d) BMR	1	CO1, CO4	K1, K2	PO2
Section B (Answer any TWO out of THREE) – 20 Marks (Each question Carry 10 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO
2	What is an SOP, and why is it important in pharmaceutical manufacturing?	10	CO3, CO4	K1, K2	PO1
3	What are ISO 9000 and ISO 14000 certifications, how are they obtained, and why are they important?	10	CO2, CO4	K1, K2	PO1
4	Explain the construction, sanitation, and environmental control of pharmaceutical premises. Why are they essential?	10	CO1, CO3	K1, K2, K6	PO1

Section C (Answer any SEVEN out of NINE) - 35 Marks					
(Each question Carry 05 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO
5	What are product recalls in the pharmaceutical industry? Briefly describe their types.	5	CO1, CO4	K1, K2	PO2
6	Explain the utilities and maintenance practices required in sterile areas.	5	CO1, CO2	K1, K3	PO1
7	What are the key elements of Total Quality Management (TQM)?	5	CO1, CO6	K2, K6	PO1
8	Design a layout of pharmaceutical premises for the tablet manufacturing section. Include a layout diagram.	5	CO3, CO5	K1, K2, K6	PO1
9	Write a short note on the Master Formula Record (MFR) and its significance.	5	CO3, CO6	K2, K4	PO2
10	Explain the procedure for evaluating complaints and the methods of pharmaceutical waste disposal.	5	CO4, CO5	K2, K5	PO1
11	What are the key elements and tools involved in a Quality by Design (QbD) program?	5	CO1	K1, K2	PO1
12	Describe the process of document maintenance in the pharmaceutical industry.	5	CO1, CO2	K2, K4	PO2
13	Explain the role and importance of the Quality Control (QC) and Quality Assurance (QA) departments.	5	CO1, CO6	K2	PO2

CO- Course Outcomes, KL- Knowledge Level, PO – Program Outcome

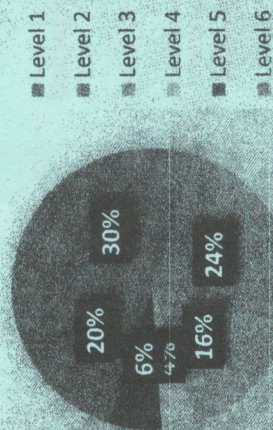
CO1	Understand the importance of quality in pharmaceutical products.
CO2	Know the importance of Good manufacturing practices and the factors affecting the quality of pharmaceuticals
CO3	Know the importance of Good laboratory practices and its documentation
CO4	Understand the various documentation processes
CO5	Understand calibration and validation and predict the error and the analysis root cause.
CO6	Know the process involved in manufacturing of pharmaceuticals in different departments.
GRAPHICAL REPRESENTATION	
Bloom's level wise marks distribution	
Course outcome wise marks distribution	



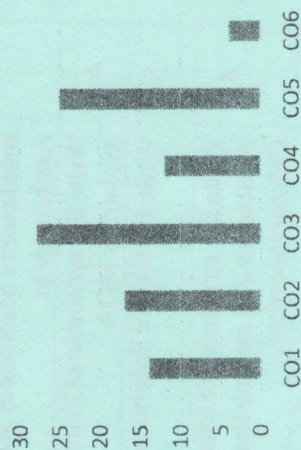
CO1	Know the correlating between pharmacology of a Infection disease and its management or cure.
CO2	Acquire knowledge about the rational drug design techniques.
CO3	Interpret the biological actions of any class of drugs through the study of quantitative structural activity relationship
CO4	Acquire knowledge about the pharmacodynamics of different class of medicinal compounds.
CO5	Acquire knowledge about the chemotherapy for infection diseases.
CO6	Understand the chemistry of drugs with respect to their pharmacological activity.

GRAPHICAL REPRESENTATION

Bloom's level wise marks distribution



Course Outcomewise Marks Distribution



ARKA JAIN
University
Jharkhand



[07-05-2025]
END SEM EXAMINATION
School of Health & Allied
Sciences

Program	Bachelor of Pharmacy		
Subject Name	Medicinal Chemistry-III	Session	Even, 2024-2025
Semester	VI	Year	May, 2025
Time: 3 Hour Max. Marks : 75	- Start writing from 2nd page onwards; don't Write on the 1st Page Backside - Answer all Questions of Section A (Compulsory) - Answer Any Two out of Three of Section B - Answer Any Seven out of Nine of Section C - Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will comes under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Papers.</u>		
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Section A (Each question Carry 01 Mark from Q1-i to xx) – 20 Marks

Q. N I	QUESTIONS	Marks	COs	KL	PO
i	Levamisole is: a) Anthelmintic c) Anti-fungal	1	CO5	K2, K1	PO9
ii	Dapsone is: a) Anti-protozoal c) Sulphonamides	1	CO3	K2, K1	PO1
iii	Injectable antibiotic is: a) Kanamycin c) Pyrazinamide	1	CO5	K5, K1	PO2
iv	Identify the CCR5 receptor inhibitor: a) Amantadine c) Raltegravir	1	CO2	K5	PO2
v	Urotropine is: a) Anthelmintic c) Anti-fungal	1	CO3	K2, K1	PO1
vi	Cycloserine is: a) ATT-drug c) Anthelmintic	1	CO1	K1	PO2
vii	Pamaquine is: a) Anti-malarial c) Both a and b	1	CO4	K1, K3	PO1

Section B (Answer any TWO out of THREE) - 20 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Classify Anti-UTI drugs with examples. Outline the synthesis of Ciprofloxacin. Write the MOA of Quinolones with its SOA.	10	CO5	K1, K2	PO1
3	What are Anti-protozoal drugs? Classify them with examples. Outline the synthesis of Metronidazole with its MOA.	10	CO3	K1, K2, K3, K6	PO2
4	What are Anti-fungal drugs? Classify them with examples and write the synthesis of Miconazole.	10	CO4	K2, K5, K6	PO1

Section C (Answer any SEVEN out of NINE) - 35 Marks
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
5	Explain the MOA, SOA and mode of resistance of Macrolides with structure of Azithromycin.	5	CO1	K2, K4	PO1
6	Write the synthesis of Trimethoprim and explain its MOA.	5	CO1, CO2	K1, K6	PO2
7	Write the SAR of Sulphonamides.	5	CO2	K3, K5	PO1
8	Write the structures of Miscellaneous Antibiotics and outline the synthesis of Chloramphenicol.	5	CO3	K1, K6	PO2
9	Write a short note on Benzimidazoles with examples of drugs and their structures.	5	CO3, CO2	K1, K2	PO2
10	Classify first line ATT drugs with examples and mention the MOA of Isoniazid.	5	CO3	K3, K6	PO4
11	Write down the synthesis of Sulphamethoxazole and mention its MOA and SOA.	5	CO3	K1, K3, K4	PO7
12	Outline the synthesis of Chloroquine and write its uses.	5	CO6	K6, K2, K3	PO2
13	Write a short note on Penicillin-structures, MOA and spectrum of activity.	5	CO3, CO	K1, K3	PO2

viii	Satranidazole is: a) Anthelmintic c) Anti-fungal b) Anti-protozoal d) None of these	1	CO2	K1, K4	PO1
ix	Thiacetazone belongs to the category of:- a) ATT-drug c) Anthelmintic b) Anti-fungal d) All of these	1	CO4	K2, K3	PO1
x	Casposfungin is: a) Anthelmintic c) Anti-fungal b) Anti-protozoal d) None of these	1	CO4	K2, K4	PO1
xi	Pyrantel is available as: a) Pamoate salt c) Both a and b b) chloride salt d) sulphate salt	1	CO3	K1, K2	PO2
xii	Amoebicides are: a) Anti-protozoal c) Sulphonamides b) Anti-viral d) Sulphones	1	CO3	K1, K2	PO1
xiii	Zidovudine is: a) Anthelmintic c) Anti-fungal b) Anti-protozoal d) None of these	1	CO1	K1, K2	PO2
xiv	Urotropine serves the same principal function as that of:- a) Metrifonate c) Nitrofurantoin b) Ornidazole d) Mafenide acetate	1	CO3	K1, K2	PO1
xv	Oxantel is: a) Anti-protozoal c) Anti-fungal b) Anthelmintic d) All of these	1	CO2	K1, K2	PO2
xvi	Zalcitabine is: a) Anti-viral c) Both a and b b) ATT d) None of these	1	CO2	K2, K3	PO2
xvii	Choose the drug containing Benzimidazole structure:- a) Mebendazole c) INH b) Levamisole d) Niridazole	1	CO2	K2, K3	PO2
xviii	Choose the Anti-fungal drug containing Imidazothiazole structure:- a) Miconazole c) INH b) Levamisole d) Niridazole	1	CO1, CO3	K4, K5	PO2
xix	Chloramphenicol's synthesis involves resolution with: a) D-camphoric acid c) Azodye b) D-glycerol d) None of these	1	CO4	K4, K5	PO1
xx	Metronidazole is: a) Anthelmintic c) Anti-fungal b) Anti-protozoal d) None of these	1	CO4	K4, K5	PO1

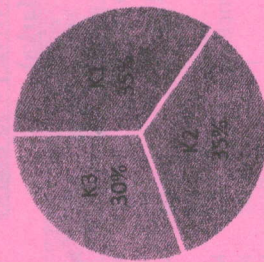
10	What are immunosuppressants and immunostimulants? Give examples. Write their applications	5	CO3	K2 K3	PO1
11	Classify anti-ulcer drugs. Write note on PPIs.	5	CO3	K1	PO1
12	Classify anti-amoebic agents. Discuss M.O.A and adverse effects of Metronidazole	5	CO3 CO4	K1 K2 K3	PO1
13	Classify anti-diarrhoeal drugs. Discuss the M.O.A and adverse effects of Sufasalazine.	5	CO1 CO2 CO3	K1 K2 K3	PO1

CO- Course Outcomes, KL- Knowledge Level, PO – Program Outcome

Course Outcomes	CO1	Understand the mechanism of drug action and its relevance in the treatment of different diseases
	CO2	Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
	CO3	Understand the mechanism of drug action and its relevance in the immunotherapy
	CO4	Appreciate correlation of pharmacology with related medical sciences.
	CO5	Understand about symptoms of several poisonings
	CO6	Understand the principles of toxicology and treatment of various poisonings

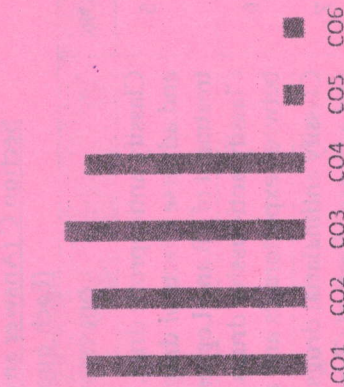
GRAPHICAL REPRESENTATION

Bloom's level wise marks distribution



* K1 = K2 = K3

Course outcome wise marks distribution



ARKA JAIN University Jharkhand		NAAC GRADE A ACCREDITED UNIVERSITY	END SEM EXAMINATION School of Health & Allied Sciences	[09-05-2025]
Program	Bachelor of Pharmacy	Session	Even, 2024-2025	
Subject Name	Pharmacology-III	Year	May, 2025	
Semester	VI			
• Start writing from 2nd page onwards; <u>don't Write on the 1st Page Backside</u> • Answer all Questions of Section A (Compulsory) • Answer Any <u>Two</u> out of <u>Three</u> of Section B • Answer Any <u>Seven</u> out of <u>Nine</u> of Section C • Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will comes under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Papers.</u>				
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Section A (Each question Carry 01 Mark from Q1-i to xx) – 20 Marks						
Q. N1	QUESTIONS	Marks	COs	KL	PO	
i	Which of the following drug acts as ulcer protective agent? a) Sodium Citrate c) Cimetidine	1	CO1 CO4	K1 K2 K3	PO1	
ii	Which among the following belongs to first generation Cephalosporin a) Cefepime c) Cefixime	1	CO1 CO4	K1 K2	PO1	
iii	Which of the following is not the adverse effect of Dapsone a) Fixed dose eruption c) Phototoxicity	1	CO1 CO2 CO3 CO4	K1 K2	PO1	
iv	Metronidazole is used in a) Amoebiasis c) Trichomonas vaginitis	1	CO1 CO2 CO4	K1 K2	PO1	
v	Which would be the most likely toxin treated with deferoxamine? a) Iron b) Mercury c) Lead d) None	1	CO5 CO6	K1 K2 K3	PO1	
vi	Which of the following belongs to non-opioids antitussives ? a) Dextromethorphan c) Ethyl morphine	1	CO1 CO2 CO4	K1	PO1	

vii	Tetracyclines are avoided during pregnancy because a) it is phototoxic b) It may affect the bone growth of fetus. c) it causes discoloration of mother's teeth d) it may cause abortion	1	CO3	K1 K2 K3	PO1
viii	Isoniazid inhibits the metabolism of all Except a) Theophylline b) Diazepam c) Carbamazepine d) None	1	CO1 CO2 CO3 CO4	K1 K2	PO1
ix	Match the following a) Microtubule disorientation i. Flucytosine b) Inhibit squalene epoxidase ii. Terbinafine c) Thymidylate synthesis inhibitor iii. Amphotericin B d) Micropore formation with ergosterol iv. Griseofulvin a. a (i), b(ii), c(iii), d (iv) b. a (iii), b(iv), c(ii), d (i) c. a (iii), b(i), c(ii), d (iv) d. a (iv), b(ii), c(i), d (iii)	1	CO1 CO2 CO3 CO4	K1 K2 K3	PO1
x	Which is used to treat benzodiazepine toxicity? a) Ferritin b) Flumazenil c) N-acetylcysteine d) Physostigmine	1	CO5 CO6	K1 K2 K3	PO1
xi	Which of the following antiseptics is a Prodrug a) Codeine b) Methycellulose c) Racecadotril d) Methotrexate	1	CO1 CO2 CO3 CO4	K1 K2	PO1
xii	Antibiotic inhibiting bacterial RNA synthesis is a) Erythromycin b) Rifampin c) Chloramphenicol d) Streptomycin	1	CO1 CO2 CO3 CO4	K1 K2	PO1
xiii	Identify the incorrect pair a) Fluconazole- Triazoles b) Terbinafine- Allylamine c) Voriconazole- Imidazoles d) Nystatin- Antibiotics	1	CO1 CO2 CO3 CO4	K1 K2	PO1
xiv	Prostaglandin analogues used in treatment of ulcer causes a) Diarrhoea b) Uterine bleeding c) Abortion d) All of these	1	CO1 CO2 CO3 CO4	K1 K2 K3	PO1
xv	Flucytosine has supra-additive action with a) Amphotericin B b) Griseofulvin c) Ketoconazole d) Terbinafine	1	CO1 CO2 CO3 CO4	K1 K2	PO1
xvi	Dextromethorphan is used in cough syrup as a) Expectorants b) Pharyngeal demulcent	1	CO1 CO2	K1 K2	PO1

xvii	c) Suppressants d) Mucolytics Sulphonamides are structurally similar to a) Penicillin b) Cephalosporin c) PABA d) DHFA	1	CO1 CO2 CO3 CO4	K1 K2	PO1
xviii	Drug causes leakage from cell membranes a) Amphotericin B b) Rifampin c) Streptomycin d) All	1	CO1 CO2 CO3 CO4	K1 K2	PO1
xix	Antidote for Mercury poisoning a) N-acetylcysteine b) Dimercaprol c) Physostigmine d) None	1	CO5 CO6	K1 K2 K3	PO1
xx	Long term use of Cimetidine at high doses may cause a) Cardiac failure b) Bowel upset c) Gynecomastia d) Parietal cell Blockade	1	CO1 CO2 CO3 CO4	K1 K2	PO1
Section B (Answer any TWO out of THREE) – 20 Marks (Each question Carry 10 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO
2	What is bronchial asthma? Classify anti-asthmatic drugs. Explain the pharmacology of Theophylline.	10	CO1 CO2 CO3 CO4	K1 K2 K3	PO1
3	List antifungal drugs using examples. Discuss in detail the pharmacology of any one drug which belongs to class Polyenes.	10	CO1 CO2 CO3 CO4	K1 K2 K3	PO1
4	Classify Antitubercular drugs. Write in detail the pharmacology of INH(Isoniazid)	10	CO2 CO3 CO4	K1 K2 K3	PO1
Section C (Answer any SEVEN out of NINE) – 35 Marks (Each question Carry 05 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO
5	Classify anti-leprotic drug. Discuss the M.O.A and adverse effects of drug commonly used in treatment of TB and Leprosy.	5	CO1 CO2 CO3 CO4	K1 K2 K3	PO1
6	Classify anti-tussive drugs. State the difference between expectorants and antitussives.	5	CO1 CO2 CO3	K1 K2 K3	PO1
7	Classify antimalarial drugs. Write the M.O.A and adverse effects of Chloroquine.	5	CO2 CO3 CO4	K1 K2 K3	PO1
8	Discuss the Mechanism of organophosphorus poisoning. Write the symptoms and its management.	5	CO5 CO6	K1 K2 K3	PO1
9	Classify sulphonamides with examples. Describe their MOA and uses.	5	CO3	K1 K2	PO1

ARKA JAIN University Jharkhand		NAAC GRADE A ACCREDITED UNIVERSITY	[14-05-2025] END SEM EXAMINATION School of Health & Allied Science
Program	Bachelor of Pharmacy		
Subject Name	Biopharmaceutics and Pharmacokinetics	Session	Even, 2024-25
Semester	VI	Year	May, 2025
• Start writing from 2nd page onwards; don't Write on the 1st Page Backside • Answer all Questions of Section A (Compulsory) • Answer Any Two out of Three of Section B • Answer Any Seven out of Nine of Section C • Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will come under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Papers.</u>			
Time: 3 Hour Max. Marks: 75			
Knowledge Level (KL)	K1 : Remembering		K3 : Applying
	K2 : Understanding		K4 : Analysing
		K5 : Evaluating	
		K6 : Creating	

Section A (Each question Carry 01 Mark from Q1-i to xx) – 20 Marks					
Q. N1	QUESTIONS	Marks	COs	KL	PO
i	Which route of drug administration shows high Bioavailability? a) Oral b) Intravenous c) Rectal d) Topical	1	CO3	K2, K1	PO9
ii	Which method is used to determine AUC ? a) Trapezoidal b) Acute Pharmacological c) Michaelis Menten d) All the above	1	CO2	K2, K1	PO1
iii	The pH partition theory explains the relationship between the two of the following: a) pH and lipophilicity b) pKa and lipophilicity c) pKa and pH of medium d) pKa and salt	1	CO2	K5, K1	PO2
iv	All of the following are directly proportional to the rate of the drug diffusion except- a) Surface area b) Thickness of the membrane c) Partition Coefficient d) Conc. gradient	1	CO4	K5	PO2
v	Which of the following is also known as Active transport ? a) Osmosis b) Downhill transport c) Uphill transport d) All of the above	1	CO2	K2, K1	PO1

CO- Course Outcomes, KL- Knowledge Level, PO – Program Outcome

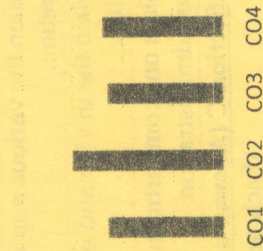
CO1	Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance.
CO2	Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
CO3	Understand the concepts of bioavailability and bioequivalence of drug products and their significance.
CO4	Understand various pharmacokinetic parameters, their significance & applications.

GRAPHICAL REPRESENTATION

Bloom's level wise marks distribution



Course outcomewise marks distribution



vi	The unit of k for Zero order reaction is a) moles/litre/second b) L./second c) moles/second d) second	1	CO4	K1	PO2
vii	Which of the following pharmacokinetic parameter that describe the Urinary Excretion Studies? a) $(dx_u/dt)_{max}$ b) $t_{1/2}$ c) X_u d) All of the above	1	CO2	K1, K3	PO1
viii	As per BCS classification Class II drug has- a) High Solubility, High Permeability b) Low Solubility, Low Permeability c) Low Solubility, High Permeability d) High Solubility, Low Permeability	1	CO1	K1, K4	PO1
ix	Which plasma protein present abundant in blood? a) Albumin b) Globulin c) Fibrinogen d) None	1	CO2	K2, K3	PO1
x	Which equation helps in determining the rate of dissolution of solid in solvent? a) Noyes Whitney b) Fick's first c) Handersen Hasselbalch d) Menten	1	CO2	K2, K4	PO1
xi	β_1 - globulin also called as- a) Transferrin b) Ceruloplasmin c) Transcortin d) None of the above	1	CO4	K1, K2	PO2
xii	Which of the following factors can affect the drug distribution? a) Blood flow b) Protein Binding c) Lipid Solubility c) All of the above	1	CO2	K1, K2	PO1
xiii	Fat is act as reservoir for _____ soluble drugs a) Water b) Lipid c) Ionic d) All	1	CO2	K1, K2	PO2
xiv	Which one of the following has a low perfusion rate? a) Bone b) Muscle c) Kidney d) Liver	1	CO1	K1, K2	PO1
xv	Site IV in HSA is known as a) Warfarin Binding Site b) Diazepam Binding Site c) Digitoxin Binding Site d) Tamoxifen Binding site	1	CO4	K1, K2	PO2
xvi	Plasma protein binding _____ the Vd of drugs a) Increases b) Decreases c) No change d) None	1	CO2	K2, K3	PO2
xvii	When the drug concentration at the site of action reaches or exceeds the MEC, it is called a) Therapeutic range	1	CO3	K2, K3	PO2

xviii	b) Area under curve c) Peak response d) Pharmacological response	1	CO1	K4, K5	PO2
xix	Time to reach the half of the Plasma conc. is a) $t_{1/2}$ b) t_{max} c) total time d) t_{90} The drug bioavailability depends upon a) Drug formulation b) Food Intake c) Route of administration d) All of the above	1	CO3	K4, K5	PO1
xx	Condition where drug concentration in solution is kept high is called a) Sink Condition b) Non Sink condition c) Diffusion d) None	1	CO2	K4, K5	PO1
Section B (Answer any TWO out of THREE) - 20 Marks (Each question Carry 10 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Explain the various non renal route of drug excretion.	10	CO3	K2, K4	PO1
3	Explain the in vivo and in vitro Bioequivalence studies.	10	CO1	K1, K2	PO2
4	Explain one compartment open model with IV bolus administration.	10	CO4	K2, K5	PO1
Section C (Answer any SEVEN out of NINE) - 35 Marks (Each question Carry 05 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO
5	Define Drug distribution. Mention the steps involved in drug distribution.	5	CO1	K2, K4	PO1
6	Shortly write about Volume of Distribution.	5	CO1 CO2	K1, K6	PO2
7	Explain the influence of drug pKa & G.I. pH on drug absorption.	5	CO3	K3, K5	PO1
8	Explain the binding of drugs to human serum albumin.	5	CO4	K1, K6	PO2
9	Explain Ficks laws of diffusion.	5	CO2	K1	PO2
10	Mention the factors affecting renal excretion of drugs.	5	CO2	K3, K6	PO4
11	Explain any one method of assessment of bioavailability.	5	CO3	K1, K3, K4	PO7
12	Shortly write about the various causes of non-linear pharmacokinetics.	5	CO4	K6, K2	PO2
13	Explain various physiological barriers for distribution of drug in body	5	CO2	K1, K3, K4	PO2

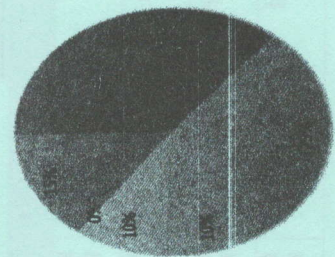
9	Discuss hybridoma technology. Write its production, purification and application	5	K1, K2	CO3	PO2
10	Write note on Storage condition and stability of official vaccines	5	K3, K6	CO5	PO4
11	Explain the microbial production of protease and penicillinase	5	K1, K3, K4	CO3	PO7
12	Discuss Cloning Vectors and its principle with the structure of electorode used in biosensor	5	K6, K2, K3,	CO2	PO2
13	Define Protein engineering and its application	5	K1, K3	CO3	PO2

CO- Course Outcomes, KL- Knowledge Level, PO – Program Outcome

Course Outcomes	CO1	CO2	CO3	CO4	CO5	CO6
	Know current applications of biotechnology in industry and to understand the importance of Immobilized enzymes in Pharmaceutical	Understand the application of genetic engineering in relation to production of pharmaceuticals	Learn types of immunity and general method of the preparation, storage and stability of various official vaccines	Understand various techniques used in modern biotechnology	Demonstrate and provide examples on how to use microbes and mammalian cells for the production of pharmaceutical products	Learn about various blood products/plasma substitutes and their clinical importance

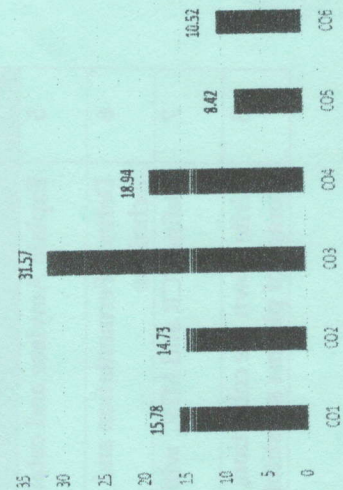
GRAPHICAL REPRESENTATION

Bloom's level wise marks distribution



Course outcome wise marks distribution

distribution



 ARKA JAIN University Jharkhand		 NAAC GRADE A ACCREDITED UNIVERSITY		[16-05-2025] END SEM EXAMINATION School of Health & Allied Sciences.	
Program	Bachelor of Pharmacy				
Subject Name	Pharmaceutical Biotechnology		Session	Even, 2024-2025	
Semester	VI		Year	May, 2025	
Time: 3 Hour Max. Marks : 75 • Start writing from 2nd page onwards; <u>don't Write on the 1st Page.</u> • <u>Backside</u> • Answer all Questions of Section A (Compulsory) • Answer Any <i>Two</i> out of <i>Three</i> of Section B • Answer Any <i>Seven</i> out of <i>Nine</i> of Section C • Possession of Mobile Phones or any kind of <u>Written Material</u>, <u>Arguments with the Invigilator or Discussing with Co-Student</u> will comes under <u>Unfair Means</u> and will <u>Result</u> in the <u>Cancellation of the Papers.</u>					
Knowledge Level (KL)	K1 : Remembering		K3 : Applying		K5 : Evaluating
	K2 : Understanding		K4 : Analysing		K6 : Creating

Section A (Each question Carry 01 Mark from Q1-i to xx) – 20 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	Which is considered as the foremost step in Protein Engineering? a) Insertion of nucleotides b) Gene encoding c) A study of its three-dimensional structure d) Modification in its prosthetic group	1	CO2	K1	PO2
ii	Ligation involves the use of a) Linkers b) Adapters c) Both (a) and (b) d) None of the above	1	CO2	K1	PO1
iii	_____ blotting method is used for DNA a) Western b) Southern c) Northern d) All of the above	1	CO4	K2	PO2
iv	Who invented PCR a) Kary Mullis b) Watson c) E.M.Southern d) Meselson	1	CO4	K1	PO2
v	Immunity acquired from mother to foetus is a) Active immunity b) Passive immunity c) Innate immunity d) All of the above	1	CO3	K2, K1	PO1
vi	ELISA means _____ a) Enzyme linked immunosorbent assay b) Enzyme linked immobilized sorbent	1	CO4	K1	PO2

vii	c) Enzyme loving immunosorbant assay d) None of the above	1	CO5	K1, K3	PO1
viii	_____ is prokaryotic micro-organisms a) Algae b) Fungi c) Virus d) Rickettsiae _____ is the basic function of the fermenter. a) Recovery of product b) Medium Sterilization c) Provision of optimum growth conditions d) None of the above	1	CO5	K1	PO1
ix	Dolly sheep was genetically similar to a) The mother from which nucleated fertilized egg was taken b) The mother from which nuclear DNA of udder cell was taken c) The surrogate mother d) Both surrogate mother and nuclear donor mother	1	CO2	K2	PO1 0
x	In forensic science which of the following is used? a) Bacterial cloning b) DNA foot printing c) DNA fingerprinting d) DNA cloning	1	CO1	K2	PO1
xi	The class of antibodies, which can cross the placenta is a) IgD b) IgA c) IgG d) IgM	1	CO3	K1	PO2
xii	Antibodies are a) Prostaglandins b) Steroids c) lipoprotein d) glycoprotein	1	CO3	K1, K2	PO1
xiii	A positive tuberculin test is an example of * a) Delayed type hypersensitivity b) Acute contact dermatitis c) Type I hypersensitivity d) Eczema	1	CO1	K1, K2	PO2
xiv	Which hypersensitivity reactions are T cell mediated? * a) Type IV b) Type III c) Type I c) Type II	1	CO1	K1, K2	PO1
xv	B cells that produce and release large amounts of antibody are called: a) Memory cells b) Basophils c) Plasma cells d) Killer cells	1	CO3	K1, K2	PO2
xvi	Name the class of immunoglobulin which takes part in hypersensitivity reaction? a) IgG b) IgE c) IgA d) IgM	1	CO3	K2	PO2

xvii	Introduction of recombinant DNA into the bacterial cell by using current is called a) Transformation b) Electroporation c) Transduction d) Transduction	1	CO1	K2	PO2
xviii	Which of the following is the first transgenic crop? a) Flax b) Tobacco c) Plastic d) Cotton	1	CO5	K1	PO2
xix	Chain termination is a type of a) Sequencing b) Vector generation c) Antibiotic production d) Gene manipulation	1	CO2	K1	PO1
xx	Which of the following is the commonly employed adsorbents? a) Calcium carbonate b) Alumina c) Celluloses d) All of these	1	CO1	K1	PO1
Section B (Answer any TWO out of THREE) – 20 Marks (Each question Carry 10 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO
2	What is recombinant DNA technology? Write the various process involve in production of protein through r DNA technology.	10	CO1	K1, K2, K4	PO1
3	Define immunity along with its type and structure of immunoglobulin with its function.	10	CO3	K1, K2, K6	PO2
4	Classify ImmunoBlotting Techniques and explain ELISA with their types and application.	10	CO4	K2, K1	PO1 0
Section C (Answer any SEVEN out of NINE) – 35 Marks (Each question Carry 05 Marks)					
Q. No.	QUESTIONS	Marks	COs	KL	PO
5	Explain Amylase and catalase	5	CO2	K2, K4	PO1
6	Define Fermentation and its sterilization technique	5	CO6	K1, K6	PO2
7	Define PCR and MHC with their principle	5	CO4	K1, K2	PO1
8	Write down the collection, processing and storage of plasma substitutes	5	CO6	K1, K6	PO2