Program: Bachelor of Pharmacy **Duration:** 4 years

COURSE OUTCOMES

I YEAR- I SEM: A.Y- 2020-21.

Upon completion of the course, the student should be able to,			
GLOBAL COLLEGE OF PHARMACY (Approved by PCI, New Delhi & Affiliated to JNTU, Hyderabad) Chilkur (V), Moinabad (M), RR Dist. Hyderabad. Telangana – 501504.			
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Human Anatomy and Physiology I	**COURSE CODE**	C111
COs	**COURSE OUTCOME**		**BTL**
C111.1	What are the main forms of intracellular signaling at the cellular level and how do they differ in their mode of activation and function?		4 ANALYZING
C111.2	What are the key components of the integumentary system, and how do they contribute to the overall structure and functions of the skin, and its role in the human body?		2 UNDERSTANDING
C111.3	How does the intricate organization of the nervous system contribute to the transmission of nerve impulses, and what role do neurotransmitters play in facilitating communication between neurons at the synapse?		4 ANALYZING
C111.4	How do the sympathetic and parasympathetic nervous systems differ in terms of structure and function, and how do they influence bodily responses?		4 ANALYZING
C111.5	What are the key components and functions of the endocrine system and some common disorders associated with its glands?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmaceutical Analysis I	**COURSE CODE**	C112
COs	**COURSE OUTCOME**		**BTL**
C112.1	For pharmaceutical analysis, what are the primary sources of errors, and how can accuracy and precision be improved while considering significant figures?		2 UNDERSTANDING
C112.2	What are the key principles and methods involved in non-aqueous titrations, and how do they differ from traditional acid-base titrations?		2 UNDERSTANDING

C112.3	What are the key principles and methods involved in the estimation of sodium chloride in precipitation titrations?		2 UNDERSTANDING
C112.4	What is the fundamental principle behind redox titrations, and can you provide an example of a specific redox titration and its application?		2 UNDERSTANDING
C112.5	What are the key components and applications of electrochemical methods of analysis, specifically conductometry, potentiometry, and polarography?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmaceutics I	**COURSE CODE**	C113
COs	**COURSE OUTCOME**		**BTL**
C113.1	What is the historical significance of the profession of pharmacy in India, and how has it evolved in terms of education, industry, and organization, as well as its role as a career choice?		2 UNDERSTANDING
C113.2	What are some advantages and disadvantages of liquid dosage forms, and what excipients are commonly used in their formulation to enhance solubility?		2 UNDERSTANDING
C113.3	How are monophasic and biphasic liquid pharmaceutical preparations different, and what are the specific challenges and methods for ensuring stability in suspensions and emulsions?		2 UNDERSTANDING
C113.4	What is the fundamental principle behind redox titrations, and can you provide an example of a specific redox titration and its application?		2 UNDERSTANDING
C113.5	What are the key components and applications of electrochemical methods of analysis, specifically conductometry, potentiometry, and polarography?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmaceutical Inorganic Chemistry I	**COURSE CODE**	C114
COs	**COURSE OUTCOME**		**BTL**
C114.1	What are the sources and types of impurities in pharmaceutical substances, and what are the principles involved in limit tests for Chloride, Sulphate, Iron, Arsenic, Lead, and Heavy metals, including any modified limit tests for Chloride and Sulphate?		2 UNDERSTANDING
C114.2	What is the role of fluoride in the treatment of dental caries, and how do dental products like dentifrices, desensitizing agents, and dental cements, containing ingredients like calcium carbonate, sodium fluoride, and zinc eugenol, contribute to oral health?		2 UNDERSTANDING
C114.3	What are the ideal properties of antacids, and how are different antacids like Sodium Bicarbonate, Aluminum hydroxide gel, and Magnesium hydroxide mixtures used to relieve acidity and indigestion?		3 APPLICATION
C114.4	What are the key do's and don'ts of a successful interview, and how can individuals effectively deal with fears, plan, structure, and deliver presentations to engage their audience?		3 APPLICATION

C114.5	How do effective communication skills play a role in group discussions, and what are some important do's and don'ts to keep in mind when participating in a group discussion?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Communication skills	**COURSE CODE**	C115
COs	**COURSE OUTCOME**		**BTL**
C115.1	What are the key components of the communication process, and how can various barriers and personal perspectives influence effective communication?		2 UNDERSTANDING
C115.2	How do people's communication styles, such as the Direct, Spirited, Systematic, and Considerate styles, affect the way they interact and convey messages, and what role does non-verbal communication play in these interactions?		2 UNDERSTANDING
C115.3	How can self-awareness and active listening skills enhance effective written communication, and what are the key considerations when deciding whether to use written communication for a particular message?		3 APPLICATIONS
C115.4	What are the key do's and don'ts of a successful interview, and how can individuals effectively deal with fears, plan, structure, and deliver presentations to engage their audience?		3 APPLICATION
C115.5	How do effective communication skills play a role in group discussions, and what are some important do's and don'ts to keep in mind when participating in a group discussion?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Remedial Mathematics/Remedial Biology	**COURSE CODE**	C116
COs	**COURSE OUTCOME**		**BTL**
C116.1	How are partial fractions used in fields like chemical kinetics and pharmacokinetics, and what are the key properties and applications of logarithms in solving pharmaceutical problems?		3 APPLICATION
C116.2	What are the fundamental principles and applications of differentiation in calculus?		2 UNDERSTANDING
C116.3	What are the key concepts and applications of matrices and determinants in mathematics?		2 UNDERSTANDING
C116.4	What are the fundamental principles and key applications of analytical geometry and integration in calculus?		2 UNDERSTANDING
C116.5	How do differential equations and Laplace transforms contribute to the understanding and solution of complex mathematical models, such as those in pharmacokinetics and chemical kinetics?		3 APPLICATION
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Human Anatomy and Physiology-I lab	**COURSE CODE**	C117
COs	**COURSE OUTCOME**		**BTL**
C117.1	What are the key components of a compound microscope?		1 REMEMBERING

C117.2	What are the key differences in the microscopic characteristics of epithelial and connective tissues?		2 UNDERSTANDING
C117.3	What are the key differences in the microscopic structure of muscular and nervous tissue?		2 UNDERSTANDING
C117.4	What are the axial bones in the human body?		1 REMEMBERING
C117.5	What methods are employed to study the integumentary and special senses using specimens and models?		3 APPLICATION
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmaceutical Analysis-I lab	**COURSE CODE**	C118
COs	**COURSE OUTCOME**		**BTL**
C118.1	How is the preparation and standardization of potassium permanganate, sodium hydroxide, sulphuric acid, sodium thiosulfate.		3. Apply
C118.2	How is sodium hydroxide standardized using a primary standard?		3. Apply
C118.3	What is the significance of using ceric ammonium sulphate in titration procedures, and how is it standardized?		2. Understand
C118.4	What is the titration method and standardization procedure for the assay of Ammonium chloride?		3. Apply
C118.5	What are the key considerations in determining the normality by electro-analytical methods in conductometric and potentiometric titrations?		4. Analyse
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmaceutics lab	**COURSE CODE**	C119
COs	**COURSE OUTCOME**		**BTL**
C119.1	What are the recommended dosing instructions for Paracetamol pediatric syrup?		1 REMEMBERING
C119.2	What are the recommended dosages for Piperazine citrate elixir and Paracetamol pediatric elixir?		1 REMEMBERING
C119.3	What are the key ingredients of the Simple Linctus BPC?		1 REMEMBERING
C119.4	What are the properties and applications of a strong solution of ammonium acetate, and how does cresol interact with soap solution?		2 UNDERSTANDING
C119.5	What are the common medical uses for suspensions containing calamine lotion and magnesium hydroxide mixture?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmaceutical Inorganic Chemistry lab	**COURSE CODE**	C1110
COs	**COURSE OUTCOME**		**BTL**
C1110.1	What is the purpose of the limit test for Chlorides and Sulphates, and how does it differ from the modified limit test for Chlorides and Sulphates and the limit test for Iron?		4 ANALYZING

C1110.2	What is the chemical formula for each of the following substances: Magnesium hydroxide, Ferrous sulfate, Sodium bicarbonate, Calcium gluconate, and Copper sulfate?		1 REMEMBERING
C1110.3	What is the test for purity of the swelling power of Bentonite?		2 UNDERSTANDING
C1110.4	How can potassium iodate and iodine be quantitatively determined in a sample of potassium iodide?		3 APPLY
C1110.5	What are the key steps involved in the preparation of inorganic pharmaceuticals such as boric acid, potash alum, and ferrous sulfate?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Communication skills lab	**COURSE CODE**	C1111
COs	**COURSE OUTCOME**		**BTL**
C1111.1	What are some key phrases to use when meeting new people to make a positive first impression?		3. Apply
C1111.2	How can you effectively use consonant and vowel sounds to improve your pronunciation and clarity in speech?		3. Apply
C1111.3	What are important do's and don'ts to remember when making friends in a new social setting?		2. Understand
C1111.4	How can you improve your listening comprehension skills to better understand direct and indirect speech in conversations?		3. Apply
C1111.5	What are some essential e-mail etiquette rules to follow for professional communication?		4. Analyse

I YEAR- II SEM: A.Y- 2020-21.

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PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, II SEM	**REGULATION**	R17
COURSE	Human Anatomy and Physiology II	**COURSE CODE**	C121
COs	**COURSE OUTCOME**		**BTL**
C121.1	What are the key roles of the lymphatic system in the human body and how does it interact with the circulatory system, particularly in relation to the transportation of body fluids and immune function?		2 UNDERSTANDING
C121.2	What are the key components and regulatory mechanisms of the cardiovascular system, and how do they contribute to maintaining heart function and blood circulation?		2 UNDERSTANDING
C121.3	What are the key anatomical features and functions of the stomach, small intestine, and large intestine, along with their respective roles in the digestive process, including the regulation of acid production in the stomach, the role of pepsin in protein digestion, and the digestion and absorption of nutrients?		2 UNDERSTANDING
C121.4	What are the key components of the respiratory system, and how do the lungs function in the process of respiration, including the regulation of breathing, lung volumes and capacities, and the transport of respiratory gases?		2 UNDERSTANDING
C121.5	What is the role of sex hormones in the male and female reproductive systems and how do they impact the processes of fertilization and pregnancy in the context of genetics?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, II SEM	**REGULATION**	R17
COURSE	Pharmaceutical Organic Chemistry I	**COURSE CODE**	C122
COs	**COURSE OUTCOME**		**BTL**
C122.1	What are the key principles of classifying, naming, and distinguishing structural isomers in organic compounds?		2 UNDERSTANDING
C122.2	What are the key concepts and reactions associated with alkanes, alkenes, and conjugated dienes?		1 REMEMBERING
C122.3	What are the key factors that influence the choice between SN1 and SN2 reactions in alkyl halides, and how do these reactions differ in terms of kinetics and stereochemistry?		2 UNDERSTANDING

C122.4	What are the qualitative tests for different alcohols, and what are the structures and common uses of ethyl alcohol, chlorobutanol, cetostearyl alcohol, benzyl alcohol, glycerol, and propylene glycol?		2 UNDERSTANDING
C122.5	What are the key reactions and uses associated with carbonyl compounds, particularly aldehydes and ketones?		1 REMEMBERING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, II SEM	**REGULATION**	R17
COURSE	Biochemistry	**COURSE CODE**	C123
COs	**COURSE OUTCOME**		**BTL**
C123.1	What is the significance of the HMP shunt in carbohydrate metabolism and how is it related to Glucose-6-Phosphate dehydrogenase (G6PD) deficiency?		2 UNDERSTANDING
C123.2	What are the key steps in the catabolism of heme, and how do hyperbilirubinemia and jaundice relate to this process?		2 UNDERSTANDING
C123.3	What role do purine and pyrimidine nucleotides play in the transfer of genetic information, and how does their metabolism impact the development of hyperuricemia and Gout disease?		2 UNDERSTANDING
C123.4	What are the primary biomolecules and their respective roles in biological systems, and how does the concept of free energy relate to the biological significance of energy-rich compounds like ATP and cyclic AMP?		1 REMEMBERING
C123.5	What are the key mechanisms and applications of enzymes, and how do factors like enzyme kinetics, inhibition, and regulation contribute to their therapeutic and diagnostic roles?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, II SEM	**REGULATION**	R17
COURSE	Pathophysiology	**COURSE CODE**	C124
COs	**COURSE OUTCOME**		**BTL**
C124.1	What are the fundamental principles underlying cell injury, adaptation, and the mechanisms involved in inflammation and repair?		2 UNDERSTANDING
C124.2	How do chronic renal failure, congestive heart failure, and chronic obstructive airways disease collectively impact the body's physiological balance?		2 UNDERSTANDING
C124.3	What are the most effective treatment strategies for managing the symptoms and complications of sickle cell anemia, particularly focusing on pain management and preventing vaso-occlusive crises?		3 APPLY
C124.4	What are the common risk factors for the development of inflammatory bowel diseases, jaundice, and various types of hepatitis?		1 REMEMBERING
C124.5	What are common methods of transmission for each of these diseases?		1 REMEMBERING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, II SEM	**REGULATION**	R17
COURSE	Computer Applications in Pharmacy	**COURSE CODE**	C125
COs	**COURSE OUTCOME**		**BTL**

C125.1	How do binary addition and binary subtraction using the one's complement and two's complement methods relate to the concept of information gathering and project planning in information systems and software development?		3 APPLY
C125.2	What are the key components and technologies involved in web development, including HTML, XML, CSS, programming languages, web servers, and databases like MySQL, MS Access, and their applications in a Pharmacy Drug database?		1 REMEMBERING
C125.3	How do computers enhance patient adherence monitoring in pharmacy, including their role in diagnostic systems, lab-diagnostic systems, patient monitoring systems, and pharmaceutical information systems?		2 UNDERSTANDING
C125.4	How does bioinformatics contribute to vaccine discovery?		2 UNDERSTANDING
C125.5	How do computers enhance efficiency and accuracy in preclinical development through the integration of Chromatographic Data Analysis (CDS), Laboratory Information Management Systems (LIMS), and Text Information Management Systems (TIMS)?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, II SEM	**REGULATION**	R17
COURSE	Human Anatomy and Physiology II lab	**COURSE CODE**	C126
COs	**COURSE OUTCOME**		**BTL**
C126.1	What is the significance of enumerating white blood cell (WBC) count in a blood test, total red blood corpuscles (RBC) count		2 UNDERSTANDING
C126.2	What are the key parameters measured in a comprehensive medical examination, including bleeding time, clotting time, blood group, heart rate, pulse rate, tidal volume, and vital capacity?"		1 REMEMBERING
C126.3	What are the key advantages of using models, charts, and specimens in the study of the digestive, respiratory, cardiovascular, urinary, and reproductive systems?"		2 UNDERSTANDING
C126.4	What factors influence the accurate recording of blood pressure and basal mass index?		1 REMEMBERING
C126.5	What are the key parameters measured during a total blood count using a cell analyzer?		1 REMEMBERING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, II SEM	**REGULATION**	R17
COURSE	Pharmaceutical Organic Chemistry I lab	**COURSE CODE**	C127
COs	**COURSE OUTCOME**		**BTL**
C127.1	What are the preliminary characteristics used to assess a compound's color, odor, aliphatic/aromatic nature, and saturation/unsaturation during a basic chemical test?		1 REMEMBERING
C127.2	How does Lassaigne's test facilitate the detection of elements such as Nitrogen, Sulphur, and Halogens in a given compound?		2 UNDERSTANDING
C127.3	What are the key functional groups present in the given organic compound, and how might they affect its physical properties, such as melting point and boiling point?		2 UNDERSTANDING

C127.4	What is the established method for identifying unknown compounds based on their melting point or boiling point as documented in the literature?		1 REMEMBERING
C127.5	What are the key steps in confirming the identity of an unknown compound through the preparation of derivatives and analysis of its melting point or boiling point?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, II SEM	**REGULATION**	R17
COURSE	Biochemistry lab	**COURSE CODE**	C128
COs	**COURSE OUTCOME**		**BTL**
C128.1	What distinguishing qualitative tests can differentiate between glucose, fructose, lactose, maltose, sucrose, and starch in carbohydrate analysis?		1 REMEMBERING
C128.2	What are the key steps involved in the qualitative analysis of urine for abnormal constituents?		2 UNDERSTANDING
C128.3	What are the current levels for: Blood creatinine? Blood sugar? Serum total cholesterol?		1 REMEMBERING
C128.4	How do you prepare a buffer solution and measure its pH?		3 APPLY
C128.5	How does temperature impact the enzymatic hydrolysis of starch in the context of salivary amylase activity?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, II SEM	**REGULATION**	R17
COURSE	Computer Applications in Pharmacy lab	**COURSE CODE**	C129
COs	**COURSE OUTCOME**		**BTL**
C129.1	What specific symptoms and medical history should be included in the questionnaire to effectively gather information about the identified disease, and how can an MS Access form be designed to seamlessly manage patient records related to this disease?		3 APPLY
C129.2	How can I create an HTML web page for personal information display and set up a database in MS Access to store patient information with necessary fields?		3 APPLY
C129.3	How can users effectively manage patient records in the MS Access database through a user-friendly form?		3 APPLY
C129.4	How can MS Access facilitate the efficient generation, storage, and retrieval of patient and drug information for report generation and printing?		3 APPLY
C129.5	How can database elements be efficiently transformed into web-compatible formats?		3 APPLY

II YEAR- I SEM: A.Y- 2020-21.

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PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmaceutical Organic Chemistry- II	**COURSE CODE**	C211
COs	**COURSE OUTCOME**		**BTL**
C211.1	What is the orbital picture and evidence supporting the resonance and aromatic character of benzene, and how does Huckel's rule apply to its structure?		2 UNDERSTANDING
C211.2	What are the key factors influencing the acidity of phenols and the basicity of aromatic amines, and how do substituents affect these properties? How are aryl diazonium salts synthetically utilized in chemical processes?		2 UNDERSTANDING
C211.3	What are the key reactions and analytical constants associated with fatty acids, and what are the principles underlying their determination?		2 UNDERSTANDING
C211.4	What are the key reactions and synthesis methods for Naphthalene, Phenanthrene, Anthracene, Diphenylmethane, Triphenylmethane, and their derivatives, and what are their medicinal uses?		2 UNDERSTANDING
C211.5	What are the key principles and limitations of Baeyer's strain theory, and how do Coulson and Moffitt's modification and Sachse-Mohr's theory provide insights into the stabilities of cyclopropane and cyclobutane?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, I SEM	**REGULATION**	R17
COURSE	Physical Pharmaceutics-I	**COURSE CODE**	C212
COs	**COURSE OUTCOME**		**BTL**
C212.1	What are the physicochemical properties of drug molecules and their relevance in pharmaceutical science?		2 UNDERSTANDING
C212.2	What are the key physicochemical properties of drug molecules and how do they impact their determinations and applications in pharmaceutical science?		2 UNDERSTANDING
C212.3	What are the key factors and techniques involved in characterizing the physical properties of powders, including particle size, shape, surface area, and flow properties?		2 UNDERSTANDING

C212.4	What are the key methods for determining particle size and distribution in micromeritics?		2 UNDERSTANDING
C212.5	How do buffers play a crucial role in maintaining isotonicity and pH stability in pharmaceutical and biological systems?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmaceutical Microbiology	**COURSE CODE**	C213
COs	**COURSE OUTCOME**		**BTL**
C213.1	What are the key aspects of microbiology, and how do prokaryotes and eukaryotes differ in terms of their ultra-structure and growth requirements?		2 UNDERSTANDING
C213.2	How are bacteria identified through staining techniques and biochemical tests, and what are the key principles, procedures, advantages, disadvantages, and real-world applications of different sterilization methods?		2 UNDERSTANDING
C213.3	What are the key aspects of studying fungi, viruses, disinfectants, and sterility testing in pharmaceutical and microbiological fields?		2 UNDERSTANDING
C213.4	What are the key principles for preventing contamination in an aseptic area and ensuring environmental cleanliness during the design and operation of laminar flow equipment?		2 UNDERSTANDING
C213.5	What are the key considerations for microbial contamination and spoilage in pharmaceutical products, and how can antimicrobial agents be used to preserve them?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmaceutical Engineering	**COURSE CODE**	C214
COs	**COURSE OUTCOME**		**BTL**
C214.1	What are the fundamental principles and applications of Bernoulli's theorem in fluid dynamics?		2 UNDERSTANDING
C214.2	What are the primary objectives and key differences between Crystallization and Evaporation processes, and what are the main factors influencing each process?		2 UNDERSTANDING
C214.3	What are the key principles, mechanisms, and applications of various drying techniques, and how do different types of distillation processes work, considering their uses and limitations in different scales?		2 UNDERSTANDING
C214.4	Could you elaborate on which part of the topic you would like me to generate a single short question for?		2 UNDERSTANDING
C214.5	Filtration: What are the key factors influencing the efficiency of filtration processes and how do filter aids and media impact the overall filtration performance?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmaceutical Organic Chemistry-I I lab	**COURSE CODE**	C215
COs	**COURSE OUTCOME**		**BTL**
C215.1	What are the primary techniques used in laboratory experiments for recrystallization and steam distillation?		2 UNDERSTANDING

C215.2	What are the methods for determining the acid value, saponification value, and iodine value of oils, including the standardization of reagents?		2 UNDERSTANDING
C215.3	What are the key synthetic pathways for the preparation of the following compounds: Benzanilide, 2,4,6-Tribromo aniline, 5-Nitro salicylic acid, and Benzoic acid?		1 REMEMBER
C215.4	What are the key synthetic pathways for the preparation of the following compounds: Benzanilide, 2,4,6-Tribromo aniline, 5-Nitro salicylic acid, and Benzoic acid?		1 REMEMBER
C215.5	How can Dibenzal acetone be synthesized from Benzaldehyde using the Claisen-Schmidt reaction?		3 APPLY
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, I SEM	**REGULATION**	R17
COURSE	Physical Pharmaceutics-I Lab	**COURSE CODE**	C216
COs	**COURSE OUTCOME**		**BTL**
C216.1	What methods can be used to determine the solubility of a drug at room temperature under various pH conditions?		3. Apply
C216.2	What is the procedure for determining the partition coefficient of iodine in CCl4 and water?		3. Apply
C216.3	How can microscopic methods be used to determine particle size and particle size distribution?		3. Apply
C216.4	How is the solubility of a drug determined at room temperature under different pH conditions?		3. Apply
C216.5	What are the steps involved in determining the stability constant and donor-acceptor ratio of a PABA-Caffeine complex by the solubility method?		3. Apply
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmaceutical Microbiology Lab	**COURSE CODE**	C217
COs	**COURSE OUTCOME**		**BTL**
C217.1	What are the key equipment and processes involved in experimental microbiology, including sterilization of glassware and media preparation?		1 REMEMBER
C217.2	What are the key techniques and procedures involved in sub-culturing bacteria and fungi, as well as in preparing nutrient stabs and slants, and how do staining methods such as Simple, Gram's staining, and acid-fast staining play a role in practical demonstrations?		3 APPLY
C217.3	How can pure cultures of microorganisms be isolated using the multiple streak plate technique and other methods?		3 APPLY
C217.4	What methods are commonly used for sterility testing of pharmaceuticals and bacteriological analysis of water in the pharmaceutical industry?		1 REMEMBER
C217.5	What are the key IMViC reactions and their significance in biochemical testing?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, I SEM	**REGULATION**	R17

COURSE	Pharmaceutical Engineering Lab	COURSE CODE	C218
COs	**COURSE OUTCOME**		**BTL**
C218.1	What methods are used to determine the radiation constant of brass, iron, unpainted glass, and painted glass, and how is the efficiency of steam distillation calculated?		1 REMEMBER
C218.2	How can we calculate the overall heat transfer coefficient in a heat exchanger?		3 APPLY
C218.3	How is the moisture content determined using the dew point method, and what are its applications in pharmaceutical machinery like rotary tablet machines and fluidized bed coaters?		2 UNDERSTANDING
C218.4	What are the key objectives and experiments involved in size analysis by sieving and size reduction using a ball mill in pharmaceutical manufacturing?		2 UNDERSTANDING
C218.5	What are the key factors influencing the rate of filtration and evaporation in various major equipment like colloid mills, planetary mixers, fluidized bed dryers, and freeze dryers?		4 ANALYZE

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PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, II SEM	**REGULATION**	R17
COURSE	Pharmaceutical Organic Chemistry-III	**COURSE CODE**	C221
COs	**COURSE OUTCOME**		**BTL**
C221.1	What distinguishes stereo isomerism, and what are its different forms?		2 UNDERSTANDING
C221.2	What are the distinguishing features of geometrical isomerism and how is it different from conformational isomerism?		2 UNDERSTANDING
C221.3	What are the key differences in the nomenclature, synthesis, reactions, and medicinal applications of pyrrole, furan, and thiophene, particularly focusing on their relative aromaticity, reactivity, and the basicity of pyrrole?		4 ANALYZE
C221.4	What are the medicinal uses and synthesis methods for pyridine, quinoline, isoquinoline, acridine, and indole, and what is the basicity of pyridine?		4 ANALYZE
C221.5	What are the key differences in the mechanisms of metal hydride reduction, Clemmensen reduction, Birch reduction, Wolff-Kishner reduction, Oppenauer oxidation, and Dakin reaction?		4 ANALYZE
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, II SEM	**REGULATION**	R17
COURSE	Medicinal Chemistry-I	**COURSE CODE**	C222
COs	**COURSE OUTCOME**		**BTL**
C222.1	What are the key historical milestones in the development of medicinal chemistry, and how do physicochemical properties influence the biological action of drugs, particularly in terms of ionization, solubility, and drug metabolism principles?		5 EVALUATE
C222.2	What are the key differences in the biosynthesis and catabolism of catecholamines? Additionally, how do the distribution and functions of alpha- and beta-adrenergic receptors vary within the body?		4 ANALYZE
C222.3	What are the biosynthesis and catabolism processes of acetylcholine, and how do they relate to the functioning of cholinergic receptors such as Muscarinic and Nicotinic receptors, and the distribution of parasympathomimetic agents?		4 ANALYZE
C222.4	What are the structural characteristics and pharmacological actions of Benzodiazepines, Barbiturates, and Anticonvulsants?		2 UNDERSTANDING

C222.5	What are the various classes of drugs acting on the Central Nervous System and their specific subtypes and examples within those classes?		1 REMEMBERING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, II SEM	**REGULATION**	R17
COURSE	Physical Pharmaceutics-II	**COURSE CODE**	C223
COs	**COURSE OUTCOME**		**BTL**
C223.1	What are the key factors influencing the chemical degradation of pharmaceutical products, and how can medicinal agents be stabilized against common reactions like hydrolysis and oxidation?		5 EVALUATE
C223.2	How do rheological properties influence the deformation behavior of solids in the context of the Heckel equation and elastic modulus?		4 ANALYZE
C223.3	What are the key factors influencing the physical stability and formulation of coarse dispersions, including suspensions and emulsions, and how do these systems behave under different interfacial and rheological conditions?		5 EVALUATE
C223.4	How do surface active agents impact the spreading coefficient and adsorption at liquid and solid interfaces?		4 ANALYZE
C223.5	What are the general characteristics and properties of colloidal dispersions, and how do they vary in terms of size, shape, and classification of colloidal particles?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, II SEM	**REGULATION**	R17
COURSE	Pharmacology-I	**COURSE CODE**	C224
COs	**COURSE OUTCOME**		**BTL**
C224.1	What is the significance of spare receptors in the context of pharmacology and drug action?		2 UNDERSTANDING
C224.2	What are the key principles of pharmacodynamics and how do receptors, drug interactions, and signal transduction mechani sms play a role in drug action?		2 UNDERSTANDING
C224.3	What are the key neurotransmitter categories involved in the autonomic nervous system, and how do sympathomimetics and sympatholytics affect it?		2 UNDERSTANDING
C224.4	What are the key neurotransmitters involved in neurohumoral transmission in the central nervous system, and how do they influence its pharmacology?		2 UNDERSTANDING
C224.5	What are the key topics covered in the 7-hour pharmacology of the central nervous system course?		1 REMEMBERING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, II SEM	**REGULATION**	R17
COURSE	Pharmacognosy and Phytochemistry-I	**COURSE CODE**	C225
COs	**COURSE OUTCOME**		**BTL**
C225.1	What are the key mechanisms of action for opioid analgesics and antagonists in the central nervous system?		2 UNDERSTANDING
C225.2	What are the key categories of drugs that affect the central nervous system?		1 REMEMBERING

C225.3	How has plant tissue culture contributed to the development of edible vaccines in pharmacognosy?		5 EVALUATE
C225.4	How does Pharmacognosy contribute to both allopathy and traditional systems of medicine like Ayurveda, Unani, Siddha, Homeopathy, and Chinese medicine?		5 EVALUATE
C225.5	What are the therapeutic uses and commercial utilities of marine drugs derived from natural sources, and how do they differ from the primary metabolites found in carbohydrates, proteins, and lipids in pharmaceutical applications?		5 EVALUATE
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, II SEM	**REGULATION**	R17
COURSE	Medicinal Chemistry-I Lab	**COURSE CODE**	C226
COs	**COURSE OUTCOME**		**BTL**
C226.1	How are 1,3-pyrazole, 1,3-oxazole, and benzimidazole intermediates prepared for drug synthesis?		3 APPLY
C226.2	How is Benzocaine synthesized?		3 APPLY
C226.3	How are Phenytoin, Phenothiazine, and Barbiturate drugs prepared?		3 APPLY
C226.4	What are the assay methods for Chlorpromazine, Phenobarbitone, and Atropine?		1 REMEMBERING
C226.5	What are the common assay methods for Ibuprofen, Aspirin, and Furosemide?		1 REMEMBERING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, II SEM	**REGULATION**	R17
COURSE	Physical Pharmaceutics-II Lab	**COURSE CODE**	C227
COs	**COURSE OUTCOME**		**BTL**
C227.1	How can the surface tension of a given liquid be accurately determined using the drop count or drop weight method?		3 APPLY
C227.2	How does the viscosity of a liquid change when measured using Ostwald's viscometer?		2 UNDERSTANDING
C227.3	What are the key steps involved in determining the viscosity of a semisolid using a Brookfield viscometer?		3 APPLY
C227.4	How is the reaction rate constant determined for a first-order reaction?		2 UNDERSTANDING
C227.5	What are the key degradation pathways observed during accelerated stability studies?		4 ANALYZE
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	II YEAR, II SEM	**REGULATION**	R17
COURSE	Pharmacology-I Lab	**COURSE CODE**	C228
COs	**COURSE OUTCOME**		**BTL**
C228.1	What are the guidelines set by CPCSEA for the maintenance of laboratory animals?		1. Remember
C228.2	How is the effect of hepatic microsomal enzyme inducers on phenobarbitone sleeping time in mice studied?		3. Apply
C228.3	Describe the procedure for administering drugs via different routes in mice or rats.		2. Understand

C228.4	What are the steps involved in measuring the anticonvulsant effects of drugs using the MES and PTZ methods?		3. Apply
C228.5	How is the locomotor activity of animals assessed using an actophotometer?		3. Apply
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	I YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmacognosy and Phytochemistry-I Lab	**COURSE CODE**	C229
COs	**COURSE OUTCOME**		**BTL**
C229.1	How do the chemical tests for Tragacanth, Acacia, Agar, Gelatin, Starch, Honey, and Castor oil differ in the analysis of crude drugs?		4 ANALYZE
C229.2	What are the methods for determining the size of starch grains, calcium oxalate crystals using an eyepiece micrometer, and the fiber length and width?		3 APPLY
C229.3	How is the determination of the number of starch grains achieved using the Lycopodium spore method?		3 APPLY
C229.4	What are the standard methods for determining the moisture content of crude drugs?		1 REMEMBERING
C229.5	What methods are commonly used to determine the swelling index and foaming properties of materials?		1 REMEMBERING

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PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, I SEM	**REGULATION**	R17
COURSE	Medicinal Chemistry-II	**COURSE CODE**	C311
COs	**COURSE OUTCOME**		**BTL**
C311.1	What are the main types of histamine receptors in the human body and which antihistaminic agents target H1 receptors?		1 REMEMBERING
C311.2	What anti-anginal medication belongs to the class of Vasodilators in the given list?		2 UNDERSTANDING
C311.3	What are the mechanisms of action of Warfarin and Clopidogrel in coagulation regulation and anticoagulation?		2 UNDERSTANDING
C311.4	What are the different categories of drugs that act on the endocrine system, and can you provide examples of drugs within each category?		1 REMEMBERING
C311.5	What are common classes of antidiabetic agents and their representative drugs?		1 REMEMBERING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, I SEM	**REGULATION**	R17
COURSE	Industrial Pharmacy - I	**COURSE CODE**	C312
COs	**COURSE OUTCOME**		**BTL**
C312.1	What are the key objectives of preformulating studies, and how do the physicochemical characteristics of drug substances, impact the development and stability of various dosage forms?		2 UNDERSTANDING
C312.2	What are the important quality control tests for both in-process and finished products in tablet manufacturing, and how do these tests ensure the quality and safety of pharmaceutical tablets?		5 EVALUATE
C312.3	What are the key steps involved in the production of hard gelatin capsules, including the extraction of gelatin, capsule shell production, capsule sizes, filling techniques, finishing processes, and special formulation techniques?		2 UNDERSTANDING
C312.4	What are the different types of drugs that act on the endocrine system, and what are their specific roles or mechanisms of action?		2 UNDERSTANDING
C312.5	What are the key considerations in formulating and preparing various cosmetic products like lipsticks, shampoos, cold cream, vanishing cream, toothpaste, hair dyes, and sunscreens, and how do pharmaceutical aerosols and packaging materials differ in terms of definition, components, and quality control?		4 ANALYZE
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.

YEAR/ SEM:	III YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmacology II	**COURSE CODE**	C313
COs	**COURSE OUTCOME**		**BTL**
C313.1	What are the key principles of the pharmacology of drugs acting on the cardiovascular system, encompassing hemodynamics, electrophysiology of the heart, congestive heart failure, antihypertensive, anti-anginal, antiarrhythmic, and anti-hyperlipidemic drugs?		2 UNDERSTANDING
C313.2	What is the pharmacology of the cardiovascular system, urinary system, what is the main function of anti-diuretics?		2 UNDERSTANDING
C313.3	What is the primary function of autacoids, and how are they classified? What are the roles of prostaglandins, thromboxane's, and leukotrienes, and how do they differ in their functions?		2 UNDERSTANDING
C313.4	What are the basic concepts in endocrine pharmacology related to anterior pituitary hormones, thyroid hormones, hormones regulating plasma calcium levels, insulin, oral hypoglycemic agents, glucagon, ACTH, and corticosteroids, focusing on analogues and inhibitors?		2 UNDERSTANDING
C313.5	What are the pharmacological effects of androgens and anabolic steroids on the endocrine system?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmacognosy and Phytochemistry - II	**COURSE CODE**	C314
COs	**COURSE OUTCOME**		**BTL**
C314.1	How do metabolic pathways in higher plants, such as the Shikimic acid, Acetate, and Amino acid pathways, contribute to the formation of secondary metabolites, and what role do radioactive isotopes play in biogenetic studies in this context?"		4 ANALYZE
C314.2	What are the general methods of extraction and analysis for the secondary metabolite group that includes alkaloids from Vinca, Rauwolfia, Belladonna, and Opium?		2 UNDERSTANDING
C314.3	What are the therapeutic properties of tannins, resins, glycosides, and iridoids in various botanical sources like Catechu, Benzoin, Senna, and Gentian?		2 UNDERSTANDING
C314.4	What methods are commonly used for the isolation, identification, and analysis of phytoconstituents like terpenoids, glycosides, alkaloids, and resins in plant extracts?		3 APPLY
C314.5	What modern extraction methods are employed for the industrial production and estimation of phytoconstituents like Forskolin, Sennoside, Artemisinin, Diosgenin, Digoxin, Atropine, Podophyllotoxin, Caffeine, Taxol, Vincristine, and Vinblastine?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, I SEM	**REGULATION**	R17
COURSE	Cosmetic Science (Elective)	**COURSE CODE**	C318
COs	**COURSE OUTCOME**		**BTL**

C318.1	What are the key factors to consider when classifying cosmetic and cosmeceutical products based on their excipients and their application to skin, hair, and oral cavity health?		4 ANALYZE
C318.2	What are the key principles and components involved in formulating skin care products?.		3 APPLY
C318.3	What are the key principles and building blocks in formulating skin care products like face wash, moisturizing cream, cold cream, and vanishing cream,		3 APPLY
C318.4	What are the key regulatory definitions of cosmetics in India and the EU, and how have cosmeceuticals evolved from traditional cosmetics, considering their classification as quasi and OTC drugs in the cosmetics industry?		4 ANALYZE
C318.5	What are the key factors to consider when choosing a sunscreen, and how is SPF determined?		3 APPLY
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, I SEM	**REGULATION**	R17
COURSE	Industrial Pharmacy lab	**COURSE CODE**	C319
COs	**COURSE OUTCOME**		**BTL**
C319.1	What key characteristics and properties should be evaluated in a preformulating study for prepared granules?		3 APPLY
C319.2	How are Paracetamol tablets prepared and evaluated?		3 APPLY
C319.3	How are Aspirin tablets prepared and evaluated?		3 APPLY
C319.4	What are the common methods for coating tablets?		1 REMEMBERING
C319.5	How are Tetracycline capsules prepared and evaluated for quality assurance?		3 APPLY
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmacology - II lab	**COURSE CODE**	C3110
COs	**COURSE OUTCOME**		**BTL**
C3110.1	What is the role of in-vitro pharmacology and how are physiological salt solutions used in this field.?		2 UNDERSTANDING
C3110.2	What is the effect of drugs on an isolated frog heart, and how is this experimental setup used in pharmacological research?		3 APPLY
C3110.3	How do drugs affect the blood pressure and heart rate of dogs?		3 APPLY
C3110.4	What are the key findings from the study on diuretic activity of drugs in rats or mice?		2 UNDERSTANDING
C3110.5	What is the primary mechanism of action for the DRC (dose-response curve) of acetylcholine in the frog rectus abdominis muscle?		3 APPLY
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmacognosy and Phytochemistry - II lab	**COURSE CODE**	C3111
COs	**COURSE OUTCOME**		**BTL**

C3111.1	What are the key morphological and histological characteristics of Cinchona, Cinnamon, Senna, Clove, Ephedra, Fennel, and Coriander, and how is the extraction and detection of their active compounds performed?	2 UNDERSTANDING
C3111.2	What methods or techniques are commonly employed for the isolation and detection of atropine from Belladonna and sennosides from Senna plants?	2 UNDERSTANDING
C3111.3	What factors influence the separation of sugars in paper chromatography?	3 APPLY
C3111.4	How is thin-layer chromatography (TLC) used to analyze a herbal extract?	3 APPLY
C3111.5	How can distillation be employed to extract volatile oils, and how are the phytoconstituents detected using TLC in this process?	3 APPLY

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PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, II SEM	**REGULATION**	R17
COURSE	Medicinal Chemistry-III	**COURSE CODE**	C321
COs	**COURSE OUTCOME**		**BTL**
C321.1	What is the historical significance of Beta-Lactam antibiotics, Aminoglycosides, and Tetracyclines?		5 EVALUATE
C321.2	What is the historical background of the development and use of Macrolide antibiotics such as Erythromycin, Clarithromycin, and Azithromycin?		5 EVALUATE
C321.3	What is the structure-activity relationship (SAR) of quinolone antibiotics, focusing on key examples like Nalidixic Acid, Ciprofloxacin, and Ofloxacin?		4 ANALYZE
C321.4	What is the mechanism of action for Amphotericin-B, a commonly used antifungal antibiotic?		3 APPLY
C321.5	What are the key methods and physicochemical parameters employed in drug design, and how do they contribute to the development of effective pharmaceuticals?		5 EVALUATE
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, II SEM	**REGULATION**	R17
COURSE	Pharmacology - III	**COURSE CODE**	C322
COs	**COURSE OUTCOME**		**BTL**
C322.1	What are the key respiratory stimulants, and in what medical situations are they commonly used to enhance respiratory function? What are the key mechanisms of action for emetics and anti-emetics in the context of managing nausea and vomiting?		5 EVALUTE
C322.2	What are the key classes of antibiotics and their mechanisms of action and general principles of chemotherapy?		3 APPLY
C322.3	What is the main target of action for anthelmintics in the treatment of parasitic worm infections? What is the role of antimalarial drugs in preventing and treating malaria?		5 EVALUTE
C322.4	What are the key differences in the pharmacological treatment of urinary tract infections and sexually transmitted diseases, and how does chemotherapy of malignancy relate to immunopharmacology?		4 ANALYZE
C322.5	Can you provide a brief explanation of genotoxicity, carcinogenicity, teratogenicity, and mutagenicity, along with their fundamental concepts?		3 APPLY
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.

YEAR/ SEM:	III YEAR, II SEM	**REGULATION**	R17
COURSE	Herbal Drug Technology	**COURSE CODE**	C323
COs	**COURSE OUTCOME**		**BTL**
C323.1	What are the key components and processes involved in the herbal drug preparation and the cultivation of medicinal plants, and what is the scope of the herbal drugs industry, especially in India?		5 EVALUTE
C323.2	What are the key health benefits and market growth potential of nutraceuticals, and how do specific herbs like Ginseng and Ashwagandha contribute to health food options?		5 EVALUTE
C323.3	What are the key considerations in formulating herbal cosmetics for products such as shampoos, dyes, face creams, toothpaste, and bleaching agents?		5 EVALUTE
C323.4	What are the key considerations for stability testing of herbal drugs according to WHO and ICH guidelines?		3 APPLY
C323.5	What are the key components of GMP (Schedule – T), and what are their specific objectives in ensuring the quality and safety of pharmaceutical products?		5 EVALUTE
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, II SEM	**REGULATION**	R17
COURSE	Biopharmaceutics and Pharmacokinetics	**COURSE CODE**	C324
COs	**COURSE OUTCOME**		**BTL**
C324.1	What are the key factors influencing drug absorption in the gastrointestinal tract (GIT) and how does protein binding of drugs affect their distribution and clinical significance?		4 ANALYZE
C324.2	What are the key factors influencing drug absorption in the gastrointestinal tract (GIT), and how does protein binding affect the distribution of drugs in the body?		4 ANALYZE
C324.3	What are the key factors influencing the renal excretion of drugs, and how do bioavailability studies contribute to our understanding of drug metabolism and efficacy?		5 EVALUTE
C324.4	How does the accumulation of drug concentrations over time affect dosing regimens?		3 APPLY
C324.5	How does the non-linear nature of drug biotransformation impact the accuracy and applicability of the Michaelis-Menton method in estimating parameters?		5 EVALUTE
PROGRAM:	B. Pham	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, II SEM	**REGULATION**	R17
COURSE	Medicinal chemistry - III lab	**COURSE CODE**	C329
COs	**COURSE OUTCOME**		**BTL**
C329.1	What is the synthesis method for 7-Hydroxy, 4-methyl coumarin?		3 APPLY
C329.2	How is the assay of chloroquine conducted to determine its pharmaceutical potency?		4 ANALYZE
C329.3	What are the advantages of using microwave irradiation technique in the preparation of medicinally important compounds or intermediates?		6 CREATE

C329.4	How can ChemDraw® be used to draw chemical structures and reactions effectively in organic chemistry?		3 APPLY
C329.5	How does drug design software assess physicochemical properties like logP, clogP, MR, molecular weight, and Hydrogen bond donors/acceptors for drug classes, and how is Lipinski's Rule of Five applied in drug likeliness screening?		3 APPLY
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, II SEM	**REGULATION**	R17
COURSE	Pharmacology - III lab	**COURSE CODE**	C3210
COs	**COURSE OUTCOME**		**BTL**
C3210.1	How is dose calculation performed in pharmacological experiments, considering factors such as drug potency and experimental design?		5 EVALUTE
C3210.2	How is antiallergic activity assessed through mast cell stabilization assay?		5 EVALUTE
C3210.3	What are the key findings regarding the anti-ulcer activity of the drug in the study, particularly in the SHAY rat model and NSAIDS-induced ulcer model?		5 EVALUTE
C3210.4	How do specific drugs impact gastrointestinal motility in experimental studies?		5 EVALUTE
C3210.5	How do agonists and antagonists affect the contractility of guinea pig ileum in experimental settings?		4 ANALYZE
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	III YEAR, II SEM	**REGULATION**	R17
COURSE	Herbal Drug Technology lab	**COURSE CODE**	C3211
COs	**COURSE OUTCOME**		**BTL**
C3211.1	What are the key phytochemical constituents identified in the preliminary screening of a given crude drug?		2 UNDERSTANDING
C3211.2	How effective are excipients of natural origin in enhancing the properties of pharmaceutical formulations?		5 EVALUATE
C3211.3	How does the incorporation of prepared and standardized extracts impact the efficacy and quality of cosmetic formulations such as creams, lotions, and shampoos?		5 EVALUATE
C3211.4	How does the integration of prepared and standardized extracts in cosmetics formulations, such as syrups, mixtures, and tablets, comply with pharmacopeial requirements, and what methods are utilized for their evaluation?"		5 EVALUATE
C3211.5	Can you explain the methods used for the determination of aldehyde content, phenolic content, and total alkaloids in a sample?		2 UNDERSTANDING

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PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	IV YEAR, I SEM	**REGULATION**	R17
COURSE	Instrumental Methods of Analysis	**COURSE CODE**	C411
COs	**COURSE OUTCOME**		**BTL**
C411.1	How do electronic transitions differ in chromophores and auxochromes, and how do solvent effects influence absorption spectra according to Beer and Lambert's laws, considering the role of instrumentation such as detectors and sample cells in spectrophotometry and fluorimetry?		3 APPLY
C411.2	What are the key principles and instrumentation used in various analytical techniques like Flame Photometry, Atomic Absorption Spectroscopy, and Nepheloturbidometry, and how do interferences affect their applications in sample analysis?		5 EVALUATE
C411.3	How do the principles and techniques of chromatography and electrophoresis differ in their methodologies, advantages, disadvantages, and applications, and what factors influence their effectiveness in various analytical procedures?		5 EVALUATE
C411.4	What are the fundamental differences in theory, instrumentation, and applications between Gas Chromatography (GC) and High-Performance Liquid Chromatography (HPLC), and how do their specific features and methodologies influence their effectiveness in analytical separations?		5 EVALUATE
C411.5	How do Ion Exchange Chromatography, Gel Chromatography, and Affinity Chromatography differ in their principles, methodologies, and applications in separating biomolecules, and what specific characteristics of each technique impact their efficacy in various analytical contexts?		5 EVALUATE
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	IV YEAR, I SEM	**REGULATION**	R17
COURSE	Industrial Pharmacy-II	**COURSE CODE**	C412
COs	**COURSE OUTCOME**		**BTL**
C412.1	What are the key considerations in pilot plant scale-up techniques, as well as the relevance of documentation and regulatory guidelines like SUPAC within the context of platform technology?		1 REMEMBER
C412.2	How do the WHO guidelines for Technology Transfer encompass diverse aspects, including terminology, quality risk management, documentation, regulatory bodies, commercialization challenges,		2 UNDERSTANDING

	and the role of Transfer of Technology (TOT) agencies in India, covering licensing, legal issues		
C412.3	How do regulatory affairs play a pivotal role in the pharmaceutical industry, encompassing historical context, regulatory authorities, the responsibilities of regulatory affairs professionals, and the comprehensive requirements and considerations for drug approval?		4 ANALYZE
C412.4	How do Quality Management Systems encompass the core concepts of quality, Total Quality Management, ISO standards, and various quality certifications, along with methodologies like Six Sigma and Quality by Design, to ensure regulatory compliance		4 ANALYZE
C412.5	How do the CDSCO and State Licensing Authorities manage their organizational responsibilities, including the CTD, COPP, and the regulatory procedures for approving New Drugs in India?		5 EVALUATE
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	IV YEAR, I SEM	**REGULATION**	R17
COURSE	Pharmacy Practice	**COURSE CODE**	C413
COs	**COURSE OUTCOME**		**BTL**
C413.1	How do the structures and functions of hospital pharmacies differ from community pharmacies, and what are the key organizational elements, legal requirements, and responsibilities of pharmacists in these distinct settings?		2 UNDERSTANDING
C413.2	How do the drug distribution systems in hospitals differ from the practices in community pharmacies, and what are the key considerations in therapeutic drug monitoring?		2 UNDERSTANDING
C413.3	How does the role of pharmacists in Drug and Poison Information Centers differ from their involvement in Patient Counseling and Hospital Education Programs?		4 ANALYZE
C413.4	How does the role of a Clinical Pharmacist in drug therapy monitoring and pharmaceutical care differ from considerations surrounding OTC sales, emphasizing the responsible use of commonly available medications without prescription?		2 UNDERSTANDING
C413.5	How does the organization of a drug store, contribute to effective management and cost-efficiency, and what methods are utilized to analyze drug expenditure in such a setting?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	IV YEAR, I SEM	**REGULATION**	R17
COURSE	Novel Drug Delivery System	**COURSE CODE**	C414
COs	**COURSE OUTCOME**		**BTL**
C414.1	How do CDDS, incorporating the selection of drug candidates and various formulation approaches, and application in the formulation of CRDDS?		2 UNDERSTANDING
C414.2	How do microencapsulation, MDDS focusing on bio adhesion, and implantable DDS differ in their methods, advantages, and application considerations?		4 ANALYZE
C414.3	How do TDDS, GDDS, and NPDDS vary in their methodologies, components, and approaches, and what are the key factors		2 UNDERSTANDING

	influencing their effectiveness and applications in pharmaceutical delivery?		
C414.4	How do targeted drug delivery systems utilize various strategies and considering their respective concepts, advantages, disadvantages, and applications in pharmaceutical and biomedical fields?		4 ANALYZE
C414.5	What are the introductory aspects of intraocular drug delivery, including intraocular barriers and methods to overcome them, as well as preliminary study, ocular formulations, and ousters?		1 REMENBER
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	IV YEAR, I SEM	**REGULATION**	R17
COURSE	Instrumental Methods of Analysis Lab	**COURSE CODE**	C419
COs	**COURSE OUTCOME**		**BTL**
C419.1	How is the absorption maxima of organic compounds determined, and what is the impact of different solvents on their absorption maxima?		2 UNDERSTANDING
C419.2	What is the colorimetric method for estimating dextrose, and how does it work?		2 UNDERSTANDING
C419.3	How is sulfanilamide estimated using colorimetry, and what is the principle behind this analytical method?		2 UNDERSTANDING
C419.4	What is the UV spectroscopy method used for the simultaneous estimation of ibuprofen and paracetamol, and what are the key considerations in this analytical technique?		2 UNDERSTANDING
C419.5	What is the UV-spectrophotometric method for the assay of paracetamol, and what are the key principles and steps involved in this assay?		2 UNDERSTANDING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	IV YEAR, I SEM	**REGULATION**	R17
COURSE	Practice school	**COURSE CODE**	C4110
COs	**COURSE OUTCOME**		**BTL**
C4110.1	How does the industry visit program, involving interactions with executives and what is the process for addressing specific issues and reporting the findings?		2 UNDERSTANDING
C4110.2	What is the structure and purpose of the industry visits and interactions and how are the findings and outcomes documented?		2 UNDERSTANDING
C4110.3	What are the prominent medication trends, prescription patterns, and significant findings observed through the comprehensive analysis of various pharmacy shops in the designated area?		2 UNDERSTANDING
C4110.4	What are the diverse medicinal plants identified in the gardens, their respective therapeutic uses for different disorders, and their significance, as observed by the students during their study period?		2 UNDERSTANDING
C4110.5	What are the key findings and insights derived from the analysis of significant cases filed by drug control officers in regulatory affairs, and the innovative formulations developed using unconventional equipment in the field of formulation aspects?		4 ANALYZING
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21

YEAR/ SEM:	IV YEAR, I SEM	REGULATION	R17
COURSE	Industrial training	COURSE CODE	C4111

COs	COURSE OUTCOME	BTL
C4111.1	How does industrial training contribute the knowledge of pharmaceutical manufacturing technologies and workflow?	2. Understand
C4111.2	In what ways does industrial training help to understand the importance of quality control and assurance in the pharmaceutical industry?	2. Understand
C4111.3	How does hands-on experience in industrial training assist in learning about regulatory compliance and the documentation required for pharmaceutical production?	3. Apply
C4111.4	What are the key skills and competencies to develop during industrial training, and how do these skills enhance their future career prospects?	4. Analyse
C4111.5	How does industrial training expose to the challenges and problem-solving strategies involved in the pharmaceutical industry?	4. Analyse

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PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	IV YEAR, II SEM	**REGULATION**	R17
COURSE	Biostatistics and Research Methodology	**COURSE CODE**	C421
COs	**COURSE OUTCOME**		**BTL**
C421.1	How do measures of central tendency relate to pharmaceutical examples, and how are measures of dispersion utilized in solving pharmaceutical problems?		3 APPLY
C421.2	What are the applications of regression in pharmaceutical contexts, especially in curve fitting using the method of least squares, multiple regression, and understanding standard error of regression?		3 APPLY
C421.3	In what ways are non-parametric tests like Wilcoxon Rank Sum, Mann-Whitney U, Kruskal-Wallis, and Friedman tests utilized in pharmaceutical research?		3 APPLY
C421.4	How do Excel, SPSS, MINITAB®, and R, as online statistical software tools, contribute to statistical analysis in both industrial processes and clinical trial approaches, and what are the key advantages of utilizing these platforms within these distinct domains?		3 APPLY
C421.5	How do factorial designs, including the 22, 23 designs, offer advantages in experimental studies, and how does Response Surface Methodology?		3 APPLY
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	IV YEAR, II SEM	**REGULATION**	R17
COURSE	Social and Preventive Pharmacy	**COURSE CODE**	C422
COs	**COURSE OUTCOME**		**BTL**
C422.1	How do social factors influence health and disease, and what role does education play in addressing issues related to nutrition, balanced diet, vitamin deficiencies, malnutrition, and hygiene in preventing and controlling diseases within different societal contexts?		5 EVALUATE
C422.2	How can the principles of preventive medicine be applied to effectively control and prevent a range of diseases, including cholera, SARS, Ebola, influenza, malaria, and chronic conditions as well as address issues related to drug addiction and substance abuse?		3 APPLY
C422.3	In what ways do various national health programs, such as the HIV and AIDS control program, TB control, IDSP, mental health		2 UNDERSTANDING

	program, and immunization initiatives, contribute to public health, disease prevention, and control in the country?		
C422.4	How do national health intervention programs for mother and child and family welfareand what role does the WHO play in supporting and guiding these national health programs?		2 UNDERSTANDING
C422.5	How do community services in rural, urban, and school health, including the functions of PHC, initiatives for rural sanitation improvement, the National Urban Health Mission, and health promotion/education.		4 ANALYZE
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	IV YEAR, II SEM	**REGULATION**	R17
COURSE	Pharmaceutical Jurisprudence	**COURSE CODE**	C423
COs	**COURSE OUTCOME**		**BTL**
C423.1	What are the key legal restrictions and regulatory frameworks governing the import, manufacture, and penalties associated with drugs and cosmetics, including classes prohibited from import, licensing, and manufacture and sale?		5 EVALUATE
C423.2	What are the specific guidelines, restrictions, and penalties outlined in Schedule regarding the sale of drugs wholesale, at retail, and under restricted licenses?		1 REMEMBER
C423.3	What are the foundational regulations and penalties concerning pharmacy governance, education standards, pharmacist registration, as well as the Acts governing related to Narcotic Drugs and Psychotropic Substances?		2 UNDERSTANDING
C423.4	What are the core regulations and stipulations under the Prevention of Cruelty to Animals Act-1960, DPCO-2013, and their respective impacts on animal welfare and pharmaceutical pricing?"		1 REMEMBER
C423.5	What are the key legislative committees and ethical guidelines pertinent to pharmaceutical regulations, including the roles of the Committee, Code of Pharmaceutical Ethics, Medical Termination of Pregnancy Act, Right to Information Act, and the fundamentals of Intellectual Property Rights (IPR)?		1 REMEMBER
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	IV YEAR, II SEM	**REGULATION**	R17
COURSE	Computer Aided Drug design	**COURSE CODE**	C424
COs	**COURSE OUTCOME**		**BTL**
C424.1	How does Analog Based Drug Design utilize bioisosterism, and can you provide three case studies illustrating its effectiveness in drug discovery?		5 EVALUATE
C424.2	What are the key differences between SAR (Structure-Activity Relationship) and QSAR (Quantitative Structure-Activity Relationship), and how has QSAR evolved in terms of physicochemical parameter determination methods and analysis techniques?		4 ANALYSE
C424.3	How does molecular docking differ between rigid and flexible docking methods, and how can virtual screening techniques like		3 APPLY

	pharmacophore mapping complement molecular docking in drug discovery?		
C424.4	How do ADME databases and chemical, biochemical, and pharmaceutical databases contribute to the fields of bioinformatics and chemoinformatics in drug design?		5 EVALUATE
C424.5	How do molecular mechanics and quantum mechanics differ in modeling molecular structures and interactions, and what are the key techniques used in energy minimization and global conformational minima determination?		4 ANALYSE
PROGRAM:	B. Pharm	**ACADEMIC YEAR**	2020-21.
YEAR/ SEM:	IV YEAR, I SEM	**REGULATION**	R17
COURSE	Project Work	**COURSE CODE**	C428
COs	**COURSE OUTCOME**		**BTL**
C428.1	What are the key objectives and expected outcomes the project, and how do they contribute to your overall learning and professional development?		5. Evaluate
C428.2	How did you select the topic for your project, and what research methodologies did you use to investigate your chosen subject?		3. Apply
C428.3	What challenges did you encounter during the execution of your project, and how did you address and overcome these obstacles?		4. Analyse
C428.4	How does the project align with current trends and advancements in the pharmaceutical field, and what potential impact could your findings have on the industry?		4. Analyse
C428.5	What skills and knowledge did you gain through the completion of the project, and how do you plan to apply these in your future career?		3. Apply

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