

B.PHARM. DEGREE EXAMINATION
PCI PATTERN – SEMESTER II FIRST YEAR
PHARMACEUTICAL ORGANIC CHEMISTRY – I

- Define Elimination reaction. Discuss the mechanism of E₁ and E₂ reactions.
- Explain the free radical addition reaction of conjugated dienes with examples.
- Describe the mechanism, kinetics and stereochemistry of SN₂ reaction.
- Explain the acidity of carboxylic acids.
- Stability and rearrangement of carbocations.
- Mechanism and examples of aldol condensation.
- Explain the effect of substituents on basicity of amines.
- Explain Diels Alder reaction with examples.
- How to differentiate primary, secondary and tertiary alcohols?
- SN₁ versus SN₂ reactions.
- Benzoin condensation.
- Explain about Markownikoff's rule.
- Define SP₃ hybridization.
- Define optical isomerism with one example.
- Give the structure of 2-Pentanol and isopropyl alcohol.
- Define nucleophiles and electrophiles.
- Structure and use of formaldehyde and paraldehyde.
- Define conjugated dienes with examples.
- What is tautomerism?
- Any two qualitative test for aldehyde.
- Structure and uses of methyl salicylate.
- Define electromeric effect.
- Discuss SN₁ and SN₂ reactions with special reference to mechanism reactivity and stereochemistry.
- What are alkyl halides? How will you prepare alkyl halides and aryl alkyl halides?
- Explain the phenomenon of SP₄ & SP₃ trigonal hybridization with suitable example.
- What is Diazonium reaction? Explain the general reaction.
- Explain the Markownikoff's rule and peroxide effect.
- What is Diel's Alder reaction? Explain with examples.
- Write the method of preparation of ether by williamson's synthesis.
- How chloroform is prepared industrially? Write the properties, analytical test and uses of Chloroform.
- Explain the formation of bonding, antibonding and nonbonding orbitals.
- Give any three methods of preparation and three reactions of Amines.
- Explain the photohalogenation and thermal halogenations of alkanes.
- Explain any three methods of preparation of alcohols.
- Define and classify Carboxylic acids and Esters.
- Define Ozonolysis with examples.
- Wolf Kishner reduction.
- What is hyperconjugation?
- Give the IUPAC name of HO-CH₂-CH₂-COOH. How is glycol synthesized?
- Explain resonance effect.
- Give the structure and use of amphetamine.
- Write the structure and uses of cinnamaldehyde.
- Write the structure and use of Benzyl Benzoate.
- Explain the mechanism, reactivity and kinetics of SN₁ reaction.

- Explain Perkin condensation with mechanism and examples.
 - Explain the mechanism of free radical addition reaction of alkenes with examples.
 - Explain the basicity of amines.
 - Halogenation of alkanes.
 - Ozonolysis.
 - Explain Saytzeffs rule with examples.
 - Explain the mechanism of cannizaro reaction with examples.
 - E₁ versus E₂.
 - Describe in detail about electrophilles and nucleophilles with examples.
 - Differentiate between primary, secondary, tertiary amines.
 - Explain about hybridization. Describe the molecular orbital structure of ethane.
 - Define and classify alcohols.
 - Define hydrogen bonding with one example.
 - Structure and use of ethylene diamine.
 - 1, 4 addition of conjugated dienes.
 - Why aniline is less basic than ammonia?
 - Structure and use of vanillin and propylene glycol.
 - Qualitative test for amides.
 - IUPAC name of HO – CH₂-CH₂-CH₂ – COOH.
 - Medicinal uses and structure of Lactic acid and amphetamine.
 - General test to identify acetone and benzyl alcohol.
 - Discuss Sp² hybridization in alkenes.
 - Give the method of preparation of Carboxylic acid.
 - Acidity of carboxylic acid.
 - How will you distinguish primary, secondary and tertiary amines?
 - Discuss the basicity of amines.
 - How are aldehydes prepared? Give their important reactions.
 - Give the method of preparation on allyl halide.
 - Give some important reactions of alcohols.
 - Write about the effect of substituent on acidity of carboxylic acid.
 - Write a note on benzoin condensation.
 - Explain SN¹ reaction.
 - Write about IUPAC rules for naming cycloalkanes.
 - Write a note on Peroxide effect.
 - Write about conjugated dienes.
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- Define ozonolysis.
 - How will you distinguish 1-butyne and 2 butyne?
 - Give the structure and uses of chloroform.
 - Write the structure and use of: a) Cetosteryl alcohol b) Glycerol.
 - Define Cannizzaro reaction.
 - Give the structure and use of: a) Hexamine b) Vanillin.
 - Define inductive effect.
 - What happens when methane is treated with Iodine in presence of an oxidizing agent HIO₃?
 - Write the structure of the following: a) 1-methyl pentene b) 2-ethyl butane.
 - Define Isomerism.
 - Discuss the mechanism of E₁ and E₂ reactions of alkyl halides.

- Explain in detail classification of organic compounds with common and IUPAC system of nomenclature of organic compounds.
- Write short notes on:
 - Give the method of preparation of alcohol.
 - How to distinguish primary, secondary, tertiary alcohols.
 - Write a note on Sp^2 hybridization in alkenes.
 - Write a note on ozonolysis.
 - Discuss the reaction of salts of carboxylic acid.
 - Write in detail about structural isomerism with examples.
 - Explain Saytzeff's rule.
 - Write about cannizzaro reaction.
 - Explain Perkin's condensation.
 - What are amines and give the classification of it with examples.
 - What is Markownikoff's rule of addition.
 - What do you mean by Tautomerism.
 - Name the following alkyl gp $CH_3-CH_2-CH_2-(CH_3)_2CH$.
 - Write the structural formula of,
 - 2-propenal
 - 2,2,4-trimethylpentene
 - Write the medicinal uses of
 - Benzoyl alcohol
 - Ethanolamine.
 - Write the structure and use of
 - Amphetamine
 - Propylene glycol 6. What is Hinsberg reagent?
 - What is Inductive effect?
 - What is allylic rearrangement.
 - Give the structure and use of Iodoform.
 - Define isomerism.
 - Write about SN^1 and SN^2 reactions of alkyl halides.
 - Explain Diel's aldes reaction and free radical addition reaction of conjugated diene.
 - What is Isomerism? Classify them with suitable examples.
 - Write about allylic rearrangement.
 - What is Markownikoff's rule of addition.
 - Write a note on ozonolysis.
 - What are alcohols? Discuss various types of alcohols.
 - Discuss acidity of carboxylic acid.
 - Write about aldol condensation.
 - Explain why carbonyl carbon undergo nucleophilic addition.
 - Give the qualitative test for alcohols.
 - Write about Cannizzaro reaction.
 - Define hybridization.
 - give the structure and use of
 - Dichloromethane
 - Amphetamine 3. Define Saytzeff's rule.
 - Define Isomerism.
 - Give the structure and use of
 - Chloral hydrate
 - Acetone

- What is Inductive effect?
- Define hydrolysis and condensation with example.
- Give the IUPAC name for
- $\text{CH}_3\text{OCH}_2\text{CH}_3$
- $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CN}$
- Write the structured formula for the following
- 2-propanone
- Chloro-2-methylpropane
- 10. Write the structure and use of
- Methylsalicylate
- Benzylbenzoate
- What are alcohols? Classify them. Outline the nomenclature, method of preparation and chemical reactions of alcohols.
- Outline the synthesis and mechanism of
- Aldol condensation
- Cannizzaro reaction
- Benzoin condensation
- Perkin condensation
- Describe any two methods to differentiate 1° , 2° and 3° amines.
- Give the reactions of carboxylic acids.
- Discuss the general methods of preparations and properties of aliphatic amines.
- Factors affecting SN^1 and SN^2 reactions.
- Discuss free radical and electrophilic addition reactions of conjugated dienes.
- Explain the mechanism by which alkyl halides undergo elimination reaction with suitable examples.
- Discuss the mechanism of bimolecular nucleophilic substitution reaction.
- What are carboxylic acids? Draw the resonating structures of carboxylate ion.
- Discuss factors affecting E^1 and E^2 reactions.
- Write any three qualitative tests of carboxylic acid.
- How will you distinguish between aldehydes and ketones.
- Draw the structure and uses of Benzyl benzoate, Succinic acid.
- Draw the structure and uses of Ethanolamine, Ethylenediamine.
- Draw the structure and uses of Acetyl salicylic acid, Lactic acid.
- Draw the structure and uses of Hexamine, Cinnamaldehyde.
- Discuss the two simplest aliphatic Carboxylic acid with their IUPAC names.
- Why ammonia is basic in nature.
- State anti-Markownikov rule.
- What is the full form of IUPAC.
- Explain why tertiary amine is more basic than the other two amines?
- Define elimination reaction.

B.PHARM. DEGREE EXAMINATION
PCI PATTERN SEMESTER III
PHARMACEUTICAL ORGANIC CHEMISTRY – II

- Discuss three different methods of synthesis of Anthracene. Mention some of its important properties. How can be Anthracene converted to anthraquinone and alizarine.
- Explain the preparation and effect of substituents on the acidic character of phenols.
- Define aromatic electrophilic substitution reactions. Discuss the reaction and mechanism of Nitration, Halogenation, Sulphonation, Friedel-craft alkylation and Friedel-craft arylation.
- Write any three methods for synthesis of Diphenyl methane.
- Explain chemical reactions of aromatic carboxylic acids.
- What are the methods used for the synthesis of phenanthrene.
- Discuss the basicity of amines.
- Write the preparation and synthetic utility of diazonium compounds.
- Explain about Resonance theory of benzene.
- Write any five reactions of naphthalene.
- What are lipids? Write their classification in detail.
- Write a note on Bayer's strain theory.
- Difference between an oil and fat.
- Hinsberg test.
- Structure and uses of DDT and BHC.
- Waxes.
- Hybridization.
- Mechanism of Halogenation of benzene.
- Fatty acids.
- Sachse Mohr's theory.
- Saponification value.
- Structure and use of Cresol and Resorcinol.
- Explain the facts which supporting Kekule structure of Benzene. Briefly discuss about activating and deactivating group in Benzene.
- Write the general method of preparations and reactions of aromatic amines.
- Explain the various reactions of Fatty acids
- Determination of Iodine value with its significance.
- Describe the effect of substituent of Benzene.
- Explain any three method for preparation of Phenol.
- Write a detailed note on Basicity of amines.
- Write briefly on acidity and effect of substituents of Aromatic acids.
- Explain the determination of acid value with its significance.
- What happens when Naphthalene?
 - Reduce with H_2/Ni
 - Oxidise with $KMnO_4$
 - Addition of excess Cl_2
 - With $Con.HNO_3$ and $Con.H_2SO_4$
 - With $Con.H_2SO_4$ at $40^\circ C$.
- Explain the Haworth synthesis for Naphthalene.
- Describe about Coulson and Moffitt's modification.
- Explain any two reactions of each of Cyclopropane and Cyclobutane.
- Two synthetic utility of diazonium salt.

- Write a note on the synthetic utility of aryl diazonium salts.
- Write a note on the determination of acid value in fats and oils.
- Brief out on Fries rearrangement with mechanism.
- Write a note on the effect of electron withdrawing groups on electrophilic aromatic substitution reaction in benzene.
- Write the synthesis of aryl alkyl ethers from phenol.
- Give an account for reactions of anthracene.
- Write the methods of synthesis of aromatic amines.
- Write a note on the types of rancidity and the methods for prevention of rancidity.
- Write the structure and uses of Saccharin and Chloramine.
- Give a short account on primary, secondary and tertiary amines with examples.
- What is Reichert- Meissl value?
- Brief out on reduction reaction of phenanthrene.
- Define fats, oils and waxes
- Write the reaction of esterification of benzoic acid
- Write on Wurtz Fittig reaction.
- Mention the drawbacks of Friedel crafts alkylation.
- Write the catalytic reduction reaction of propane.
- Write a note on Elb's reaction.

B.PHARM. DEGREE EXAMINATION
PCI PATTERN – SEMESTER IV
PHARMACEUTICAL ORGANIC CHEMISTRY – III

- Discuss the sequence rules and RS system of optical isomers.
- Explain the determination of configuration of geometrical isomers.
- Write the synthesis, properties and medicinal uses of pyridine.
- Element of symmetry.
- Stereoisomerism of biphenyl compounds.
- Relative aromaticity and reactivity of pyrrole, furan, and thiophene.
- Dakin reaction.
- Beckmann's rearrangement.
- Stereospecific and stereoselective reaction.
- Racemic modification.
- Write the synthesis and medicinal uses of imidazole.
- Explain electrophilic reaction of oxazole.
- Explain the stability of axial and equatorial substitution of cyclohexane.
- Define configurational and conformational isomers.
- Explain the optical activity of meso and racemic form.
- Write the Paalknoor synthesis of pyrrole.
- Write the Skraup synthesis of quinoline.
- Write the Chichibabin reaction.
- Write the medicinal uses of indole.
- Write the reduction by Zn-Hg.
- What is Wolff Kishner reduction?
- Write the importance of Birch reduction.
- Describe the synthesis, chemical reactions and medicinal uses of Indole.
- Discuss the mechanism of reaction and applications of Oppenauer-oxidation and Clemmensen reduction.
- Summarize the criteria for a compound to be optically active and the methods used in resolution of racemic mixtures with examples.
- Explain the Canh Ingold Prelog (CIP) sequence rule system of nomenclature of Optical isomers.
- Discuss in detail the partial and absolute asymmetric synthesis.
- Describe about the stereochemistry of Biphenyl compounds.
- Illustrate the conformational analysis of ethane.
- Describe the structure and reactivity of Pyrrole.
- Discuss the Skraup's synthesis of Quinoline and its derivatives.
- Illustrate the synthesis and medicinal uses of Purine and its derivatives.
- Outline the preparation and chemical reactions of Acridine.
- Enumerate the applications of lithium aluminium hydride with examples.
- Sketch the medicinal uses of Thiazole derivatives with its structure.
- State the applications of Dakin reaction with examples.
- What is absolute Asymmetric synthesis? Give example.
- Recall the applications of sodium borohydride.
- Sketch the conformers of Cyclohexane.
- Define with the example of Schmidt reaction.
- List out the elements of symmetry with example.

- Recall any two methods of preparation of oxazole.
- Sketch any two medicinal derivatives of the quinoline with its structure.
- State the applications of Beckmann rearrangement.
- Discuss the conformational isomerism in monosubstituted and disubstituted cyclohexane.
- Skraup synthesis (5 marks)
- Fischer Indole synthesis (2½ marks)
- Pall-Knorr synthesis (2½ marks)
- What are rearrangement reactions? Write a detailed account on Schmidt rearrangement.
- Explain DL system of nomenclature. List out its disadvantages.
- What are the conditions for a compound to be optically active? Explain optical activity in compounds containing two different chiral carbon atoms.
- Write a brief note on Atropisomerism.
- Write any two methods of preparation of pyridine? Add a note on its basicity.
- Write the methods of synthesis and reactions of isoquinoline.
- Explain the methods of preparation and any three reactions of thiophene.
- What is asymmetric synthesis? Describe the types of asymmetric synthesis with suitable examples.
- Explain with mechanism any one reaction which is used for the reduction of carbonyl compounds to hydrocarbons.
- Write the reaction, mechanism and applications of Dakin reaction?
- Which of the following is optically active-lactic acid or propionic acid. Give reason.
- What are syn and anti forms?
- Define racemic mixture. List out any five methods for the resolution of racemic modification.
- Write all the conformers of 1,2-dichloro ethane.
- What is the product obtained on treating pyrrole and furan with maleic anhydride?
- Write any one method of synthesis of azepines and give their medicinal uses.
- Write any one method of synthesis and any one reaction of thiazole.
- Why is nitrobenzene generally used as the oxidizing agent in Skraup synthesis?
- Write the reaction showing an aldoxime undergoing Beckmann rearrangement.
- With a suitable example explain centre of symmetry. What are geometrical isomers? Explain the methods to determine the configuration of geometrical isomers?
- Discuss the methods of preparation and electrophilic substitution reactions of pyrrole.
- Classify rearrangement reactions? Describe the reaction, mechanism, salient features and applications of Beckmann rearrangement.
- Applying sequence rules explain RS System of nomenclature.
- Explain the stereochemistry of biphenyls.
- Explain the elements of symmetry with suitable examples.
- Define and classify heterocyclic compounds. Explain the nomenclature of monocyclic and fused heterocyclic compounds.
- Write the methods of preparation and any two reactions of imidazole.
- Write the structure and name of monocyclic heterocyclic compounds with two different heteroatoms. Explain the methods of preparation of any one of them.
- Summarize the synthetic applications of lithium aluminium hydride.
- Write a brief note on Dakin reaction.
- Compare and contrast Clemmensen reduction and Wolf Kishner reduction.
- What do you mean by Partial and Absolute asymmetric synthesis?
- What do you mean by a mesocompound?

- Define stereoselective reactions and give a suitable example.
- What is enzymatic resolution of racemic modification?
- Write the structure and numbering for the following heterocyclic compounds
- a) Aziridine b) 1,3-diazocine
- What are purines? Write the structure and use of any one medicinal compound belonging to this category.
- What is Chichibabin reaction?
- What is the purpose of liquid ammonia and alcohol in Birch reduction?
- Write the reduction reactions of pyridine.
- What is Claisen-Schmidt condensation?
- Define racemic modification? Discuss the method of resolution of racemic modification by formation of diastereomers.
- Discuss the methods of preparation and chemical reactions of pyridine.
- Describe the reaction and mechanism of (a) Birch reduction (b) Wolf Kishner reduction.
- Explain asymmetric synthesis.
- Explain the nomenclature of geometrical isomers.
- Discuss the conformational isomerism in n-butane.
- Compare the aromaticity and reactivity of pyrrole, furan and thiophene.
- Write the methods of synthesis and medicinal uses of pyrimidine.
- Write the electrophilic substitution reactions of indole.
- Explain the synthetic applications of sodium borohydride.
- Write a brief note on Oppenauer oxidation?
- Explain with mechanism Claisen-Schmidt condensation. Add a note on its application.
- Distinguish between enantiomers and diastereomers.
- What are the disadvantages of biochemical method of resolution of racemic mixture?
- Define stereospecific reactions and give a suitable example.
- Compound A has melting point 300°C and boiling point 40°C. Compound B has melting point 130°C and boiling point 60°C. Determine whether compounds A and B are cis or trans isomers.
- What are fused heterocyclic compounds? Give examples.
- Why is pyrrole weakly basic?
- Write any one method of synthesis and any one reaction of acridine.
- What happens when.
- Quinoline reacts with potassium permanganate.
- Pyrazole reacts with concentrated nitric acid.
- What is Schmidt rearrangement?
- Write any two applications of Clemmensen reduction?

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII
PHARMACEUTICAL PRODUCT DEVELOPMENT

- Discuss about the regulations related to different types of dosage forms.
- Briefly write about optimization by factorial designs.
- Write about the glass packaging material for pharmaceutical product development.
- Advantages and disadvantages of plastic containers.
- Solvents and solubilizers.
- Suspending agents.
- Semisolid excipients.
- Capsule excipients.
- Excipients in aerosols products.
- Quality control testing of capsule.
- Terminology of packaging material.
- Objectives of pharmaceutical product development.
- Advantages of glass container.
- Tertiary packaging.
- Emulsifying agents.
- Polyethylene glycol.
- Types of problems in optimization.
- Mention the elements of quality by design.
- Classification non-ionic surfactant.
- Systemic optimization techniques.
- Application of optimization.
- Pharmaceutical excipients.

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII
PHARMACEUTICAL REGULATORY SCIENCES

- Explain the approval process of timeline involved in Investigational New Drug.
- Explain the procedure for export of pharmaceutical products.
- Explain the design in developing clinical trial protocols.
- Explain the roles and responsibilities of the regulatory authority.
- Explain the Orange Book features.
- Explain the informed consent process & procedure involved in clinical trials.
- Explain the Drug Master File.
- Explain the Common Technical Document.
- Explain the approval process for implementing the changes to an approved NDA.
- Explain the regulatory authorities of Australia.
- Explain the preclinical studies involved in drug discovery.
- Explain the concept of generics & Generic drug product development.
- Phase 3 clinical trial.
- CDSCO.
- WHO.
- Regulatory authorities of Canada.
- Purple Book.
- Phase 2 clinical trial.
- EMA.
- Functions of Ethics committee.
- Investigational Product.
- Three arm study.

B.PHARM. DEGREE EXAMINATION
PCI Regulation SEMESTER - I
SUBJECT – PHARMACEUTICS – I

- Define Prescription. Discuss various parts of prescription with an example.
- Define Emulsion. Write the methods of preparations and identification tests for determination of types of Emulsion.
- Define Suppository. Classify suppository bases. Explain in detail the methods of preparation and write the ideal properties of suppository bases.
- Write about the Career opportunities in Pharmacy profession.
- Define dosage forms and give its classification.
- a) Prepare 150 ml of 4% potassium permanganate solution and label with directions for preparing 500ml of 1 in 2500 solution.
- b) Prepare 400ml of 70% alcohol from 95% alcohol (By Alligation).
- Write note on: Hygroscopic, Efflorescent & Deliquescent powders.
- Define Syrup. Write the advantages, disadvantages and methods of preparations.
- Distinguish the following with examples:
 - a) Lotions with Liniments. b) Gargles with Mouth washes.
- Differentiate Flocculated and Deflocculated suspensions.
- What are the causes of Physical incompatibilities and how to overcome?
- Define Ointment. Write the types and ideal properties of ointment bases.
- Define Pharmacopoeia and list out the Pharmacopoeias which are being referred extensively.
- Excipients used in formulation of liquid dosage forms.
- Write the formulae by which doses can be calculated depending on age.
- Define Proof Spirit.
- Write the classification of Powders.
- Write about Eutectic mixtures.
- What is Draught?
- Define Suspension and give examples of suspending agents.
- What is therapeutic Incompatibility and write the sources of errors?
- Define Gels. What are the different gelling agents?
- Define posology. Discuss the factors affecting selection of dose.
- Classify powders with suitable examples. Write a note on advantages and disadvantages of powders.
- Define incompatibility. Explain therapeutic incompatibility with examples.
- Brief note on Indian pharmacopoeia.
- Write about eutectic and effervescent powders.
- Discuss physical stability of suspension.
- Differentiate ointments and pastes.
- Give the classification of emulsifying agents with examples.
- Discuss the evaluation tests for suppository.
- Calculate the quantity of sodium chloride required for 500 ml of a 0.9 percent solution.
- Prepare 600 ml of 60 percent alcohol from 95 percent alcohol.
- Write about the preparation of Gels.
- Write a note on handling of prescription.

- What are throat paints? Give the preparation of any one official throat paint.
- What is a Pharmacopoeia?
- Define superscription.
- Give Fried's formula.
- What is proof spirit?
- What are efflorescent powders?
- What do you mean by organoleptic additives?
- What is a co solvent? Give an example.
- How do you lubricate a suppository mould?
- What is Forbe's method?
- What is degree of flocculation?
- Discuss the various solubility enhancement techniques.
- Write the mechanism of dermal penetration. Explain the method of preparation of creams.
- What are suspensions? Give classification of suspensions. Explain different components used for preparation of suspension.
- Discuss history and development of profession of pharmacy in India.
- Discuss different errors in prescription.
- a) How will you prepare 200 ml of 60 percent alcohol from 90 percent and 50 percent alcohols.
 - b) Calculate the dose for a 9 years old child when the adult dose is 250mg.
- Discuss the bulk powders which meant for external use.
- Write a note on Elixir. Give the difference between Syrup and Elixir.
- Discuss the Suspending agents used to stabilize the suspensions.
- Write note on Instability of emulsions.
- Explain how Suppositories are evaluated.
- Give the fusion method preparation of ointment with a suitable example.
- What do you understand by Indian Pharmacopoeia?
- Give advantages and disadvantages of liquid dosage form.
- What is an inscription?
- How pediatric dose is calculated on the basis of body weight?
- Give the types of dusting powders.
- What are Preservatives? Give an example.
- What are Ear drops?
- Give the qualities of a good suspension.
- What are Emulsifying agents? Give examples.
- Differentiate between ointments and pastes.
- Define semisolids. Write about different ointment bases.
- Differentiate flocculated and deflocculated suspension. Write a note on stability problems of suspensions.
- Write the evaluation tests for Ointments.
- Write in brief about Pharmacy as a career.
- Write about errors in prescription.
- Explain geometric dilution.
- Give the formulation of elixir with suitable examples.
- Explain solubility enhancement methods.
- Write the various tests to identify the type of emulsion.

- Give the properties of an ideal suppository base.
 - Write in brief about alkaloidal incompatibility with suitable examples and methods to overcome it.
 - Write the factors affecting dermal penetration of drugs.
 - Define mouthwash and gargle.
 - What is an excipient? Give example.
 - Write any two dose calculation formulas based on age.
 - What is Extra Pharmacopoeia?
 - Define isotonic solution.
 - What are efflorescent powders?
 - What is phase inversion?
 - What is a flocculating agent?
 - What is Lugol's solution?
 - Use of calamine and bentonite in calamine lotion.
 - Define Dosage forms. Classify various types of dosage forms with examples and mention its advantages and disadvantages.
 - Define and classify Emulsion. Discuss about types of emulsifying agent and elaborate on various methods of emulsion preparation and stability problems associated with emulsion on storage.
 - Define Incompatibility. Explain about different types of incompatibility with suitable examples and mention about its remedies.
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- Write in detail about different edition and volumes of Indian Pharmacopoeia.
 - Explain about different parts of Prescription.
 - Enumerate the factors affecting Posology.
 - Give the complete classification of powders with example
 - a. Calculate the volume of each of 90%, 60%, 30% of alcohol and water required to produce 500 ml of 50% alcohol.
 - b. What % strength corresponds to 40^o O/P and 50^o U/P?
 - Mention the difference between Lotion and Liniment.
 - Differentiate Flocculated and Deflocculated system.
 - Give the property of Ideal suppository base.
 - Explain in detail about preparation and evaluation of Gels.
 - What is Martindale?
 - Imperial and Metric system
 - Methods used for measuring Isotonicity.
 - Write about Fried's rule.
 - Explain Forbe's method.
 - Is there any need of suspending agent in milk of Magnesia? Why.
 - Write about Calibration of suppository mould.
 - Characteristics of Hygroscopic powders. Give example.
 - Define Enema and mention its type.
 - Ideal properties of Ointment base.
 - Define Pharmacopoeia. Explain about its significance. Give a brief review on the development of Indian Pharmacopoeia and British Pharmacopoeia.
 - Define Posology. Enumerate the factors affecting posology. How paediatric dose is calculated on the basis of age, bodyweight and body surface area.

- Define Incompatibility. Describe about various types of incompatibility with examples and provide its remedies.
- Explain about different parts of Prescription.
- How much ml of 30% dextrose in water and 60% dextrose in water are needed to make 750 ml of 45% dextrose in water? What % strength corresponds to 40⁰ O/P and 60⁰ U/P
- Discuss about Powders used for external use with examples
- Write about method of preparation of Throat Paint and its application.
- Differentiate Flocculated and Deflocculated suspension.
- Explain different methods of preparation of Emulsion.
- Describe the properties of Ideal suppository base.
- What are pastes? Give its salient features .Comment on preparation of paste.
- Classify gels and enlist components used in preparation of gels.
- Mention two stability problems associated with Emulsion.
- Difference between Simple and Compound powder. Give example
- If the adult dose is 60 mg and the age of child is 6 years what will be the dose for the child according to Dilling's rule.
- Convert 90% v/v alcohol into its proof strength.
- Explain Synergistic effect.
- What is mean by Counter irritant? Give example.
- Write about Diffusible and Indiffusible solids.
- Define the term Displacement value.
- Define emulsion.
- Mention about types of Ointment bases.
- Define Prescription. Explain about different parts of Prescription. Discuss about handling of Prescription and rectification of Errors in Prescription.
- Define and classify Suppositories. Explain about different method of preparation and its ideal properties.
- Define and classify Gels. Explain in detail about preparation and evaluation of Gels
- Give note on the different edition and volumes of Indian Pharmacopoeia.
- a. How much ml of 20% dextrose in water and 50% dextrose in water are needed to make 750 ml of 35% dextrose in water?
- b. What % strength corresponds to 30⁰ O/P and 40⁰ U/P?
- Give the complete classification of Powders with example.
- Discuss about different excipients used in Liquid dosage forms?
- Define Syrup. Mention its type and method of preparation.
- Elaborate different stability problems associated with Emulsions and mention how to overcome it.
- Write the difference between Flocculated and Deflocculated suspension.
- What is meant by Physical incompatibility? Give examples.
- What are Pastes? Give its salient features .Comment on preparation of Paste.
- What is Extra Pharmacopoeia?
- If the adult dose is 60 mg and the age of child is 4 years what will be the dose for child according to Young' rule?
- What is Ostwald Ripening?
- Give a note on Flocculation.
- How to avoid Creaming in emulsion?
- Define Microemulsion.

- What is Zwitterion? Give Example.
- What is meant by Synergistic effect?
- What is the direction to be given while taking effervescent powders?
- Write about Pessaries.
- Define Prescription. Write a brief note on parts of the prescription and handling of prescription.
- What are Powders? Classify the powders with examples. Add a note on efflorescent powder.
- Define suppositories. Write about the suppository bases.
- Differences between Lotions and Liniments
- Write the formulas involved in the calculation of child dose.
- Give a brief note on Indian pharmacopoeia.
- Explain the methods to improve solubility of drugs.
- Write a brief note on various methods to prepare emulsion
- Give a brief note on Therapeutic Incompatibility 7. What are the Excipients used in semisolid dosage forms?
- Classify the dosage forms with examples.
- What are the various factors affecting Posology?
- Define Proof spirit.
- What is stokes law?
- Write about Pessaries.
- What are Geometric dilutions?
- Define Throat paints.
- What is displacement value?
- What are Gels?
- What is the role of emulsifying agent in emulsion formation? 9. What is meant by degree of flocculation 10. What are elixirs?

B.PHARM. DEGREE EXAMINATION
PCI PATTERN – SEMESTER V
PHARMACOGNOSY AND PHYTOCHEMISTRY – II

- Write a brief note on basic metabolic pathways leading to the formation of plant secondary metabolites.
- What are indole alkaloids containing drugs? Discuss about any one of them in detail.
- Explain the isolation of resin drug containing Anticancer Activity.
- Vinca.
- Bitter Almond.
- Artemisia.
- Ruta.
- Liquorice.
- Fennel.
- Catechu.
- Myrrh.
- Gentian.
- Give examples for secondary metabolites.
- Define Metabolic Pathway.
- Define electrophoresis.
- Write the principle of HPLC.
- Write the biological source and uses of Taxol.
- Mention the spray reagent used to detect alkaloids.
- Give examples for aldehyde containing volatile oil.
- Give the official source for Mentha oil and how it is isolated from it?
- Write the source for the four varieties of Aloes.
- Give examples for the tannin containing drugs.
- Summarize on Bio-synthesis and application of Digoxin.
- Describe in detail the collection, constituents with uses and chemical test of Opium.
- Explain the industrial production and utilization of Tropane alkaloids.
- Write a note on the industrial production of Forskolin.
- Write a note on Dioscorea rhizome.
- Illustrate the Pharmacognosy and chemistry of Rawolfia root.
- Write a note on collection, chemistry and uses of Taxus.
- Chromatographic techniques used in Plant drug analysis.
- Explain the term iridoids and give the pharmacognosy of Gentian.
- Illustrate the isolation and estimation of podophyllotoxin from its sources.
- Write a note on Fennel and Catechu.
- Outline the Isolation, Identification and Analysis of menthol.
- How will you identify caffeine in tea dust?
- What is Competitive feeding?
- What are carotenoids?
- Give the structure of Eugenol and Fenchone.

- Write the basic principles involved in chromatography.
- Mention the therapeutic use of Bitter almond
- Write the medicinal uses of Pterocarpus
- Mention the uses of sennosides
- Recall the drug used in cerebral malaria give its sources.
- Sketch the structure of glycyrrhetic acid.
- Describe in detail about the industrial production of Vincristine and Vinblastine.
- Discuss the method of collection of Benzoin, its constituents and uses.
- Briefly discuss about Biogenesis of various Isoprenoid Compounds.
- Shikmic Acid Pathway.
- Lignans.
- Cinnamon.
- Colophony.
- Carotenoids.
- Opium.
- Curcumin.
- Glycyrrhetic acid.
- Citral
- Pharmaceutical application of Forskolin.
- Write the biological source and uses of Taxus.
- Mention the source and constituents of Tea and Ruta.
- List out Various method of extraction of Volatile oils.
- Give the official source for podophyllotoxin and how it is commercially significant?
- Give the examples of phytoconstituents subjected to spectral analysis.
- Uses of Rauwolfia.
- Murexide Colour Reaction.
- Chemical Test for Guggul.
- Gambier-fluorescin Test.
- Discuss the method of extraction and the recent techniques of Isolation of phytoconstituents.
- Elaborate on Industrial production of Podophyllotoxin.
- Write briefly about the pharmacognosy of Digitalis.
- Rauwolfia.
- Tea.
- Dioscorea.
- Clove.
- Pterocarpus.
- Benzoin.
- Senna.
- Carotenoids.
- Super Critical Fluid Extraction.
- Write the use of Clevenger apparatus?
- Define the term extraction with examples.
- Name the alkaloids of Vinca.

- Write the Identification test for Atropine.
- Write the constituents and uses of Bitter almond.
- Outline the source and uses of Artemisia and Gentian.
- List out any two basic metabolic pathways.
- Define Autoradiography.
- Give the chemical test for Myrrh?
- Write the Principle of paper chromatography.

B.PHARM. DEGREE EXAMINATION
PCI PATTERN SEMESTER IV
PHARMACOGNOSY AND PHYTOCHEMISTRY Ⅲ I

- Explain about the various factors influencing the cultivation and collection of Crude drugs.
- Describe in detail about the nutritional requirements of Plant tissue culture.
- What are Glycosides? Classify them with suitable examples. Give any two tests for identification of glycosides.
- How will you evaluate crude drugs by physical methods?
- Give a note on chemotaxonomy.
- Discuss about the role of auxins and gibberellins in cultivation of a medicinal plant.
- Write a note on hybridization in medicinal plants.
- Edible vaccines.
- Describe the basic principle involved in Siddha system of medicine.
- Discuss about the properties and tests for identification of flavonoids.
- Gelatin.
- Differentiate absorbent and non absorbent cotton.
- Define Pharmacognosy.
- Stomatal number and stomatal index.
- List out the methods for drying crude drugs.
- Define plant tissue culture.
- Totipotency.
- Traditional systems of medicine.
- How will you perform the goldbeater's skin test?
- Give the biological source, family and uses of bees wax.
- Write a note on preparation of agar.
- What are Teratogens?
- Define the term Pharmacognosy. Write a detail notes on the history and scope of Pharmacognosy.
- Write an account on Plant hormones and their application in Pharmacognosy.
- Define the term Plant tissue culture. Write a detail notes on callus culture.
- Pharmacological classification of crude drugs.
- Chemical evaluation of crude drugs.
- Leaf constants.
- Role of Pharmacognosy in Siddha.
- Write a brief note on Glycosides.
- Cotton.
- Acacia.
- Flavonoids.
- Sources of drugs from animal origin.
- Alphabetical classification of crude drugs.
- Organoleptic evaluation.
- Polyploidy.
- Chemically undefined medium.
- Principles involved in Homeopathy.

- Chemical test for tannins.
- Hallucinogens.
- Streptokinase.
- Chemical test for Honey.
- Organized drugs.
- Define evaluation. What are the different methods of evaluation of crude drugs? Explain about organoleptic evaluation of crude drugs in detail.
- Describe the basic principles involved in Ayurveda System of Medicine.
- Define and classify fibres. Discuss in detail about cotton.
- Explain morphological classification of crude drugs with suitable examples.
- Discuss the sexual method of cultivation of crude drugs with its advantages and disadvantages.
- Write about mutation in medicinal plants.
- Give the historical developments of tissue culture.
- Embryo culture.
- Discuss about plant growth promoters used in tissue culture.
- What alkaloids? How are they classified? Give example for each group.
- Write a note on Flavonoids.
- Describe the anticancer agents from marine source.
- Differentiate between organized and unorganized drugs.
- Give two examples for drugs obtained from plant and animal source.
- Define grafting.
- Write about the micropropagation of plants.
- Give the importance of soils in cultivation of crude drugs.
- Hairy root culture.
- Sterilizing agents used in tissue culture.
- What are primary and secondary metabolites?
- Write about the role of proteolytic enzymes.
- Cuoxam test.
- Explain about chemical classification of crude drugs highlighting the advantages and disadvantages.
- Discuss about methods of cultivation of crude drug drugs from natural origin.
- Write about the theory and principles of Siddha system of medicine with emphasis on role in Pharmacognosy.
- Scope and development of Pharmacognosy.
- Plant hormones and their applications.
- Definition, classification, properties and identification test for Tannins.
- Natural allergens.
- Source, preparation, chemistry storage and uses of Gelatin.
- Novel medicinal agents from marine source.
- Nutritional requirements in plant tissue culture.
- Source, preparation, chemistry and commercial uses of Castor oil.
- Biological method of evaluation.
- Define Vein islet number and Veinlet termination number.

- Give two examples of animal drugs with source, family, chemical constituents and uses.
- Write the four types of stomata with examples for each.
- Give two precautions to be taken to store the crude drugs against oxidation.
- Define organized and unorganized drugs with examples.
- Give difference between gums and mucilage.
- Define Polyploidy.
- What is Cryopreservation?
- Write about ballooning effect in Cotton.
- Source, family, chemical constituents and uses of Bromelain.
- What are organized and unorganized drugs? Give suitable examples. Add a note on various sources of drugs with suitable examples.
- Describe in detail about the various methods of collection and drying of crude drugs.
- Discuss about the steps involved in establishment of a tissue culture in detail.
- Give a note on serotaxonomy.
- Discuss about the Lycopodium spore method and its significance.
- Polyploidy.
- Write a note on protoplast culture.
- Describe about the maintenance of suspension culture.
- Give the tests for identification of tannins.
- Volatile oils.
- Acacia.
- Discuss about the antimicrobial agents from marine source.
- Extractive values.
- Enumerate about the various methods used to control pests.
- Germplasm conservation technique.
- Define Explant.
- What are flavanoids? Give examples.
- Keller Killiani test.
- Write the basic principles of Homeopathy.
- Give the uses of bromelain.
- What are plant hallucinogens? Give examples.
- Give the Biological source, family and uses of Chaulmoogra oil.

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII
PHARMACOLOGICAL SCREEING METHODS

- Discuss the guidelines of OECD for the maintenance of Laboratory animals.
- List out various methods to evaluate anti-inflammatory agents and write briefly on Paw oedema model in rats.
- Write elaborately on Maximal Electroshock (MES) induced convulsion in rat.
- List out various Chemical Carcinogens used to induce cancer in animals. Add a note on DMBA (Dimethyl benzanthracene).
- Explain any one method for screening the Diuretics agents.
- Discuss briefly on various vehicles used for the preparation of drug solutions.
- What is Limulus Amebocyte Lysate (LAL) test. Discuss the methodology of LAL test.
- With suitable example, explain the chronic anti-inflammatory screening method.
- Mention various methods for screening Local Anesthetic agents and discuss a suitable method in the evaluation of infiltration anesthesia.
- Discuss the applications of biostatistics in experimental pharmacology.
- List out various in-vitro and in-vivo screening methods for anti-arrhythmic agents and briefly discuss any one method.
- What is Euthanasia? Add a note on inhalational anesthetics as euthanizing agents.
- Mention the two uses of Zebra Fish (*Danio rerio*) in experimental pharmacology.
- What is Sham Negative group in preclinical study?
- Mention the uses of mutant animals in drug screening.
- Mention the uses of Elevated plus maze in experimental pharmacology.
- Write the application of Langendroff's heart preparation.
- Name two Nootropic agents.
- Name two methods in the screening of anti-hypertensive agents.
- List out the methods in the breeding of laboratory animals.
- What is Lipschitz test?
- What is *in-vitro* screening method?

B.PHARM. DEGREE EXAMINATION

PCI PATTERN -SEMESTER IV

PHARMACOLOGY - I

- Define Pharmacokinetics & Pharmacodynamics. Write in detail about Parenteral routes of drug administration.
- Classify Anti-cholinergic drugs. Write the pharmacological actions, adverse effects and therapeutic uses of Atropine.
- Classify Anticonvulsant drugs. Discuss the mechanism of actions, adverse effects and uses of Phenytoin.
- Write a note on Tolerance.
- Brief the stages of general anaesthesia.
- Classify benzodiazepines. Write the mechanism of action and uses of benzodiazepines.
- Explain the pharmacology of opioid analgesics.
- Classify skeletal muscle relaxant. Describe the actions of non-depolarizing agents.
- Give the diagrammatic representation of Adrenergic neurohumoral transmission.
- Write a note on SSRIs.
- Write on the transducer mechanism in G- Protein coupled receptors.
- Define Parkinsonism. Write briefly on Bromocriptine.
- Give two examples of Animal source of drugs.
- What is prodrug? Give two examples.
- Define Teratogenicity and give two examples.
- Mention two uses of local anaesthesia.
- Define glaucoma and give two examples of anti-glaucoma drugs.
- Disulfiram reaction.
- Define hypnotics and give two examples.
- Two therapeutic uses of adrenaline.
- Name two antimanic drugs.
- Name two hallucinogens.
- Explain the fluid mosaic model of cell membrane. Write the mechanism of drug transportation via cell membrane.
- Narrate the pharmacological action of sympatholytics.
- Define and classify antidepressants. Explain the pharmacological action of Tricyclic antidepressant and SSRIs.
- Pharmacology of anticholinesterases.
- Steroid receptors.
- Write the mechanism of action and therapeutic application of adrenergic drugs.
- Pharmacovigilance.
- Teratogenicity.
- Volume of distribution.
- Enzyme induction and inhibition.
- Adverse drug reactions.
- Glaucoma.
- Drug allergy.

- Cholinergic receptor.
- Therapeutic index.
- Define lead optimization.
- Succinylcholine.
- MAOIs.
- GABA receptor.
- First pass metabolism.
- Post marketing surveillance.
- Disulfiram.
- Describe the various Factors of Modifying Drug Action.
- Classify Local Anaesthetics. Write the Therapeutic uses of Local Anaesthetics.
- Classify Anti-epileptics. Write the Pharmacological action of any one Antiepileptic.
- Write about the Regulation of Receptors.
- Write about the Signal transduction mechanism of receptors reactions.
- Write about adverse drug.
- Write the Pharmacokinetic Drug Interactions.
- Write the Clinical evaluation of new Drugs.
- Write the Organization and functions of the ANS.
- Write the Drugs used in Myasthenia gravis.
- Classify Antipsychotics.
- Write the Opioid Analgesics & Antagonists.
- Spare receptors.
- Addiction.
- Tachyphylaxis.
- Distribution.
- Enzyme inhibition.
- Glycine.
- Anti anxiety agents.
- Nootropics.
- Drug abuse.
- Dependence.
- Describe the Nature and Sources of Drugs.
- Classify the Parasympathomimetics and Parasympatholytics.
- Describe the General Anaesthetics and Preanaesthetics.
- Principles and Mechanisms of Drug Action.
- Drug Receptors Interactions.
- Ion Channel Receptor.
- Explain Adverse Drug reactions with examples.
- Write about the Drug Discovery.
- Write about the Pharmacovigilance.
- Classification and Therapeutic uses of Neuro muscular blockers.
- Write short Notes on Disulfiram.

- Drugs used in Parkinsons disease.
- Agonists.
- Tolerance.
- Idiosyncrasy.
- Membrane transport.
- Metabolism.
- Therapeutic index.
- Serotonin.
- CNS Stimulants.
- Anti-Manics.
- Drugs used in Alzheimer's disease.
- Explain different routes of Drug Administration.
- Classify Sympathomimetics and Sympatholytics.
- Classify Sedatives and Hypnotics. Write the Pharmacological action of any one Sedative & Hypnotic.
- Classify Receptors.
- Write about the JAK-STAT binding receptors.
- Write about the G-Protein Coupled Receptors.
- Write the Combined effects of drugs with examples.
- Write the Pharmacodynamic Drug interations.
- Write the different phases of Clinical Trials.
- Write the Neurohumoral Transmission and Neurotransmitters in the ANS.
- What is Glaucoma? Write the Drugs used in Glaucoma.
- Write about the Antidepressants.
- Antagonists.
- Dependence.
- Absorption.
- Excretion.
- Enzyme induction.
- Glutamate. 7. Dopamine.
- Hallucinogens.
- Drug addiction.
- Tolerance.

B.PHARM. DEGREE EXAMINATION
PCI PATTERN – SEMESTER V
PHARMACOLOGY – II

- Define and classify oral anti-diabetic drugs. Write the pharmacological actions, adverse effects and therapeutic uses of sulphonyl urea derivatives.
- Classify NSAIDs. Elaborate the mechanism of action, pharmacology, adverse effects and therapeutic uses of salicylates.
- Define Bio-assay. Classify it and write in detail about the bio-assay of digitalis.
- Write a note on substance P.
- Pharmacology of Digitalis.
- Briefly explain about the pharmacology of Furosemide.
- Add a note on Low molecular weight Heparin.
- Give the mechanism of action, adverse effects and therapeutic uses of organic nitrates.
- Write a brief note on Oral contraceptives.
- Pharmacology of Growth hormone inhibitors.
- Pharmacology and adverse effects of Enalapril.
- Classify anti-arrhythmic drugs. Give the Pharmacology of Quinidine.
- Define Haematinics. Give four examples.
- Define oxytocic. Give example.
- Two therapeutic uses of Atenolol.
- Give four drugs used as anticoagulants.
- Name two drugs to treat Goiter.
- List out four selective 5-HT antagonists.
- What are leukotrienes?
- Define shock. Classify it.
- Uses of osmotic diuretics.
- Define anaphylaxis and give the drug of choice to treat it.
- Define Autocoids .Write the pharmacological actions of Histamine and treatment of anaphylaxis.
- Classify antihypertensives. Elaborate the mechanism of action, pharmacology, adverse effects and therapeutic uses of calcium channel blockers.
- Define Bio-assay. Classify it and write in detail about the bio-assay of d-tubocurarine
- Write a note on Plasma volume expanders.
- Pharmacology and side effects of prednisolone.
- Classify antithyroid drugs. Briefly explain the pharmacology of propylthiouracil.
- Write a note on preparations of Insulin.
- Give the adverse effects and therapeutic uses of an anabolic steroid Nandrolone.
- Classify DMARDs and add a brief note on hydroxy chloroquine.
- Pharmacology of paracetamol and treatment of acute paracetamol poisoning.
- Pharmacology and adverse effects of Allopurinol.
- Define and Classify antihyperlipidemic drugs. List out various uses of it.
- Define thrombolytic agents. Give two examples.
- Define migraine. Give four drugs to treat migraine.
- Name the hormones acting on Uterus.

- Give two drugs to induce ovulation.
- Side effects of oestrogen therapy.
- List out four topical antiseptic containing Iodine.
- Major complications in chronic Diabetic mellitus.
- Define and Classify antianginal drugs.
- Uses of Carbonic anhydrase inhibitors.
- List out two hormones regulating calcium level.
- Define and classify antihistaminic drugs .Write the pharmacological actions, adverse effects and therapeutic uses of Chlorpheniramine maleate.
- Classify anti- arrhythmic drugs. Elaborate the mechanism of action, pharmacology, adverse effects and therapeutic uses of Quinidine.
- List out various oral anticoagulants. Write the pharmacological actions, adverse effects and therapeutic uses of Coumarin derivatives.
- Write a note on the Pharmacology and adverse effects of Atorvastatin.
- Bio assay of Insulin.
- Briefly explain the pharmacology of potassium sparing diuretics.
- Give the difference between Heparin and Low molecular weight Heparin.
- Give the mechanism of action, adverse effects and therapeutic uses of Nifedipine.
- Write a brief notes on prolactin inhibitors.
- Pharmacology of Calcitonin.
- Pharmacology and adverse effects of Biguanides.
- State various phases of cardiac potential.
- Adverse effects of Aspirin.
- Define anti-gout drugs. Give four examples.
- Two adverse effects of clonidine.
- Give four drugs used as anticoagulants.
- What is Urolithiasis? Give four examples of drugs to treat it.
- List out four prostoglandin antagonists.
- State the adverse effects of Heparin.
- Define cardiotonics. Give the therapeutic uses of it.
- Uses of HMG Co-A reductase inhibitors.
- Define vasodilators and give two examples.
- Define Anti-hyperlipidemics and classify them with examples. Explain in detail the mechanism of action, pharmacological action, side effects and uses of statins.
- Classify oral contraceptives with examples. Write its pharmacological actions, MAO, adverse effects and therapeutic uses.
- Define anticoagulants and its classification; explain in detail the mechanism of action, pharmacological action, side effects and uses of heparin.
- Insulin preparations.
- Anabolic steroids.
- Drugs used in congestive heart failure.
- Low Molecular Weight (LMWH) Heparin 5. Classify anti-histaminic agents.
- Leukotrienes.
- Classification of Antirheumatic drugs.

- Write on the Parathormone.
- Bioassay of histamine.
- Give two examples of phenylalanine analogues.
- Clinical uses of pituitary hormone.
- List out the adverse effects of glucocorticoids.
- Mention two uses of isosorbide mononitrate.
- Write the therapeutic uses of thyroid hormones synthesis inhibitors.
- Name two beta blockers.
- Give two examples of 5-HT antagonists.
- Two therapeutic uses of digitalis.
- Name two alpha glucosidase inhibitors drugs.
- Therapeutic use of Alteplase.

B. PHARMACY DEGREE EXAMINATION
PCI PATTERN SEMESTER - VI
PHARMACOLOGY III

- Classification of anti-tubercular drugs. Describe briefly the mechanism of action, adverse drug reaction and therapeutic uses of Isoniazid.
- Classify anti-emetic drugs. Write the mechanism of action, adverse effects and uses of prokinetic agents.
- Classify the Immuno suppressants. Write in detail about the mechanism of action, adverse effects and therapeutic uses of Cyclosporine.
- Types of monoclonal antibodies and its application.
- Mechanism of action and uses of beta lactamase inhibitors 3. Write a note on proton pump inhibitors.
- Enumerate newer macrolide antibiotics and its mechanism of action and uses.
- Give brief account on anti- Helicobacter pylori regimen.
- Write a note on drugs used in prophylaxis of malaria.
- What is cotrimoxazole? Give its therapeutic uses and mechanism of action.
- Write a note on natural anti cancer drugs.
- Write a note on Dimercaprol.
- Spectrum of action and uses of monobactam.
- Why antacid should not be given with sucralfate in the treatment of peptic ulcer disease.
- How does vancomycin produce “Red man syndrome”.
- Symptoms and treatment of Mercury poisoning.
- Circadian rhythm and its influence in Chrono therapeutics.
- Give examples for osmotic purgatives and their uses.
- Name two retroviral protease inhibitors.
- Mention the drugs for urinary tract infection.
- Adverse effect of Chloramphenicol.
- Example of drugs for treating candidiasis.
- Classify anti-asthmatic drugs. Write the mechanism of action, pharmacological action and therapeutic uses of Theophylline.
- Define anti-microbial agents, classify Penicillins. Explain the mechanism of action, adverse drug reaction and uses of Penicillin G.
- Classify the anti-malarial drugs. Write in detail about the mechanism of action, adverse effects and therapeutic uses of Chloroquine.
- Write a note on Expectorants
- Mechanism of action and uses of proton pump inhibitors
- Write a note on anti-diarrhoeal drugs
- Classify aminoglycoside antibiotics. Write adverse effects and therapeutic uses of Gentamicin.
- Mechanism of action and therapeutic uses of fluoroquinolones.
- Explain treatment regimens in Tuberculosis.
- Mechanism of action of antimetabolites.
- Write a note on Immuno suppressants.

- General principles in the treatment of poisoning
- Give examples of saline purgatives
- Define carminatives and its uses.
- Comment the usefulness of corticosteroid in autoimmune disorders.
- Define the term carcinogenicity
- Name two appetite stimulants 6. Give examples of antitussive agents
- Enumerate two anthelmintic drugs.
- Mention the drugs for herpes zoster infection.
- What should be avoided when taking Tetracycline?
- Microtubule damaging anti-cancer drugs
- Classify anti-ulcer drugs. Write the pharmacological action, mechanism of action and uses of H₂ receptor antagonist.
- Classify Cephalosporin. Write the mechanism of action, adverse effects and uses of third generation cephalosporin drugs.
- Discuss in detail about the classification of anti-cancer drugs. Write the mechanism of action, adverse drug reaction and uses of alkylating agents.
- Give brief account on Griseofulvin.
- Mechanism of action, drug interaction and uses of streptomycin.
- Classify the drugs used in the therapy of constipation and add a note on mechanism of action.
- Classify anti-retro viral drugs. Write adverse effects and therapeutic uses of zidovudine.
- Write a note on Diloxanide furoate.
- Write short notes on Artemisinin derivatives.
- Mechanism of action and uses of sulphamethaxazole.
- Classify heavy metals poisoning and its antagonist.
- Define Biological clock and its significance.
- Name two Mast cell stabilizers.
- Mention the non-systemic antacids which neutralize the gastric acid secretion.
- Define Teratogenicity and give two examples of drug causing teratogenicity.
- Example for drugs used in the management of emesis.
- Why is clofazimine used as a component of multidrug therapy in leprosy?
- Name two antifungal antibiotics.
- Therapeutic uses of Metronidazole.
- Mention any two drugs for urinary tract infection.
- Rationale of using Levamisole as immunostimulant.
- Common adverse drug reaction associated with the use of anticancer drugs.
- Classify anti-asthmatic drugs. Write the pharmacological actions, ADR and therapeutic uses of selective Beta2 (β₂)-agonists.
- Classify Anti-ulcer agents. Write the pharmacological actions, adverse effects and therapeutic uses of proton pump inhibitors.
- Classify Anti-neoplastic agents. Discuss the Mechanism of action, adverse drug reaction, therapeutics uses of alkylating agents.
- Mast cell stabilizers.
- Define and classify Laxatives. Mention its uses. Discuss the mechanism of Bulk and Stimulant Purgatives.

- 5HT₃ antagonists.
- Anti-leprotic drugs.
- Cyclosporine
- Signs and treatment of Arsenic poisoning.
- Cotrimoxazole
- Write short notes on protease inhibitors.
- Write a note on chemotherapy of Sexually Transmitted Diseases
- What is status asthmaticus? Site the drug of choice?
- Name two mucolytics.
- Define prokinetics with examples.
- Name two appetite stimulants.
- Examples for Beta lactamase inhibitor.
- List out the toxicities of Aminoglycoside antibiotics.
- Comment the usefulness of Sulfasalazine in inflammatory bowel disease.
- Side effects of Metronidazole.
- Chronotherapy.
- What is the antidote for lead poisoning?

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII
PAPER V - PHARMACOVIGILANCE

- Explain the Working Group XII and XI objectives.
- Explain the criteria for Drug safety evaluation in Paediatric population. 3.
Methods for Causality, Severity and Seriousness Assessment of ADRs.
- Various types of Drug Information Resources.
- Explain the Post Marketing Trials.
- Why CIOMS are important within Pharmacovigilance Work.
- Pharmacovigilance Planning.
- Eudravigilance.
- Why Pharmacovigilance is needed?
- Safety Data Management.
- Effective communication in Pharmacovigilance.
- Describe in details CDSCO in India.
- Classification of Adverse events following immunization.
- Derived classification.
- Harmonization.
- Common technical document.
- Elements of the Specification.
- Types of services provided by CROs.
- ICH Steering Committee.
- Registries.
- Good Pharmacovigilance Practice.
- Genomic approaches to serious adverse drug reactions.

B. PHARMACY DEGREE EXAMINATION
PCI PATTERN SEMESTER - VII
PHARMACY PRACTICE

- Discuss the various drug distribution methods for the inpatients & outpatients with their advantages and disadvantages.
- Write the purchase procedure followed in hospital and explain about modern technique used in inventory control in hospital pharmacy.
- Define patient counseling and discuss about the steps and barriers involved in patient counseling.
- Define and classify the Adverse Drug Reaction.
- Explain the significance of hospital formulary.
- Describe the Drug Information Centre in hospital and its function.
- Write about role of hospital pharmacist in community health education.
- Short notes on Over The Counter drugs (OTC).
- Brief note on pharmacy and therapeutic committee.
- Explain about budget preparation and implementation.
- Define hospital pharmacy and discuss the function and objective of hospital pharmacy.
- Write about types of ward round.
- What is proprietary medicine?
- Define Lead time.
- Define and classify the hospital.
- Define Pharmacovigilance.
- Write any two name of Health care software.
- What is coding? Mention different coding methods in medicine management.
- Write full form of CUDD, DUDD and explain.
- What is verbal and non-verbal communication order?
- Write any two examples for pharmacokinetic drug interaction.
- Example for control drugs.
- Detailed note on organization and structure of hospital pharmacy and responsibilities of hospital pharmacist.
- What is Therapeutic drug monitoring (TDM)? Discuss various factors which influence the TDM.
- Define hospital formulary. Explain the method of preparation of hospital formulary.
- Explain drug distribution system in hospital for inpatient.
- Define hospital. What are the functions of hospital?
- a) Idiosyncrasy b) Drug intolerance c) Teratogenicity d) Drug allergy.
- Add a note on Patient Counseling.
- a) ABC analysis b) EOQ analysis.
- Give review on hematology.
- Short notes on Over The Counter drugs (OTC).
- Brief note on Pharmacovigilance.
- Role of pharmacist in educational and training program.
- Define and classify the ADR.
- Define MEDLINE, MEDLAR.
- Automatic Stop Order (ASO).
- Write types of outpatients.

- What is medication adherence?
- What is coding. Write any two advantages of coding in medicine management.
- Write full form of FIFO, FEFO and explain.
- What are income accounts?
- Write any two examples for beneficial drug interaction.
- Define community pharmacy.

B.PHARM. DEGREE EXAMINATION
PCI PATTERN SEMESTER III
PHYSICAL PHARMACEUTICS ⅢI

- Explain briefly on distribution law and its limitations.
- Explain the term surface tension & interfacial phenomena. Write the different methods used to measure surface tensions. Explain any two methods elaborately.
- Explain various methods to analysis complexes.
- Diffusion principles in biological systems.
- Principle behind the working of aerosols.
- Difference between amorphous & crystalline solids.
- How the solubility of partially miscible liquids occurs and explains with one example?
- Different types of adsorption isotherms.
- How micellar system solubilize the poorly soluble drugs?
- Significance of protein binding.
- Various methods to determine pH.
- Methods to adjust isotonicity.
- Define spreading co-efficient.
- Henry's law-define with equation.
- HLB scale.
- What do you mean by binary solution and give example?
- Examples of pharmaceutical buffers.
- What is the nature of solvent and cosolvent and give examples?
- pH equation for acid and alkali.
- Examples for biological buffers.
- Write the different between hypotonic and hypertonic solution.
- Write the equation for Fick's law of diffusion.
- Define complexes. Classify the complexes with suitable examples. Write about the inclusion complexes.
- Explain the Freundlich and Langmuir adsorption isotherm.
- Define surfactants. Explain classification of surfactants with suitable examples.
- Significance of protein binding.
- Describe with examples of polar, non polar and semi polar solvents.
- Crystalline structure of complexes.
- Wilhelmy plate method.
- Liquid crystalline state and Supercritical fluids.
- Dielectric constant and Dipole movement.
- Application of buffers in pharmaceutical and biological system.
- Vapour pressure and Liquid crystals.
- Application of surface active agent.
- Buffer equation.
- Surface free energy.
- Ideal solution.
- Common ion effect.
- Olefin complexes.
- Latent Heat.
- Sublimation.
- Critical solution temperature.

- Distribution law.
- Mechanism action of detergent.
- Enumerate the methods for analysis of complexes and explain in detail about solubility method.
- Explain the phase rule for one and two component systems.
- Define solubility. Describe solubility expression. Write the factors influencing solubility of drugs.
- Explain Du - nouy ring method.
- Eutectic mixtures.
- Wetting phenomena and its applications.
- Solvation and Association.
- Write note on Protein binding of drugs.
- Job's method of Complexation.
- Sorensen's pH scale.
- Mechanisms of solute solvent interactions.
- Describe methods to adjust Tonicity.
- Raoult's law.
- Buffer capacity.
- Vaporization.
- Isotonic solution.
- Ferrocene.
- Spreading co-efficient.
- Critical micelle concentration.
- Liquid complex.
- Real solution.
- Henry's Law.
- Classify Complexes. Explain organic molecular complexes and inclusion Complexes.
- What are the various methods of determination of surface tension of Liquids? Explain any two methods.
- Explain briefly Freundlich and Langmuir adsorption Isotherms.
- Solubility expressions.
- Discuss Crystalline state of matter.
- Critical solution temperature of Phenol-water system.
- Describe application of Buffers.
- The pH titration method for studying Complexation.
- HLB scale and its significance.
- Eutectic Mixtures.
- Aerosols.
- Surface active agents and their pharmaceutical applications.
- Define surface tension.
- Distinguish between adsorption and absorption.
- Define Optical rotation.
- Define Dielectric constant.
- What are Isotonic solutions?
- Define Critical Micelle Concentration.
- Sorensen's pH scale.
- Define Refractive index.

- Polymorphism.
- Define relative humidity.
- Explain briefly about the various factors influencing solubility of Drugs.
- Describe briefly about the various classification of Complexation with examples.
- Define Isotonic solutions and explain the methods to determine the tonicity of solutions.
- HLB Scale.
- Dielectric constant & dipole moment.
- Eutectic mixtures.
- Crystalline solids.
- Spreading coefficient.
- Relative humidity and latent heat.
- Sorensen's pH scale.
- Buffers in pharmaceutical & biological systems.
- Define Vapour pressure and how the total Vapour pressures of liquid mixtures are measured?
- Define surface tension & interfacial tension.
- Raoult's law.
- Classification of surfactants.
- Distribution law.
- Define Amorphous & Polymorphism.
- Equation to determine distribution coefficient.
- BET equation.
- CMC.
- CST- definition and application.
- What is buffer capacity?
- Discuss a descriptive note on pH determination methods.
- Give a brief review on surface active agents.
- Write a note on factors influencing solubility of drugs.
- Explain about Azeotropic mixtures.
- Differentiate between crystalline and amorphous solids.
- Discuss ideal gas equation.
- Write a note on Polymorphism.
- Briefly write a note on HLB system.
- Applications of complexes in pharmacy.
- Write a note on factors affecting protein drug binding.
- Write short notes on buffers in biological system.
- Explain two methods of measuring tonicity.
- What is phase rule?
- Define critical solution temperature.
- Define partition coefficient.
- Define latent heat.
- Refractive index.
- Dielectric constant.
- Spreading coefficient.
- Chelates.
- Write the methods of analysis of Complexation.

- Examples of Pharmaceutical buffers.

B.PHARM. DEGREE EXAMINATION
PCI PATTERN SEMESTER IV
PHYSICAL PHARMACEUTICS -II

- Define and classify Colloids with suitable examples. Discuss their electrical properties.
- Explain objectives, procedures and limitations of accelerated stability testing.
- Describe the various types of rheological systems with suitable rheogram and examples.
- Differentiate flocculated suspension from deflocculated suspension.
- Discuss Sedimentation technique that used for particle size analysis.
- Describe the derived properties of powders.
- Derive first order rate constant.
- Describe Cup and Bop viscometer.
- Classify emulsifying agents with examples.
- Explain the stability of colloids by DLVO theory.
- Write a note on electrical double layer in colloids.
- Write a note on factors influencing the chemical degradation of pharmaceutical product.
- Thixotropy.
- Glidants with examples.
- Half-life.
- Bulges and spurs.
- Protective colloids.
- Heckel equation.
- BET equation.
- Coacervation.
- HLB scale.
- Particle size distribution.
- Describe the factors influencing the chemical degradation of pharmaceutical products.
- Explain the methods to determine particle size.
- What are suspensions? Describe formulation of suspensions. Add notes on theory of sedimentation.
- Instabilities of emulsion.
- Pharmaceutical application of colloids.
- Non-Newtonian system.
- Decomposition and stabilization of drugs.
- Dilatant flow.
- Cone and Plate viscometer.
- Rate and order of reaction.
- Air permeability technique for measurement of specific surface.
- Determination of half-life and Shelf life of a drug.
- Coalescence and breaking.
- Plastic flow.
- Critical micelle concentration.
- Kinematic viscosity.
- Zeta potential.
- Specific rate constant.

- Hydrolysis.
- Peptization.
- Accelerated stability testing.
- Micromeritics.
- Explain about formulation of suspensions.
- Summarize the derived properties of powders.
- Explain briefly on degradation and stabilization study of medicinal agents.
- Explain the electrical method to determine particle volume.
- Discuss about instabilities of emulsion.
- What is thixotrophy? Explain thixotropic behavior in formulations.
- Discuss the methodology and limitations of accelerated stability testing.
- Define colloid. Classify colloids with suitable examples.
- Describe about multipoint viscometers.
- Explain about micro emulsion.
- Define specific surface. Describe about fisher's subsieve sizer.
- Explain about donnan membrane effect.
- Write about rheopexy.
- What is Bancroft's Rule?
- Define shelf life.
- What is protective colloid? Give any two examples.
- Write any two applications of micromeritics in pharmacy.
- Define pseudo zero order reaction with example.
- Projected diameter and stoke's diameter.
- Define multiple emulsion.
- Define yield value in plastic system.
- State any two applications of colloids.
- Explain the various theories of emulsification.
- What is meant by Rheology? Explain shear thickening and shear thinning with suitable examples.
- Describe the electrical properties of colloids.
- Discuss preservation of emulsions.
- Compare and contrast lyophilic and lyophobic colloids.
- Explain the various methods for determination of order of a reaction.
- Describe the microscopic method for the determination of particle size and size distribution.
- Give an account of applications of rheology in pharmacy.
- Describe controlled flocculation.
- Explain the factors influencing rate of reaction.
- Describe the principle and working procedure involved in cup and bob viscometer.
- Explain the term micromeritics and its significance in pharmacy.
- Define order of reaction.
- Explain the term thixotrophy.
- Define angle of repose.
- Stoke's law.

- What is kraft and cloud point?
- Overages.
- Define Brownian motion.
- Bulkiness.
- Define emulsifying agent and give examples.
- Newton's law of flow.
- Define colloids. Discuss their electrical properties of colloidal system.
- Explain the objectives, procedure and limitations of accelerated stability studies.
- Differentiate Newtonian and non-Newtonian fluids with examples.
- Stability of suspension with sedimentation parameters.
- Write about instability of emulsion.
- Discuss the application of Micromeritics.
- Explain the concept of Thixotropy.
- Cone and Plate viscometer.
- Decomposition and stabilization of drugs.
- Nernst and Zeta potential.
- Protective colloids.
- Write about air permeability technique for measurement of surface area.
- Multiple Emulsion.
- Micellar Solubilization.
- Bancroft rule.
- Tyndall effect.
- Viscosity.
- Rheopexy.
- Edmundson equation.
- Angle Repose.
- Half life.
- Define rate of reactions.

**B. PHARMACY DEGREE EXAMINATION
PCI PATTERN SEMESTER - VI
QUALITY ASSURANCE**

- Discuss the concept Quality by design. What are various elements and tools required for the same?
- Discuss the concept, general provisions and protocols of GLP with reference to a nonclinical laboratory study.
- What is good warehousing practices? Describe briefly material management in a warehouse.
- Elements and philosophies of total quality management.
- General principles of analytical method validation.
- Brief overview of QSEM.
- Purchase specifications and maintenance of stores for raw materials.
- Quality control test for rubber closures.
- Plant layout of pharmaceutical industry.
- Quality review and quality documentation.
- Batch formula records.
- Benefits and elements of ISO 9000 and ISO 14000.
- Principles of NABL Accreditation.
- Master formula records.
- Purpose of ICH guidelines.
- Concept of GMP.
- Quality audit.
- Handling of return good.
- Records and reports.
- SOP.
- Purchase specifications.
- Validation master plan.
- What is the concept of TQM, describe in details various elements required for management of quality in pharmaceutical industry.
- Explain the quality control tests for containers, rubber closures and secondary packing materials.
- Compare calibration, qualification and validation. How do you prepare validation master plan? Describe calibration of UV-visible spectrophotometer.
- ICH stability testing guidelines.
- Describe the principle of NABL accreditations.
- Write details on GMP with respect to sanitation and hygiene.
- Signification of equipment validation.
- GLP for test and control articles.
- Disqualification of testing facilities.
- Complaints and evaluation of complaints.
- Master formula record.
- General principles of analytical method validation.
- SOP.

- Batch formula records.
- Waste disposal.
- Concept of quality control.
- Non clinical laboratory.
- Tools and elements of Qbd.
- Good warehousing practice.
- Benefits of ISO 14000.
- Quality managements.
- General provision of GLP.
- Describe the design, construction and plant layout of Pharmaceutical Industry.
- How complaints should be handled according to the GMP provisions? Elaborate recalling and handling of return goods.
- What are the general principles of analytical method development? Compare accuracy and precision of LOD and LOQ with reference to ICH guidelines.
- QSEM with special emphasis on Q-series guidelines.
- Compare calibration, qualification and validation.
- Testing facilities operation and disqualifying of testing facilities.
- Explain quality Audit.
- Compare the concept of QA and QC as per GMP.
- What are the general provisions of good laboratory practices?
- How do you conduct a nonclinical laboratory study?
- Quality control test for secondary packing materials.
- Good warehousing practices.
- Concept of quality assurance.
- Elements of TQM.
- Personal records.
- Control of contamination.
- Quality review.
- Overview of Qbd.
- Evaluation of complaints.
- Distribution records.
- Materials management.
- Calibration of pH meter.
- (a)Describe the process of harmonization of ICH guidelines. (b) Explain the ICH stability testing guidelines.
- Discuss the responsibilities, training and hygiene of personnel.
- Explain the importance and types of validation.
- Give the general principles of analytical method validation
- Explain the elements of quality by design program.
- Discuss about equipment selection and purchase specifications.
- Give a brief account of product recall.
- Write a note on validation master plan.
- Explain the good warehousing practices.

- Write a note on batch formula record.
- Discuss the protocol for conduct of a nonclinical laboratory study.
- Explain the principles and procedures involved in NABL accreditation.
- Discuss the quality control tests for glass container
- Quality assurance
- Roles of head of production department
- Standard operating procedure
- Materials management
- Control of contamination
- Secondary packing materials
- ISO 9000
- Quality audit
- Waste disposal
- Control articles

**B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII**

QUALITY CONTROL AND STANDARDIZATION OF HERBALS

- Describe the guidelines on GACP for medicinal plants.
- Explain the quality control of herbal drugs as per WHO guidelines.
- Enumerate the regulatory requirement of herbal drugs.
- Explain the various herbal pharmacopoeias.
- Write the GMP requirement for herbal medicine.
- Explain the preparation of document for new drug application.
- Discuss the protocol for clinical guidelines in herbal medicine.
- Enumerate various aspects of GLP.
- Write the applications of chromatography technique its standardization of herbal drugs.
- Write briefly about stability studies of herbal medicinal products.
- Describe the basic test for medicinal plant materials.
- Write a note on research guidelines for evaluating safety and efficacy of herbal medicine.
- Natural pesticide.
- Difference between TLC & HPTLC.
- Types of markers with examples.
- Extractive value and its significance.
- Define SOP.
- What is AYUSH?
- Examples of herbal drug interaction.
- Significance of ICH.
- Define term herbal medicine & crude drug.
- Quantitative microscopy.

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII
SOCIAL AND PREVENTIVE PHARMACY

- Discuss about the National Health Intervention Programme for Mother.
- Explain in detail about Integrated disease surveillance programme.
- Elaborate on Pulse Polio Programme.
- Dengue.
- Concept of Prevention and control of disease.
- Food in relation to nutrition & health.
- National urban health mission.
- AIDS control programme.
- Cancer.
- National Tobacco Control Programme.
- Cholera.
- Universal immunization programme.
- Define Health.
- Function of PHC.
- School Health.
- Nutritional Deficiencies.
- Control of deafness.
- Pneumonia.
- Define drug dependency.
- Objectives of blindness control programme.
- Avoidable habits.
- SARS.

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII
ADVANCED INSTRUMENTATION TECHNIQUES

- Explain the working principle and construction involved in GC-MS/MS.
- Discuss the Different types of Analysers used in mass spectroscopy.
- Write the principle and instrumentation of DTA with a neat diagram.
- Explain the Relaxation process in NMR.
- Write the Calibration procedure for flame photometer.
- Explain about ICH guidelines used in method validation parameters.
- Write the short notes on Applications in SPE.
- Discuss the Chemical shift in NMR.
- Explain the fragmentation rules in mass spectroscopy briefly.
- Write the Calibration procedure for IR spectroscopy.
- Explain the instrumentation of HPTLC-MS.
- Explain the factors affecting DSC curve.
- Ring rule.
- Parent ion.
- Define calorimetry.
- LOD and LOQ.
- Long term Stability.
- Accuracy and Precision.
- Prospective validation.
- Give any two differences between Calibration and validation.
- Define Chemical ionization.
- Give any two advantages of fast-atom-bombardment interface.

● **B.PHARM. DEGREE EXAMINATION PCI REGULATION – SEMESTER II FIRST YEAR BIOCHEMISTRY**

- Describe the beta oxidation of fatty acids with energetics.
- Explain Hexose monophosphate shunt pathway and add a note on its metabolic significance.
- Discuss about semiconservative replication of DNA.
- Explain the mechanism of enzyme action.
- Summarise ketogenesis.
- Define and classify carbohydrate.
- Describe urea cycle and its metabolic disorders.
- Briefly explain Transcription.
- Discuss the diagnostic applications of isoenzymes.
- Describe Adenosine triphosphate as an energy rich compound.
- Explain any two disorders of lipid metabolism.
- Explain coenzymes.
- Define gluconeogenesis.
- Define hyperbilirubinemia.
- What is Michaelis-Menten equation?
- Name the bile salts.
- Define transamination.
- What is mutarotation?
- Write any two functions of nucleic acids.
- What is isoenzyme?
- What is Albinism?
- Name the bases present in DNA.
- Describe protein synthesis and its inhibitors.
- Explain De novo synthesis of fatty acids.
- Discuss about gluconeogenesis.
- Enumerate the IUB classification of enzymes.
- Summarise glycogenolysis.
- Outline the biosynthesis of pyrimidine nucleotides.
- Describe catabolism of aminoacids.
- Briefly explain organization of mammalian genome.
- Explain Jaundice and its types.
- Describe the relationship between free energy, enthalpy and entropy.
- Explain Alkaptonuria and Phenylketonuria.
- Define and classify lipids.
- Define enthalpy and entropy.
- Write the energetic for glycolysis pathway.
- Enlist uncouplers in oxidative phosphorylation.
- What is fatty liver?
- Write the conversion of phenylalanine to tyrosine.
- What is hyperuricemia?
- What is transcription?

- What is enzyme induction and repression?
- What is ketoacidosis?
- Name essential aminoacids.
- Describe transamination and deamination reactions with suitable examples.
- Explain Embden Meyerhof pathway and write its significance.
- How genetic code is used for amino acid coding and explain with wobbles hypothesis?
- Discuss and detail about the Redox potential.
- What are phospholipids? Describe the classification and functions of any two Phospholipids.
- Synthesis and significance of Melatonin.
- Explain Hyperbilirubinemia and Jaundice.
- Bio-synthesis of De-novo pathway of purine and explain any one metabolic disorder of purine.
- Explain Enzyme kinetics with Michaelis plot.
- Explain allosteric enzymes regulation.
- Hexose Monophosphate pathway.
- Explain the conversion of cholesterol into steroid hormones and write its significance.
- What is Atherosclerosis?
- Define Bio molecules.
- Diabetes Mellitus.
- What are exergonic reaction?
- What is cellular respiration?
- What is albinism?
- Differentiation mRNA & tRNA.
- Define coenzymes.
- Creatinine.
- Lipoprotein.
- Explain the De novo synthesis of Palmitic acid.
- Define Oxidative Phosphorylation. What is the cellular site of Oxidative phosphorylation?
- Explain the steps involved in Biosynthesis of Nucleotide.
- Write a note on the Pathway of synthesis Catecholamines.
- Describe Urea Cycle.
- Explain Inhibitors of Protein synthesis.
- Write short note on NAD^+ and NADP^+ .
- Heme.
- Write the conversion of cholesterol to Vitamin D3.
- Explain Bioenergetics and concept of free energy.
- Explain in detail about the clinical significance of Isoenzymes.
- What are Glycolipids? Explain with suitable examples.
- Explain Endergonic reactions. 2. Write the significance of ATP.
- Hypercholesterolemia.
- Ketone bodies.
- Alkaptonuria.
- Gout.

- What are essential fatty acids?
- Define codons.
- Define lysosomes.
- Write the therapeutic applications of enzymes.
- Explain the process of glycogen breakdown pathway.
- Describe the citric acid cycle with energetic.
- Explain the metabolic pathway of phenylalanine and Tyrosine.
- RNA
- Explain the coenzymes involving oxidation – reduction reaction.
- Lipoproteins.
- Describe the Michaelis – Menten equation.
- Explain about glycogen storage diseases.
- Fatty liver.
- Biosynthesis of Purine nucleotides.
- Electron transport chain.
- Jaundice.
- Albinism.
- Hypercholesterolemia.
- Define metabolism.
- What is the significance of HMP shunt?
- What is genome?
- Atherosclerosis.
- Give any two differences between DNA and RNA.
- Isoenzymes.
- Ketone bodies.
- FMN.
- Describe the Hexose Monophosphate shunt pathway and add a note on metabolic significance.
- Briefly discuss the composition of DNA with a suitable diagram.
- Discuss the reactions of gluconeogenesis.
- Translation
- Write down the reaction of β -oxidation.
- Structure of t-RNA.
- Classify the proteins with suitable examples.
- Adenosine Triphosphate (ATP) 6. Clinical applications of enzymes.
- Explain glycogenolysis.
- Diabetes mellitus.
- Classification and nomenclature of enzymes.
- Name sulphur containing amino acids.
- Transcription.
- Classification of amino acids.
- Functions of Cyclic AMP.
- Urea cycle.
- Ketogenesis.

- Genetic code.
- Functions of Nor Adrenaline and Adrenaline.
- Oxidative Phosphorylation.
- Biosynthesis of Pyrimidine nucleotide.
- Deamination.
- Fatty liver.
- cAMP.
- Oxidative phosphorylation.
- Alkaptonuria.
- Gout.
- Ketosis.
- What is Nucleotide? Give example.
- Role of Carnitine.
- Describe the beta oxidation of fatty acids. Write the energetic for palmitic acid oxidation.
- Describe in detail about Glycolysis with energetics.
- Define enzyme and discuss the various types of enzyme inhibition with suitable examples.
- Define coenzymes and give examples.
- Define gluconeogenesis and glycogenesis.
- Obesity.
- Define hyperbilirubinemia.
- Essential Amino Acids.
- Phenylketonuria.
- Functions of cholesterol.
- Hyperuricemia.
- What is Nucleoside? Give example.
- Transamination.

B. PHARMACY DEGREE EXAMINATION
PCI PATTERN SEMESTER - VI
BIOPHARMACEUTICS AND PHARMACOKINETICS

- Write about the pharmaceutical factors influencing drug absorption.
- Discuss the method of measuring of bioavailability.
- Give brief summary on Michaelis - Menton equation.
- Write the factors affecting protein drug binding.
- Explain the clearance.
- Explain the one compartment model following intravenous injection.
- Pharmacokinetic model.
- Explain steady state drug level.
- Explain two compartment model.
- Explain factors causing non linearity.
- Method to enhance the bioavailability of poorly soluble drugs.
- Bio equivalence studies.
- Active diffusion.
- Process of Biliary excretion of drug 3. Biotransformation
- Dissolution.
- Pharmacokinetics.
- Loading dose.
- Absorption.
- Absolute bioavailability.
- Clearance.
- Clinical significance of protein binding.

- Explain physicochemical factors influencing drug absorption through Gastro Intestinal Tract (GIT).
- Explain one compartment model following extra vascular administration.
- Discuss different methods used in bioequivalence studies.
- Explain tissue permeability of drugs in details.
- Write about clinical significance of protein binding of drugs.
- Write a detail about the phase II reaction of metabolism.
- Factors affecting drug metabolism.
- Factors affecting excretion of drug.
- Determination of bioavailability.
- Types of pharmacokinetic model.
- Two compartment open model.
- Non linear pharmacokinetics.
- Endocytosis.
- Apparent volume of drug distribution.
- Renal clearance.
- First pass metabolism.
- Intravenous infusion.

- Multi dose.
- Metabolism.
- One compartment open model.
- Non renal route of drug excretion.
- Bio pharmaceuticals.
- Discuss the mechanism of drug absorption through Gastro Intestinal Tract (GIT).
- Give brief summary on kinetics of multiple dosing.
- Discuss about factors affecting drug metabolism.
- Explain apparent volume of drug distribution.
- Write about kinetic of protein binding.
- Method enhances the dissolution rate.
- Plasma and tissue protein binding drug.
- Non compartment model.
- *Invitro* and *Invivo* correlation.
- Factors causing non linearity.
- Steady state drug level.
- One compartment open model for intravenous infusion.
- Mention the pharmaceutical formulation factors.
- Factors affecting protein drug binding.
- Testing of kidney function.
- Bioequivalence.
- Bioavailability.
- Application of pharmacokinetics.
- Difference between linear and non linear.
- Elimination.
- Two compartment model.
- Total body clearance.
- Explain the pharmaceutical factors influencing the absorption of drug through GIT with examples.
- Explain the Michaelis - Menton method of estimating parameters.
- Explain the methods to enhance the dissolution rate and bioavailability of poorly soluble drugs.
- Explain the Clinical significance of protein binding of drugs.
- Explain the Non renal routes of drug excretion of drugs
- Bioequivalence studies
- Explain the steady state drug levels and calculation of loading doses.
- Explain the Factors causing Non-linearity.
- Explain the elimination rate constant.
- Explain the physiological models
- Explain the Non compartment models
- Methods of assessment of bioavailability
- Tissue Permeability.
- What is relative bioavailability
- What is apparent volume of distribution

- Renal clearance
- Any two phase II reactions
- In-vitro-in-vivo correlations
- AUC
- Steady state concentration
- MRT
- Maintenance dose

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII
BIOSTATISTICS AND RESEARCH METHODOLOGY

- Discuss the protocol for an experimental study design.
- Describe the different measures of central tendency.
- How is QbD based product development better? Explain the steps involved in it.
- Explain correlation, types of correlation and its applications.
- Discuss different methods of sampling.
- Explain null hypothesis, type I and type II errors.
- Explain types of observational study designs.
- Explain with examples- Histogram, Pie chart.
- Discuss the applications of SPSS and MINITAB in data analysis.
- Explain the concept of Central Composite Design.
- Classify and explain different types of t- tests.
- Explain ANOVA and its applications.
- Report writing in research study.
- Confidence interval.
- Chi square test.
- Probability.
- Standard error of mean.
- 2^2 and 2^3 designs.
- Applications of nonparametric tests.
- Degrees of freedom.
- Differentiate SD and SEM.
- Define scatter plots.

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII
CELL AND MOLECULAR BIOLOGY

- What is gene transfer? Discuss various methods for gene transfer in animal.
- Define Receptor? Explain in detail about molecular pathway of GPCR.
- Explain in detail about Protein synthesis in eukaryotes.

- Write in detail about structure and function of mitochondria.
- Write short note on ribosomal RNA and micro RNA.
- Explain in detail about replication DNA.
- Write the functions of the following a. Centromere b. Cell wall.
- JAK-STAT pathways.
- Write a note on Kinase enzyme linked receptor.
- Write short note on Autosomes and Sex chromosome.
- Write the difference between eukaryotes and prokaryotes.
- Give short note on different phases of cell cycle and Check points.

- Monoclonal antibodies.
- Meiosis.
- Amino acid.
- Types of cell signals.
- Gel electrophoresis.
- Tyrosine kinase receptor.
- Telophase.
- Cyclic AMP and GMP.
- Plasmid.
- Endoplasmic reticulum.

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII
COMPUTER AIDED DRUG DESIGN

- Elaborate the stages of *Denovo* drug design.
- Explain Random and Non-random screening methods.
- Explain the Bioisosteric replacement strategies with ring replacement.
- Tafts steric constant (Es).
- Discuss Clinical studies with the phases of clinical trials.
- What is Bioisosterism? Classify them with examples.
- Illustrate Linear Hansch model.
- Explain Free-Wilson approach.
- Applications of Pharmacophore.
- Write a brief note on Flexible Docking.
- ADME and biochemical Databases.
- Explain Energy minimization method-non derivative method.
- Rigid Docking.
- Analog design and its goals.
- What is COMFA?
- Verloop Steric Parameter.
- SAR Vs QSAR.
- What is Partition Coefficient?
- Post marketing monitoring.
- *Invitro*, *Invivo* and *Silico* assays.
- Structure of Isoniazid and Chloramphenicol.
- Structure based virtual screening.

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)

PCI PATTERN SEMESTER VIII COSMETIC SCIENCE

- Explain briefly about the problems associated with skin and skin care products.
- Mention the active substances used in deodorants and explain its mechanism of action.
- Define cosmetics and cosmeceuticals. Classify cosmetics and cosmetic products with examples.
- Outline the structure of hair and hair growth cycle.
- Explain the role of henna and amla in hair care.
- Brief account on preparation for oily skin.
- Classification and applications of surfactants.
- Write a note on sebumeter.
- Summarize the cosmetic problem associated with Hair & scalp.
- Discuss briefly about vanishing creams.
- Explain cosmetics as quasi and OTC drugs.
- Write analytical methods for tooth paste.
- Define mouth wash.
- Give two applications of sunscreen lotion.
- Two examples for hair colorant.
- Antiperspirant.
- Humectants.
- Viscosity modifiers.
- Write the role of turmeric in skincare.
- Causes of hair loss.
- Define emollients.
- Applications of moisturiser.

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII
DIETARY SUPPLEMENTS AND NUTRACEUTICALS

- Describe the types of food adulterations in short. Explain with suitable examples how food adulteration is detected with rapid test.
- Defend the free radical theory of ageing with the help of its modifications.
- Explain the FDA regulations for nutraceuticals.
- Explain in detail the interaction of environmental factors on the potential of nutraceuticals.
- Elaborate vitamins as functional food.
- Summarize the role of free radicals in cancer.
- Why marine algae are refereed as super food?
- Elaborate “Reservetrol - a phytochemical as nutraceutical”.
- Compare and contrast the role of FSSAI and AGMARK rules and regulations.
- Interpret Flaxseeds and Ginkgo as nutraceuticals.
- Explain the role of Soya beans as nutraceutical.
- Enlist the sources of anthocyanidines. Give examples along with their chemical structures.
- Probiotics.
- Source and medicinal benefits of Broccoli.
- Active biomarkers of Garlic.
- Biological functions of Carotenoids.
- Chemical structure and medicinal benefits of Tocopherols.
- Butylated Hydroxy Anisole.
- Define nutraceuticals.
- Melatonin.
- Types of food adulteration.
- Lacto Bacillum.

B. PHARMACY DEGREE EXAMINATION
PCI PATTERN SEMESTER - VI
HERBAL DRUG TECHNOLOGY

- Explain the infrastructural and general requirements of herbal drug industry as per Good Manufacturing Practice.
- Discuss the role of Good Agricultural practice in cultivation of medicinal plants.
- Explain in detail about the herb – drug and herb – food interactions.
- Processing of herbal raw material.
- Preparation and Standardization of Lehya.
- Basic principles of Siddha system of medicine.
- Classification of Nutraceuticals with examples.
- Health benefits of Ginseng.
- Phytosomes.
- Stability testing of herbal drugs.
- Case study of NEEM.
- Schedule-Z of Drugs and Cosmetic Act for Ayurveda, Siddha, Unani drugs.
- Define Herb.
- What are primary and secondary metabolites?
- Explain Panchamahabhuta in Ayurveda.
- Give the sources and two health benefits of ALFA ALFA.
- Write the possible side effects of Ephedra.
- Mention two herbs used in Oral Hygiene products.
- Give the examples for diluents of natural origin.
- Define Intellectual Property Rights.
- Give any two objectives of Schedule-T.
- Enlist the types of Nutraceutical products available in market. Explain in detail the WHO guidelines for the assessment of herbal drugs.
- Explain the health benefits and role of Nutraceuticals in treating diabetes.
- a) Explain the advantages and disadvantages of herbal excipients.
- b) Write briefly on preparation and standardization of Arista.
- Basic principles of Homeopathic system of Medicine.
- Honey as health food.
- Possible side effects and interactions of Ginkobiloba.
- Natural sweeteners.
- Preparation of Herbal Tablets.
- ICH guidelines for assessment of herbal drugs.
- Components of Good Manufacturing Practice as per Schedule-T.
- Skin care products.
- Documents and Records of herbal drug industry as per Good Manufacturing Practice.
- Define the term Breeder's right.
- What is Bioprospecting?

- Define herbal drug preparation.
 - Write sources and two health benefits of chicory.
 - Write the health benefits of Amla.
 - What is Kava – Kava?
 - Give the examples for Natural Binders.
 - Give the drug interactions of Garlic.
 - Write briefly on natural perfumes with examples.
 - Write briefly on Bleaching agents.
 - Discuss in detail the plant based industries and institutions involved in work on medicinal and aromatic plants in India.
 - Explain the method of preparation and standardization of Churna.
 - Give a detail account on raw materials of herbal origin used in hair care products.
 - Identification and authentication of herbal materials.
 - Ashwagandha as health food.
 - Hypericum - side effects and interactions.
 - Natural colourants.
 - Herbal syrups.
 - Case study of Curcuma.
 - Ayurvedic, Siddha, Unani Drugs Technical Advisory Board 8. Present scope and future prospects of Herbal Drug Industry in India.
 - Importance of organic farming.
 - Define herbal Medicine.
 - What are bioinsecticides? Give two examples.
 - Explain Trigunas in Ayurveda.
 - What is law of similars?
 - Write briefly on functional foods.
 - Write the sources and health benefits of Fenugreek.
 - Mention two herbs used in the treatment of irritable bowel syndrome.
 - Write briefly on Farmers right.
 - What is Biopiracy?
 - What are viscosity builders?
-
- Explain Good Agriculture practices for Medicinal Plants.
 - What are the present and future scopes of Herbal Drug Industries in India.
 - Write in detail about ASU-DTAB and ASU- DCC
 - Explain Pest management in Medicinal plants.
 - Explain preparation and standardization of Asavas and Aristas.
 - Give the benefits and role of Nutraceuticals in Diabetes.
 - Write note on Herbal Skin care products.
 - What is Biopiracy? Explain patent case study of Curcuma.
 - Explain Schedule T in detail.
 - Write note on Industry – academia inter relation.
 - Differentiate with examples between Organic farming & Biodynamic agriculture.
 - Explain Garlic & Honey as Health food.
 - Define the term Herbal Medicine & Herbal Medicinal Products.

- Write various types of Extracts & their Drying methods.
- Write the side effect and interaction of Ginkobiloba.
- The role of Alfaalfa as nutraceuticals.
- Write ideal properties of Hair colours.
- Farmer's Right.
- IPR
- Homeopathy.
- Name some fixed oil used in herbal cosmetics.
- Phytosomes.

B.PHARM. THEORY EXAMINATION
SEMESTER -I
F. Y. B. PHARM 2018 & 2019 PATTERN
SUBJECT – HUMAN ANATOMY AND PHYSIOLOGY – I

- Write about the structure and functions of Autonomic Nervous System.
- Explain in detail about WBC.
- Reticulo-endothelial system.
- Explain the classification, structure, location and functions of Epithelial tissues.
- Describe the physiology of vision.
- Formation, circulation and composition of lymph.
- Describe various types of muscular tissues.
- Explain the different types of Anaemia.
- Explain about synovial joints.
- Structure and function of skin.
- Write about conduction system of heart.
- Explain the bones of the Skull.
- Explain the factors involved in the regulation of blood pressure.
- Function of bones.
- Hemophilia.
- Congestive heart failure.
- Cardiac output.
- Defects in the ear.
- Hypertension.
- Function of Ribosomes.
- Spinal nerves.
- Name the facial bones.
- Fate of RBC.
- Draw a neat labelled diagram of Heart. Explain in detail about it.
- Describe in detail about various pathways of clotting and add a note on functions of blood.
- Composition and function of lymph.
- Explain about connective tissues.
- Write about Homeostasis.
- Discuss about cardiac cycle and its sequences.
- Define Joint? Classify it with examples.
- Blood grouping and its significance.
- Regulation of blood pressure.
- Describe the structure and function of cell.
- Physiology of muscle contraction.
- Haemoglobin.
- Neurotransmitters of ANS.
- What is Electrocardiogram and mention its significance?
- Mention about Cell junction.
- Rh Factor.
- Heart sounds.
- Bones of Vertebral column.
- Glaucoma.
- Layers of skin.

- List out the basic life processes.
- Function of platelets.
- Erythroblastosis Foetalis.
- Draw a neat labeled structure of cell and mention its function.
- Write in details about salient features and functions of bones of axial and appendicular skeletal system.
- Describe anatomy of heart and write in detail about blood circulation.
- Structure and function of nervous tissue.
- Function of tissues.
- Describe the division of skeletal system, functions of skin.
- Immovable joint.
- Erythropoiesis.
- Function of lymphatic system.
- Function of parasympathetic system.
- Regulation of Blood pressure.
- Write anatomy of ear.
- Anaemia.
- Cardiac cycle.
- Purpura.
- Polycythemia.
- Gout.
- Olfaction.
- Hypoxia.
- Angina pectoris.
- Blood group.
- Myopia.
- What are Lymph nodes? Write about the structure and functions of lymph nodes.
- Explain the structure of eye with a neat labeled diagram. Describe the physiology of vision.
- Define and classify joints with necessary examples.
- Explain homeostasis.
- Classify connective tissues with example.
- Explain the physiology of muscle contraction.
- Write the composition and functions of blood.
- Short notes on eye disorders.
- Cardiac Arrhythmia.
- Neuromuscular Junction.
- Types of bones and its salient features.
- Add notes on blood transfusion.
- Functions of lysosomes.
- Classification of vertebral bones.
- Refractory period.
- Action potential.
- Ear ossicles.
- Taste buds.
- Peyer's patches.
- Mitosis.
- Pulse.

- Arteriosclerosis.
- Structure and functions of Skin.
- Describe the outflow and functions of Autonomic nervous system with special reference to Sympathetic division.
- Define Blood Pressure. Explain the various methods of measuring Blood Pressure. Write a note on factors affecting Blood Pressure.
- Discuss physiology of Cell membrane.
- Write notes on the Vertebral bones.
- Functions of Platelets.
- Physiology of heart.
- Hepatic circulation.
- Mechanism of Skeletal muscle contraction.
- Sacrum and Coccyx.
- Cranial nerves and its functions.
- Explain Auditory and Non-Auditory functions of Ear.
- Ganglia.
- Synapse.
- Hypoxia.
- Functions of Ribosomes.
- Composition of Lymph.
- Fate of red blood cells.
- Retina.
- Bones of skull.
- Glaucoma.
- Thalassaemia.
- Define Erythropoiesis. Explain the factors influencing Erythropoiesis.
- Give an account of anatomy and physiology of the Parasympathetic branch of autonomic nervous system.
- Write the help of a neat labeled diagram explain bones of Skull.
- Describe various types of Muscular tissue.
- Write a note on Lymph node.
- Discuss the mechanism of Clotting.
- Write a note on Megaloblastic anaemia and Iron deficiency anaemia.
- Physiology of Audition.
- Explain role of Baroreceptors and its functions.
- Write a note on Neuromuscular junction.
- Explain the Physiology behind Vision formation.
- Write a note on disorders of White Blood Corpuscle.
- Diseases of Eye
- Cardiac cycle
- Composition of blood
- Pulmonary circulation
- Hypertension
- Action potential
- Types of Joints
- Functions of Skin
- Presbyopia

- Christmas factor.
- Define Synapse? Enumerate the types of Synapses and describe Synaptic transmission.
- Classify Blood groups. Add a note on importance of Blood grouping and Rhesus factor.
- What is Circulation? Explain the Anatomy of blood vessels, add notes on the blood supply to Heart.
- Describe the structure and functions of Epithelial tissue.
- Write a note on various types of Anaemia.
- Composition and functions of Lymph.
- Functions of Plasma proteins.
- Physiology of vision and disorders of Eye.
- Pulmonary circulation and its functions.
- Describe conducting system of Heart.
- Sense of taste and physiology of taste in brief.
- Bones of Skull.
- Pancytopenia
- Von Willebrand disease
- Circumduction
- Rods and Cones 5. Diseases of Eye.
- Functions of Skeleton
- Neuromuscular junction
- Christmas factor
- Presbycusis 10. Functions of Skin.
- Explain the anatomy of Tongue.
- Explain detail about Peripheral nervous system.
- Explain the structure, function and disorder of Nose.
- Describe the salient features and function of Bone.
- Write a note on Cranial nerves.
- Composition and functions of Lymph.
- Functions of Plasma proteins.
- Physiology of vision and disorders of Eye.
- Write a note on ECG.
- Describe conducting system of Heart.
- Sense of taste and physiology of taste in brief.
- Synovial joint.
- Function of Spleen.
- Cell communication.
- Circumduction.
- Rods and Cones.
- Hypertension.
- Functions of Skin.
- Neuromuscular junction.
- Christmas factor.
- Cochlea.
- Blood groups.

B.PHARM. DEGREE EXAMINATION
PCI PATTERN SEMESTER II
FIRST YEAR
HUMAN ANATOMY AND PHYSIOLOGY – II

- Write about the structure and functions of brain.
- Explain the anatomy of respiratory system with neat labelled diagram. Add a note on mechanism of respiration.
- a) Explain about anatomy of female reproductive system.
- b) Give a brief note on menstrual cycle.
- Physiology of urine formation.
- Endocrine function of pancreas.
- Reflex action.
- Anatomy and functions of liver.
- Role of RAS in kidney.
- Resuscitation methods.
- Write about neurotransmitter with examples.
- Hormones secreted by anterior pituitary gland.
- Spermatogenesis.
- Define mountain sickness.
- Acromegaly.
- Define BMR.
- Neuroglia.
- Define saliva and its functions.
- Functions of hypothalamus.
- Tidal volume.
- Micturition reflex.
- Hepatitis.
- Define oogenesis.
- Explain the structure of Kidney with a neat diagram and discuss the functions of kidney.
- Draw the structure of adrenal glands.
- Discuss the hormones secreted by adrenal glands and their functions.
- Explain ovulation.
- Outline the various events of menstrual cycle.
- Give the composition of cerebrospinal fluid.
- Composition and functions of pancreatic juice.
- Discuss the physiology and functions of thyroid glands.
- Explain the mechanism of respiration.
- Give the composition and role of saliva in digestion.
- Spermatogenesis.
- Describe the associated structures and functions of cerebellum.
- Explain the role of pepsin in protein digestion.
- Anatomy of GI tract and discuss the function of stomach.
- Reflex arc.
- Parturition.
- Write on chromosomes.
- Composition of bile.
- Fertilization.

- What is genetic pattern of inheritance?
- Resting membrane potential.
- Functions of liver.
- Neurotransmitters.
- BMR.
- Name the four surface lobes of the Cerebral hemisphere and describe the functions of the Cortex in each lobe.
- Explain about the anatomy and physiology of Digestive system.
- With illustrated diagram explain about the structure and function of a Nephron.
- Explain about the mechanism of hormone action.
- Discuss about the internal structure of the female reproductive system with diagram.
- Describe about Oogenesis.
- Write a brief note on pregnancy and parturition.
- Genetic pattern of inheritance.
- Write a note on neurotransmitter receptors with examples.
- Discuss about the process of acid regulation in digestive system.
- Discuss about the formation and role of ATP.
- Name the various functions of the respiratory system.
- Functions of cerebellum.
- Parts of Stomach.
- Gall bladder.
- Inflammatory Bowel Disease.
- Naso pharynx.
- Carbondioxide transport in blood.
- Urinary Bladder.
- Diabetic nephrophathy.
- Vasopressin.
- Diabetes mellitus.
- With a neat diagram and explain the anatomy of the respiratory system and give the functions of respiratory organs. b) Add a note on regulation of respiration.
- Draw a diagram and describe the Pancreas.
- Explain their role in digestion and absorption of nutrients.
- Explain the structure and functions of male and female reproductive system.
- Define gene and explain the functions of the gene.
- Discuss the various stages of the menstrual cycle.
- Organization of nervous system.
- Structure and functions of pituitary gland.
- Role of RAS in kidney.
- Different types of salivary glands, composition of saliva.
- Protein synthesis.
- Describe the structure and functions of liver.
- Draw a neat diagram of a neuron and discuss briefly on action potential.
- What is resuscitation?
- Diabetes mellitus.
- Spermatogenesis.
- Give the composition of bile.
- Define vital capacity.

- BMR.
- Creatine phosphate.
- Role of different hormones in parturition.
- Artificial respiration.
- Components of DNA.
- Describe anatomy and physiological functions of Thyroid gland.
- Explain the consequence of hypothyroidism and hyperthyroidism.
- Discuss in detail the anatomy and functions of Male reproductive system.
- Write in detail about physiology of Urine formation. Adds a note on micturition.
- Write about Oogenesis.
- Enlist the function of the Liver.
- Give the composition and function of Cerebrospinal fluid.
- Add a note on artificial respiration.
- Describe organization of the Nervous system.
- Reflex action.
- Define and classify hormones.
- Discuss Fertilization.
- Role of Renin Angiotensin system in kidney.
- Give the composition of bile.
- Function of neuroglia.
- Define vital capacity.
- What is Spermatogenesis.
- What is GFR. Give its normal values.
- Hormones of parturition.
- Draw a neat diagram of neuron and label it.
- List out the properties of nerve fiber. 9. What is the importance of meninges.
- 10. Functions of Cerebrum and Cerebellum.
- Discuss the anatomy of Respiratory organs with neat labeled diagram and explain the mechanism of Respiration.
- Give the physiological functions of Female Sex hormones. Discuss the various stages of Menstrual Cycle.
- Draw a neat diagram and describe the organs of Digestive system. Explain their role in digestion of food.
- Mention the physiological significance of BMR.
- Write short notes on Genes.
- List out the function of Kidney and Urinary tract.
- Discuss Cranial nerves and its function.
- Role of Kidneys in acid base balance.
- Describe ventricles of the Brain.
- Diagrammatically explain the events involved in an action potential.
- Draw and describe the structure of Nephron.
- Write short notes on Male Sex Hormones.
- What is cholecystitis?
- Function of Uterus.
- Define Synapse.
- What is transcription and translation?
- Define Chromosomes.
- Define Residual and Tidal volume.

- What are the functions of Gall bladder?
- Define Saliva and its functions.
- Cerebrospinal fluid.
- Define ingestion and defecation.
- Describe the anatomical parts of the Brain. Add a note on its functions.
- Classify the hormones of Pituitary gland. Give the physiological functions and disorders of growth hormones.
- With a neat labeled diagram explain the anatomy of Kidney and Nephron and its functions.
- Discuss the process of digestion in the Small Intestine.
- Write a note on meninges of Brain.
- Formation and role of ATP.
- Add a note on receptor and its type.
- Describe Adrenal cortex disorder.
- Define Pregnancy and add stages of pregnancy.
- Write about neurotransmitters with examples.
- Describe the role of pepsin in protein digestion.
- Short note on Neuroglia.
- Define Hypoxia.
- Write is the role of pancreas in digestion of food.
- What are the constituents of Saliva?
- Write the function of Hypothalamus.
- Explain the role of bile salts.
- What is respiration?
- Define ganglia.
- Write the function of placenta.
- Define Genetic code.
- What are Androgens and Estrogens?

B.PHARM. DEGREE EXAMINATION
PCI PATTERN – SEMESTER V
INDUSTRIAL PHARMACY – I

- Give an account of the Physico-chemical characteristics of drugs in Preformulation studies and explain its importance.
- Explain the types, formulation and evaluation of both suspensions and emulsions.
- Define parenteral products with examples. Write the formulation considerations, method of preparation, labeling procedures and evaluation of eye drops.
- Quality control tests for capsules.
- Formulation of lyophilized sterile products.
- Packaging materials used in pharmaceutical preparations.
- Ideal properties of shampoo.
- Preparation of cold cream.
- Types of aerosol systems.
- Pellets.
- BCS classification and its importance.
- Coating materials.
- Methods of coating.
- Stability of dosage forms.
- Organoleptic additives.
- Sizes of hard gelatin capsules.
- Composition and uses of syrup.
- Preservatives used in sterile preparations.
- Composition of lipsticks.
- Alu-Alu pack.
- Define aerosols.
- Inert gases.
- Explain about the production of hard gelatin capsule.
- Write in detail about the manufacturing defects of tablets.
- Describe the quality control test to be carried out for pharmaceutical aerosols.
- Sugar coating process.
- Physical factors of drug that affect stability of dosage form.
- Define pyrogens. Describe pyrogen test.
- Wet granulation Method and its limitations.
- Define a dosage form. Give the classification of dosage form.
- Explain the different additives used in parenteral formulations.
- Shampoo.
- Syrups.
- Explain the identification tests for emulsion type.
- Slugging.
- Importance of tablet coating.
- Organoleptic additives.
- Types of aerosol systems.
- Name the enteric coated polymers.

- Labeling method of eye preparations.
- Diluents.
- Components of a rotary punching machine 9. Types of stability studies.
- 10. Importance of hardness test on tablet.

- Define tablet, classify them. Describe in detail about excipient used and evaluation tests for tablets.
- Explain the production procedures and production facilities of aseptic processing in the formulation of Injectables.
- Explain the production of hard gelatin capsules and filing, finishing and quality control tests.
- Physical properties of drugs in preformulation studies.
- Sterilization procedures of large volume parenterals (LVP).
- Types of packaging material and its importance.
- Tooth pastes.
- Propellants used in pharmaceutical aerosols.
- Coating of tablets and its application.
- Additives used in Liquid dosage forms.
- Formulation of eye drops.
- Ideal properties of coating materials.
- Bloom strength.
- Types of suspensions.
- Define Elixirs.
- IPQC tests.
- Diluents.
- Aseptic conditions.
- Polymorphism 8. Blister pack.
- Valve assembly in aerosols.
- Advantages of soft gelatin capsules.
- Give an account of methods of coating of tablets. Explain the process of sugar coating and its pharmaceutical applications.
- Define pharmaceutical aerosols. Discuss in detail about types, propellants used, formulation and evaluation of aerosols.
- Explain the manufacturing, quality control tests, packing, storage and applications of soft gelatin capsules.
- Film formers.
- Application of preformulation considerations of solids.
- Sterile powders.
- Lipsticks.
- Evaluation tests for tablets.
- Small volume parenterals.
- Chemical properties of preformulation studies.
- Eye ointment.
- Evaluation of suspension.
- Non aqueous vehicle in parenterals.
- Enteric coating.

- Sunscreens.
- Sizes and volumes of hard gelatin capsules.
- Binders.
- Isotonicity.
- Flow properties.
- Eye drops.
- Application of creams.
- LAL Test.

B. PHARMACY DEGREE EXAMINATION
PCI PATTERN SEMESTER - VII
INDUSTRIAL PHARMACY - II

- Discuss general considerations of Investigational new drug application.
- Discuss about documentation, premises and equipments for TT as per WHO guidelines.
- What is full form of SUPAC guideline? Discuss its application and significance.
- Write a note on clinical research protocol.
- Discuss total quality management.
- Biostatistics in Pharmaceutical product development.
- Regulatory requirement of bioequivalence studies.
- Describe the clinical trial protocol.
- Explain the procedure for pilot plant scale-up for liquid orals.
- Explain technology transfer from R & D to production as per WHO guidelines.
- Organizational structure of regulatory affairs.
- Explain in brief concept of quality by design.
- CDSCO.
- Define finished pharmaceutical product.
- Define Six sigma.
- TT agencies in India.
- COPP.
- State licensing Authority.
- What is quality control?
- What is Good Manufacturing Practices?
- What is qualification and validation?
- Why to conduct pilot plant studies?
- Explain the procedure for pilot plant scale-up semisolid dosage form
- Define technology transfer .what is sending unit and receiving unit? Write the WHO Guidelines for technology transfer.
- What are the regulatory requirements and approval procedures for new drugs?
- Write briefly on the Technology Transfer (TT) process for finished product
- Write a note on Drug Master Files
- Discuss NDA regulatory approval process with suitable examples
- Write a short note on Investigator's Brochure (IB).
- Write a short note on post marketing surveillance 6. Write a short note on management of clinical studies 7. SUPAC Guidelines.
- Discuss the role and responsibility of regulatory affairs.
- Analytical method Technology Transfer.
- What are BE & BA studies?
- What are the advantages of pilot plant studies?
- Advantages of technology transfer.
- What is the purpose of pre-clinical testing?

- What is Good Laboratory Practices?
- National Research Development Corporation (NRDC).
- What do you mean by ANDA?
- Define clinical research.
- Quality by Design (QbD) 10. Define In-process control.

B. PHARMACY DEGREE EXAMINATION
PCI PATTERN SEMESTER - VII
INSTRUMENTAL METHODS OF ANALYSIS

- Write the principle and instrumentation of double beam UV spectrophotometer with a neat diagram.
- Define electrophoresis. Explain in detail about gel electrophoresis and capillary electrophoresis.
- Write the principle and instrumentation of Gas chromatography.
- Explain about the preparation and activation of TLC plates.
- Describe the types of ion exchange resins used in ion exchange chromatography?
- Explain the principle and instrumentation involved in flame emission spectroscopy.
- Write about the different development techniques used in Paper chromatography.
- What are the different types of vibrations in IR spectroscopy?
- Discuss the factors affecting the fluorescence intensity.
- Write in short about paper electrophoresis.
- Write the principle and instrumentation of Nephelometry. 9. Write the applications of atomic absorption spectroscopy.
- Define Beers-Lamberts Law.
- What is Bathochromic shift?
- Define the term Luminescence.
- What is Rf value? How it is determined?
- Write any two applications of affinity chromatography.
- What is silicagel GF?
- Mention the light source used in Atomic Absorption Spectroscopy.
- What is tailing and fronting peak?
- Define Isosbestic point.
- What is HETP?
- Explain the principle, and instrumentation in Gel chromatography.
- (a) Define and derive a mathematical expression for combined Beer's–Lamberts law.
- (b)Add a note on deviations from Beer's –Lamberts law.
- Write in detail about principle, types of ion exchangers used and applications of ion exchange Chromatography.
- Explain the principle involved in fluorimetry with Jablonski diagram.
- Write a brief note on detecting agents used in paper chromatography.
- Describe the working principle of hollow cathode lamp with neat diagram.
- Write the principle and applications of Gas chromatography.
- Explain about the different types of detection techniques in TLC.
- Write about different system suitability parameters used in HPLC.
- Explain the sampling techniques for solids in IR spectroscopy.
- Write the principle and applications of nephelo-turbidimetry.
- Explain the different types of electronic transitions involved in UV spectroscopy.
- Describe the terms Bathochromic shift and hypsochromic shift.
- Define the term static quenching.
- What is ODS?
- What is normal phase chromatography?

- What are auxochromes?
- What is capacity factor?
- Write the applications of affinity chromatography.
- Mention the light source used in IR spectroscopy.
- What is edge effect?
- What is derivatisation?

B.PHARM. DEGREE EXAMINATION

PCI PATTERN – SEMESTER IV

MEDICINAL CHEMISTRY – I

- Explain how the following physicochemical properties affect drug action.
- Hydrogen bonding ii) Geometrical isomerism iii) Protein binding
- Define the process of metabolism? Illustrate the factors affecting metabolism of drugs.
- What are drug receptors? Write a note on the different types of receptors available for drug action.
- Define and classify adrenergic antagonists with suitable examples. Write the synthesis and uses of i) Tolazoline ii) Propranolol.
- What are general anaesthetics? Classify them with suitable examples.
- Explain the mechanism of action of general anaesthetic agents. Write the synthesis of halothane.
- Describe the SAR of sympathomimetic agents.
- Write a note on synthetic cholinergic blocking agents.
- Give synthesis and uses of Salbutamol and Ibuprofen.
- Present the SAR of phenothiazines.
- Describe about anticonvulsants with appropriate chemical structures.
- Write a note on narcotic analgesics.
- Enumerate the facts about anti-inflammatory agents. Write the structure and uses of: i) Mefenamic acid ii) Diclofenac.
- Write a short note on anti-psychotic drugs.
- Arrive biosynthesis and catabolism of acetyl choline.
- Chelation.
- Prodrug.
- Mechanism of action of barbiturates.
- Cholinesterase reactivator.
- Catecholamines.
- Mechanism of action of sedatives and hypnotics.
- Cholinergic receptors.
- Clinical uses of diazepam.
- Write the structure of methyl dopa.
- Catabolism.
- What are sedative and hypnotics? Classify sedative and hypnotics.
- Discuss the structural activity relationship of benzodiazepines and outline the synthesis of Diazepam.
- Explain in detail about Phase II metabolism reactions with examples.
- Discuss the structural activity relationship of β phenyl ethyl amines of direct acting sympathomimetics.
- Explain the biosynthesis, metabolism and physiological role of adrenergic neurotransmitters.
- Discuss the structural activity relationship of anticonvulsants and outline the synthesis of ethosuximide.
- Explain the mechanism of nonsteroidal anti-inflammatory agents and outline the synthesis of Ibuprofen.
- Explain the factors affecting drug metabolism including stereochemical aspects.
- Discuss the structural activity relationship of β blockers and outline the synthesis of propranolol.
- What are the general anaesthetics? Classify general anaesthetics with examples.

- a) Explain the biosynthesis and catabolism of acetylcholine
- Explain the muscarinic and nicotinic receptors and their distribution.
- What are narcotic analgesics? Classify narcotic analgesics and outline the synthesis of fentanyl citrate.
- Classify sympathomimetic agents and outline the synthesis of salbutamol.
- Write the structure and medicinal uses of prazocine.
- Write briefly on the mechanism of action of phenothiazine.
- Give the structure and medicinal uses of any one fluorobutyrophenones.
- What is Easson Stedman hypothesis?
- Write briefly on SAR of imidazoline nucleus of α adrenergic receptor agonist.
- Explain the mechanism of action of β -haloalkylamines of adrenergic receptor antagonist.
- Explain why non selective β blockers are contraindicated for the patients in conditions like Asthma and bronchitis?
- Write the structure, numbering and uses of codeine.
- Write briefly on mechanism of action of phenytoin.
- What happens on replacement of oxygen atom by sulphur atom on carbon-2 of barbiturates structure? Give its actions and uses.
- Explain in detail the structural activity relationship of morphine and related compounds.
- What are cholinergic agonists? Discuss the structural activity relationship of cholinergic agonist. Outline the synthesis of Neostigmine.
- Explain the following physiochemical properties related to the biological action.
- Hydrogen bonding b) Optical and geometrical isomerism.
- Classify cholinergic blocking agents. Outline the synthesis of Dicyclomine hydrochloride.
- Explain the mechanism of action of Barbiturates and outline the synthesis of barbital.
- Outline the synthesis of carbamazepine and mention its uses.
- Write a note on ultra short acting barbiturates and outline the synthesis of Methohexital sodium.
- Explain Phase I metabolism of hepatic cytochrome P 450 system.
- Write a note on cardio selective β_1 blockers and write the structure and medicinal uses of any two drugs.
- Explain protein binding with examples.
- Discuss the structural activity relationship of Phenothiazine.
- a) Outline the synthesis of Chlorpromazine and its medicinal uses.
- Write the structure of Trifluoperazine and Thioridazine and mention their uses.
- Sketch the structure of clonidine and its medicinal use.
- What happens on the replacement of N-H group at position 1 of the hydantoin system with an oxygen atom. Write the structure of any one drug from this system and its uses.
- Sketch the structure of naloxone and mention its uses.
- Outline the synthesis of phenylphrine and mention its uses.
- Sketch the structures of imidazoline nucleus of α adrenergic antagonist.
- What happens on the replacement of N-H moiety of phenothiazine ring with a carbon atom doubly bonded to propylidene side chain. Sketch the structure and its stereo selectivity.
- Explain briefly on the stereo selectivity of β blocking agents.
- Write the structure of pralidoxime hydrochloride and its uses.
- Sketch the structure of naproxen and piroxicam and its uses.
- Sketch the structure of procyclidine and its uses.

- a) List out the physicochemical properties that influence biological action. With suitable examples explain how the following properties affect drug absorption. (6) i) Solubility ii) Ionization iii) Hydrogen bonding.
- b) Write briefly on enzyme system involved in I Phase metabolism of drugs. (4)
- a) What are adrenergic neurotransmitters? Classify them with suitable examples. (3)
- Write in detail about biosynthesis and catabolism of catecholamines. (3)
- Mention the use and synthesis of salbutamol (4)
- a) Define and classify sedatives and hypnotics with suitable examples. (3)
- Summarize the SAR of benzodiazepines. (3)
- Write the synthesis and use of diazepam. (4)
- Write a note on the different types of receptors meant for drug action.
- Outline the various factors that influence metabolism.
- Write a note on cholinergic blocking agents.
- Write a note on phenothiazines as antipsychotic agents.
- Define beta-adrenergic blocking drugs with structural representation.
- What are anticonvulsants? Write the SAR of barbiturates.
- Define general anaesthetics with a mention on their mechanism of action. Write the structure and uses of i) Methohexital Sodium ii) Ketamine Hcl.
- Summarise the SAR of beta-blockers.
- What are NSAIDs? Write the synthesis of Ibuprofen.
- Agonist.
- Ferguson principle.
- Clinical uses of alprazolam.
- Protein binding of drugs.
- Structure and uses of phenobarbitone.
- Dissociative anaesthetics.
- Cholinergic receptors.
- Xenobiotics.
- Structure and use of phenytoin.
- Synthesis of aspirin from benzoic acid.
- a) Discuss the structural activity relationship of non narcotic anti inflammatory agents.
- Outline the synthesis of Mefenamic acid and its uses.
- Explain the mechanism of action of general anaesthetics and outline the synthesis of ketamine hydrochloride and halothane.
- a) Discuss the structural activity relationship of barbiturates.
- Sketch the structure of Glutethimide and meprobamate and its medicinal uses.
- Explain the formation of action potential and outline the synthesis of phenytoin.
- Outline the synthesis of methadone hydrochloride and its uses.
- Describe the chemistry of irreversible inhibitors of cholinesterase and their mode of action.
- Write a note on β blockers with α_1 receptor antagonist activity with chemical structure and its uses.
- Write a note on inhalation anaesthetics with their structure and medicinal uses.
- Explain the structural considerations of solanaceous alkaloids.
- Explain chelation and bioisosterism with examples.
- Outline the synthesis of iprotropium bromide and mention its uses.
- a) What happens when dihydromorphinone is substituted with C-14 hydroxyl group. Sketch the resulting structure and its medicinal uses. Sketch the structure of diphenoxylate and its uses.

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

B.PHARM. DEGREE EXAMINATION
PCI PATTERN – SEMESTER V
MEDICINAL CHEMISTRY – II

- What are antihistamines? What do you mean by H1 & H2-receptor antagonists?
- Discuss its mechanism of action and classify them with examples.
- Give the structures of any two antihistamines with pyrimidine nucleus. Add a note on synthesis of Promethazine HCl.
- Classify anti-neoplastic agents.
- Discuss the mechanism of action of its alkylating agents & anti-metabolites.
- Give the synthesis and uses of Disopyramide and MTX.
- Detail on Insulin and its preparations.
- Write the classification of Anti-anginal. Explain the MOA of β -blocker and CCB classes of anti-anginal.
- Write the syntheses of High ceiling and Carbonic anhydrase inhibitor type diuretics.
- Give an account on SAR of Local anaesthetics.
- Write the structures and uses of :
 - i) Diazoxide ii) Nitroglycerin iii) Metformin and iv) Lidocaine
- Justify for the administration of:
 - i) Lidocaine with Adrenaline and ii) Anticoagulants with Sulfa drugs
- Discuss HMG-CoA reductase inhibitors as Anti-hyperlipidemic agents. Give any one structure.
- Write the syntheses and uses of Isosorbide dinitrate and Triprolidine HCl.
- Explain the mechanism of action of Diuretics.
- Discuss the nomenclature and stereochemistry of steroids.
- Classification of anti-arrhythmic drugs.
- What are Potassium sparing Diuretics? Give examples.
- Define Cardiotonics, give examples.
- Give the structures and uses of Hydralazine HCl and Fluorouracil.
- Write the general pharmacophore for Anti-histamines with one drug's structure.
- Mechanism of action of anticoagulants.
- Give the synthesis and use of Benzocaine.
- Enumerate the lists of CHF. Give the structure of any one.
- Define erectile dysfunction agents with examples.
- Classify Local anaesthetics.
- Give the structures and uses of Clofibrate and Nifedipine.
- Classify Anti-neoplastic agents with suitable examples. Explain the mechanism of action and therapeutic uses of antimetabolites.
- Write the synthesis and uses of Mechlorethamine and Methotrexate.
- Explain the chemistry of steroids. Write briefly on corticosteroids.
- Write a note on Insulin and its preparations.
- Classify antihistaminic drugs with suitable examples. Explain the chemistry, SAR and mechanism of action of H1-receptor antagonists. Write the synthesis of Diphenhydramine hydrochloride.
- Classify antianginal drugs. Write the synthesis and uses of Isosorbide dinitrate.
- Write the structure and uses of a) Thiotepa b) Nifedipine c) Hydrochlorothiazide
- d) Digoxin e) Lidocaine hydrochloride.
- Explain the SAR of local anaesthetics.
- Write a note on H2-blockers. Give the structure of Ranitidine and Famotidine.

- Explain the mechanism of action of biguanides as antidiabetic drugs. Give the structure and uses of Metformin.
- Write a note on thyroid hormones. Give the structure of L-Thyroxine and L-Thyronine.
- Write the structure, mechanism of action and medicinal uses of Sildenafil citrate.
- Explain the physiological function of androgens. Give the structure and uses of Testosterone and Nandralone.
- Write the synthesis and mechanism of action of Benzocaine.
- Short answers on: Answer ALL questions. (10 x 2 = 20)
- Write a note on glucosidase inhibitors as antidiabetic agents.
- What are oral contraceptives? Give the structure and uses of Mifepristone.
- Give the structure and medicinal uses of Betamethasone.
- Write the clinical importance of potassium sparing diuretics. Give example.
- Write the name and mechanism of action of plant products as anticancer agents.
- Write the structure and uses of Reserpine.
- Give the structure and uses of Bosentan and Amlodipine.
- What are the clinical uses of Cholestyramine. Explain its mechanism of action.
- Write a note on calcium channel blockers.
- Write the structure and uses of Butamben and Procaine.
- Classify Anti-hypertensive drugs with suitable examples. Explain the mechanism of action and therapeutic uses of ACE inhibitors.
- Write the synthesis and uses of Methyl Dopa.
- Write the classification of diuretics. Explain the chemistry of thiazide diuretics. Write synthesis of Chlorthiazide.
- Explain the mechanism of action of organic nitrates and nitrites as antianginal drugs. Give the synthesis and uses of Isosorbide dinitrate and Nitroglycerin.
- Write a note on anticancer antibiotics. Explain chemistry and MOA of any one drug.
- Classify antiarrhythmic drugs. Write the structure and MOA of Lidocaine hydrochloride.
- Write a note on physiological role of histamine, types of histamine receptors in human body.
- Explain the clinical uses of H1-receptor antagonists. Give the structure of Chlorpheniramine and Cetrizine.
- Explain the synthesis and uses of Promethazine hydrochloride.
- Write a note on the drugs used in congestive heart failure.
- Write the structure, mechanism of action and medicinal uses of Tadalafil.
- Write the synthesis of Procaine. Mention its therapeutic applications.
- Write a note on Insulin and its preparations.
- Classification of steroids.
- What are oral contraceptives? Give the structure and uses of Levonorgestrel.
- Give the structure and medicinal uses of Prednisolone.
- Write the clinical importance of thyroid hormones.
- Write the structure and uses of Cisplatin.
- Write the structure and uses of Verapamil.
- Give the structure and uses of Bosentan and Digitoxin.
- What are the clinical uses of Clofibrate. Explain its mechanism of action.
- Give two examples of proton pump inhibitors.
- Write the structure and uses of Thioguanine and Busulfan.
- Define and Classify Anti-neoplastics.
- Explain the mechanism of action of any four major classes of anti-cancer drugs.
- Give the syntheses and uses of Tolbutamide and Mechlorethamine.

- Classify Local-anaesthetics.
- Enumerate the structures (any three), mechanism of action and SAR of Local anesthetics.
- Give the synthesis of Procaine.
- Give an account on Thyroid and anti-thyroid drugs.
- Classify Anti-hypertensive agents.
- Discuss on MOA of Anti-hypertensive & synthesis of Methyldopate HCl.
- Give the syntheses and uses of Dibucaine and Triprolidine HCl.
- Give any two structures of Thiazide class of Diuretics and discuss its mechanism of action.
- Account on ACE inhibitor, with example structures of drugs.
- Write the syntheses and uses of Dibucaine and Disopyramide Phospahte.
- Classification of Diuretics.
- Give the structures & uses of any two 1,4-dihydropyridine and Piperazine based drugs.
- Discuss on Biosynthesis & Preparations of Insulin.
- Illustrate the classification of Anti-histamines and Anti-coagulants.
- Mechanism of action of Anti-arrhythmic drugs.
- Give the structure and uses of Diethyl stilbesterol.
- What do you mean by Repolarisation elongators? Give examples
- Write the structure and use of Lovastatin
- Define and give example for Vasodilators.
- Mention the examples for Cardiac smooth muscle relaxants. Give any one structure.
- Enumerate the lists of AT1-antagonists, Give the structure of any one drug.
- Give the synthesis and use of Mercaptopurine.
- Exemplify ganglionic blockers with one structure.
- Write the general pharmacophore for Beta blockers, add examples.
- Structure and use of Isosorbide dinitrite.

**B. PHARMACY DEGREE EXAMINATION PCI
PATTERN SEMESTER -VI MEDICINAL
CHEMISTRY III**

- Define Tuberculosis and Anti- tubercular agents. Write about synthesis, mechanism of action of Isoniazid and para amino salicylic acid.
- Write about Solid phase synthesis and applications of combinatorial chemistry.
- Write the nomenclature, classification and Structure activity relationship of Tetracycline.
- Classification of anti – viral agents.
- Write a short note on Beta lactamase inhibitors.
- Discuss about various approaches used in drug design.
- Write about synthesis of Trimethoprim and Dapsone.
- Write a note on Macrolide antibiotics.
- Basic concepts of prodrug design.
- Write about synthesis of Miconazole and Tolnaftate.
- Write the structures for the following: a). Metronidazole b). Chloroquine
- c). Cotrimoxazole d). Chlorobutanol e). Hexamine
- Write a short note on Taft's steric parameter.
- Define partition coefficient.
- Molecular docking.
- Write the structure and use of Methanamine.
- Write the structure of Amantadine Hcl.
- Define Anthelmintics.
- Pharmacophore modeling.
- Antifungal agents.
- Combinatorial chemistry.
- Structure and uses of Quinine sulphate.
- Mechanism of action of Erythromycin.
- Discuss briefly about chemistry, classification and SAR of Sulfonamides.
- Write about the physico-chemical parameters used in Quantitative Structure Activity Relationship (QSAR) studies.
- Write about the nomenclature, classification and degradation of penicillin.
- Write a note on pharmacophore modeling.
- Discuss about Structure activity relationship of Quinolones.
- Write about synthesis and uses of Chloramphenicol.
- Define and classify drugs used for Urinary tract infection (UTI).
- Write the structures for the following :
- a). Ketoconazole b). Acyclovir c). Pyrazinamide d). Thiabendazole
- e). Sulfamethoxazole.
- Write a note on Aminoglycosides.
- Write the synthesis, mechanism of action and uses of Sulfacetamide.
- Write a note on Anti – malarial drugs.
- Write the application of prodrug.
- Write the synthesis of nitrofurantoin.
- What is molecular docking?
- Write a note on Monobactams.
- What are beta lactamase inhibitors?

- Write the structure and uses of Cycloserine.
- Write the uses of Nalidixic acid and Clotrimazole.
- Write the synthesis of Diethyl carbamazepine citrate.
- Define partition coefficient.
- Write the structure and uses of para amino salicylic acid.
- Define anthelmintics with examples.
- Define Anti – malarial drugs, write about its classification and synthesis of Chloroquine and Pamaquine.
- Define combinatorial chemistry and write about solution phase synthesis.
- a). Define Antibiotics. Write about the classification of anti – biotics.
- b). Write about the synthesis and uses of Sulfacetamide and Sulfamethoxazole.
- Classify Antiprotozoal agents.
- Write about synthesis and uses of Ciprofloxacin.
- Structure activity relationship of Quinolines.
- Write about applications of prodrug design.
- Write the structure, mechanism of action and uses of Cephalosporin.
- Write short notes on biguanides.
- Molecular docking techniques.
- Write about the synthesis and uses of Nitrofurantoin.
- Write about Hansch analysis.
- Mechanism of Penicillin.
- Define Pharmacophore.
- Give the importance of QSAR studies.
- What is Cotrimoxazole.
- Define Molecular modeling.
- Write the mechanism of action of Albendazole.
- Write the structure and use of Dapsone.
- Anti – Protozoal agents.
- Write a note on Sulfones.
- Structure of Metronidazole.
- Discuss the chemistry, mechanism of action, SAR and synthesis of Chloramphenicol.
- Classify sulphonamides. Briefly discuss the mechanism of action and SAR of sulphonamides. Enumerate the synthesis of sulfacetamide.
- Write a brief account on lipophilic parameters and electronic descriptors involved in QSAR.
- Classify quinolone urinary tract anti-infectives and write the structure and MOA of any two fluoro quinolones.
- Describe briefly on various approaches of prodrug design.
- Give a note on Azole antifungals.
- Describe the structure and mechanism of action of Metronidazole and Tinidazole.
- Write a short note on β -lactamase inhibitors.
- Write the structure and uses of Mebendazole and Diethylcarbamate citrate
- Write the mechanism of action and SAR of aminoglycosides.
- Synthesis of pamaquine.
- Write the classification and SAR of penicillin antibiotics.
- MOA of tetracyclines.

- Structure and uses of Rifampicin.
- Monobactam antibiotics.
- Structure of any two cephalosporins.
- Classify antiprotozoal agents.
- Nalidixic acid.
- Write benzimidazole anthelmintics.
- Any two β -lactamase resistant penicillins.
- HIV Protease inhibitors.
- Define Combinatorial Chemistry along with any two applications?

**B. PHARMACY DEGREE EXAMINATION
PCI PATTERN SEMESTER - VII
NOVEL DRUG DELIVERY SYSTEM**

- Discuss about the polymers in controlled release drug delivery system.
- Write about the implantable drug delivery system.
- Discuss about the ocular drug delivery system.
- Advantages and disadvantages of controlled drug delivery system.
- Coacervation - phase separation method.
- Basic components of Transdermal drug delivery system.
- Floating drug delivery system.
- Nasal drug delivery system.
- Approaches of targeted drug delivery system.
- Intra uterine drug delivery system.
- Preparation of monoclonal antibodies.
- Pulmonary drug delivery system.
- Terminology of controlled drug delivery system.
- Characteristics of ideal polymers.
- Advantages of microencapsulation.
- Stages of mucoadhesion.
- List out evaluation test of Transdermal drug delivery system.
- Mucoadhesive drug delivery system.
- Targeted drug delivery system.
- Nanoparticle.
- Inserts.
- Types of intrauterine device.
- Discuss about the approaches to design controlled release formulation.
- Write about the liposomes targeted drug delivery system.
- Write about the methods of microencapsulation.
- Applications of nasal drug delivery system.
- Metered dose inhalers.
- Niosomes.
- Applications of monoclonal antibodies.
- Intrauterine device.
- Barriers to ocular drug delivery system.
- Evaluation of nanoparticles.
- Factors affecting permeation of Transdermal drug delivery system.
- Dissolution controlled release system.
- Advantages of controlled drug delivery.
- Natural Polymers.
- Advantages of micro encapsulation.
- Air suspension techniques.
- Drugs suitable for Gastro-retentive drug delivery system.
- Floating drug delivery system.

- Advantages of transdermal drug delivery systems.
- Applications of niosomes.
- Ocuserts.
- Application of nanoparticle.

B.PHARM. DEGREE EXAMINATION
PCI PATTERN – SEMESTER II FIRST YEAR
PATHOPHYSIOLOGY

- Explain about causes and pathogenesis of cell injury.
- Give in detail about types of inflammation with their mechanism.
- Discuss about etiology and pathogenesis of diabetes mellitus.
- Describe the etiology of acute renal failure.
- Write notes on clinical signs of inflammation.
- Explain about classification of cancer.
- Write briefly about pathogenesis of tuberculosis.
- Give notes on gonorrhoea and syphilis.
- Define congestive heart failure and write its pathophysiology.
- Write about inflammatory bowel diseases.
- Explain the signs and symptoms of gout.
- Explain about peptic ulcer disease.
- Calcification.
- Hypertrophy.
- Metaplasia.
- Atherosclerosis.
- Myocardial infarction.
- Megaloblastic anemia.
- Stroke.
- Osteoporosis.
- What are the Causes for Schizophrenia?
- Meningitis.
- Discuss the etiology, and pathophysiology of Hypertension.
- Describe on Pathophysiology of Acute renal failure and Chronic renal failure.
- Define Diabetes. And write the causes, symptoms and pathophysiology of Diabetes.
- Discuss about the Infections diseases.
- Write short notes on mechanism of cellular inflammation.
- Pathophysiology of Peptic Ulcer.
- Notes on Parkinson's disease.
- Enumerate on Pathophysiology Hepatitis.
- Etiology of cancer.
- Angina pectoris and their symptoms.
- Syphilis and Gonorrhoea.
- Discuss briefly about the various hormone disorders.
- Cytokines.
- DOT therapy.
- Signs of inflammation.
- Hypertrophy.
- Ketoacidosis.
- Hematuria.
- Atheroma.
- Sign of Schizophrenia.

- Gangrene.
- Give the risk factors for AIDS.
- Discuss about the various inflammatory mediators and their role in inflammatory process.
- Describe the etiology and pathophysiology of congestive heart failure.
- Elaborate on etiopathogenesis of iron deficiency anemia and megaloblastic anemia.
- Etiology of various types of viral hepatitis.
- Enumerate on pathophysiology of gout.
- Write a note on etiopathogenesis of AIDS.
- Define meningitis and write about different types of meningitis.
- Write a note on various stages of alcoholic liver disease.
- Enumerate on pathophysiology of Parkinson's disease.
- Write causes and pathogenesis of acute renal failure.
- Describe the different types of necrosis.
- Write about various stages of urinary tract infection.
- Define metaplasia with suitable example.
- Cause and prevention of Gonorrhoea.
- Write the causes of extrinsic asthma.
- List the etiology of peptic ulcer.
- Grave's disease.
- Write the causes of Osteoporosis.
- Classify inflammatory bowel disease.
- Define epilepsy.
- Causes and prevention of typhoid.
- What is wound healing?
- Describe on pathogenesis and morphology of Cell injury.
- Define Asthma. Write the causes, symptoms and pathophysiology of Asthma.
- Describe the etiology and pathophysiology of acute renal failure.
- Discuss about the various Mediators of Inflammation.
- Write notes on Epilepsy.
- Describe briefly on Rheumatoid Arthritis.
- Pathogenesis of Acquired Immunodeficiency Syndrome.
- Explain Homeostasis and the concept of Negative feedback.
- Enumerate on the Pathogenesis of Cancer.
- Discuss the mode of transmission and pathophysiology of Leprosy.
- Notes on Stroke and its etiology.
- Write notes on Meningitis.
- Haemolytic Anemia.
- Hyperplasia.
- Grave's disease.
- Various stages of Chronic Kidney Disease.
- Pathogenesis of Gout.
- Define Goitre.
- Acromegaly.
- Angiogenesis.
- Types of Acute Myocardial Infarction.
- Ejection fraction.

- Describe in detail the etiology and pathogenesis of Congestive Heart Failure.
- Elaborate on the pathogenesis, etiology and symptoms of any two Psychiatric Disorders.
- Discuss in detail the various disorders of Thyroid Gland.
- Write a note on Pathologic Calcification.
- Acute Myocardial Infarction and its pathogenesis.
- Discuss briefly on Gout.
- Enumerate on the pathogenesis of Asthma.
- Etiological causes of acquired and inherited Aplastic Anaemia.
- Write short notes on Irreversible Cell Injury.
- Notes on Chronic Inflammatory Cells and various secretions involved in Chronic Inflammation.
- Discuss about the pathogenesis and clinical complications of Rheumatoid Arthritis.
- Write notes on Acute Renal Failure.
- Types of Depression.
- Dysplasia.
- Homeostasis.
- Hypokalemia.
- Haemolytic Jaundice.
- Cushing's disease.
- Epilepsy.
- Hypertension.
- Meningitis.
- Glomerulonephritis.
- Describe the etiology, pathogenesis and complications of Ischemic Heart Disease.
- Elaborate on the etiology, symptoms and pathogenesis of Chronic Obstructive Pulmonary Disease.
- Discuss the different types of blood disorders. And write the causes, symptoms and pathogenesis of Sickle Cell Anaemia and Hemophilia.
- Discuss about the Cellular Adaptation.
- Pathogenesis of Alzheimer's disease.
- Discuss briefly on Osteoporosis.
- Enumerate on pathogenesis of Tuberculosis.
- Write note on Acute Inflammation.
- Write short notes on Intercellular Accumulations.
- Pathogenesis of Typhoid.
- Pathogenesis and complications of Peptic Ulcer.
- Notes on Urinary Tract Infections.
- Necrosis.
- Atrophy.
- Difference between dystrophic and metastatic calcification.
- Hypernatremia.
- Wound Healing.
- Extrinsic Asthma.
- Types of Jaundice.

- Haemorrhagic Stroke.
- Hepatitis B Virus infection.
- Clinical features of Leprosy.
- Define Inflammation. Explain in detail the process of Inflammation.
- Discuss the pathophysiology, causes and symptoms of congestive heart disease.
- Discuss the different types of epilepsy and its pathophysiology.
- Discuss about the types of Anaemia.
- Write the pathophysiology and treatment for peptic ulcer.
- Give the etiology and clinical features of ulcerative colitis.
- What is Rheumatoid Arthritis? Give its causes and symptoms.
- Write notes on types of urinary tract infections and its treatment.
- Give notes on any two sexually transmitted diseases.
- Explain about a disease of nervous system.
- Give notes on inflammatory Bowel disease.
- Discuss about pathophysiology of asthma.
- Atheroma.
- Angina.
- Myocardial infarction.
- Azotemia.
- Suppuration.
- Urolithiasis.
- Gout.
- Podagra.
- Proctitis.
- Thrombosis.

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI PATTERN SEMESTER VIII
PHARMA MARKETING MANAGEMENT

1. Define marketing? Describe the various functions and scope of marketing.
2. What is new product? Explain different stages of new product development.
3. What is detailing? Explain the purpose of detailing.
4. Explain nature and scope of pharmaceutical marketing.
5. Briefly explain the stages involved in market research.
6. What are the factors to be considered in pricing of pharmaceutical products? 4.
Mention the advantage and disadvantage of a wholesaler in distribution of
Pharmaceutical product.
5. Discuss the promotional strategies for OTC products.
6. Explain strategies used during introductory stage of PLC.
7. What is product mix?
8. Explain the different promotional techniques for pharma product.
9. Define communication and explain the process of communication.

List out four methods of pricing approaches.

7. What are the reasons responsible for a channel conflict?
8. What are online techniques for OTC products?
9. Differentiate “Marketing” and “Market”.
10. Define needs and wants.
11. What are me - too products?
12. Define advertisement.
13. What is NPPA?
14. Mention two services of wholesaler to the manufacture.
15. Write a note on medical exhibition.

B.PHARM. DEGREE EXAMINATION
PCI Regulation SEMESTER - I
SUBJECT - PHARMACEUTICAL ANALYSIS – I

- Explain various types of argentometric titrations with example.
- With the help of a neat diagram, explain the construction and working of dropping mercury electrode.
- Describe on types of errors and methods of minimizing errors.
- Briefly discuss on the limit test for iron.
- Briefly explain the theories of acid-base indicators.
- Discuss on Diazotization titration.
- Explain the general applications of conductometric titration.
- Explain the principle involved in the estimation of sodium benzoate.
- Describe on various steps involved in gravimetric analysis.
- Write the reactions with equation for the estimation of magnesium sulphate.
- Explain the principle and applications of cerimetry.
- Write the construction and working of calomel electrode.
- Explain on various solvents used in non aqueous titration.
- What is masking agent? Give an example.
- Distinguish between iodimetry and iodometry.
- Define titration curve.
- What is meant by half-wave potential? Write its significance.
- Give any two important applications of potentiometry.
- What is dichrometry?
- Define primary and secondary standards with example.
- Classify complexometric titrations with example.
- Write the Ilkovic equation and explain on each term.
- Mention the types of redox titrations.
- Explain the masking and de-masking agents in complexometric titrations.
- Write the principle of redox titration and give a note on indicators used in redox titration.
- Write in detail about the acid base concepts and buffer solutions with examples.
- Describe the construction and working of dropping mercury electrode with a diagram.
- Write a note on standardization of perchloric acid.
- Write a note on diazotization titrations.
- Explain choice of indicators in acid – base titrations.
- Give an account on the preparation and standardization of ceric ammonium sulphate.
- Write notes on pM indicators.
- Explain how you will determine calcium by gravimetric analysis.
- Explain neutralization curves with examples.
- Write the preparation and standardization of potassium permanganate.
- What is gravimetric analysis?
- What are chelating agents?
- What is co-precipitation and post precipitation?
- Werner's co-ordination number.

- Define precision.
- What is the advantage of modified Volhard's method?
- Define accuracy.
- What is primary standard? Explain with examples.
- Write the different techniques of analysis.
- What is permanganometry and Bromometry?
- Explain the principle and procedure involved in the assay of calcium gluconate.
- What is a neutralization curve? Explain the titration curves of strong acid with strong base and weak base.
- Explain in detail the construction and working of silver silver chloride electrode.
- Explain the principle of sulphate limit test.
- Preparation and standardization of 0.1M sodium hydroxide solution.
- Note on Mohr's method.
- Discuss the theory of redox titrations.
- What is masking? Write its significance in analysis.
- Explain the various types of currents of polarographic method.
- Preparation and standardization of 0.1N sodium thiosulphate solution.
- Explain the estimation of Barium sulphate by gravimetry.
- Write the basic concept of conductometric titrations.
- Write about quantitative and qualitative analysis.
- Explain the principle of back titration.
- What is a primary standard? Mention one e.g. and its ideal property.
- Define Amphiprotic solvents with e.g.
- Write two application of polarography.
- Nernst Equation.
- Preparation of 0.1N Oxalic acid.
- Write about personal errors.
- Mention the indicator electrode used in Potentiometry.
- Define Metal ion indicators with e.g.
- Write the principle and different types of titration involved in Conductometric titrations.
- Explain the concept of iodometry and iodimetry. Give the procedure for the Standardization of sodium thiosulphate solution using potassium iodate.
- Discuss the principle and application of : a) Redox titration b) Polarography
- Define complex. Give theory of complexometric titrations.
- Preparation and standardization of 0.05M Potassium permanganate.
- Explain in detail Cerimetry.
- Estimation of sodium chloride.
- Discuss the construction and working of rotating platinum electrode.
- Explain in detail sources of impurities in medicinal agents.
- Write the principle involved in limit test for lead.
- Discuss various steps involved in gravimetric analysis.
- Write short notes on significant figure.
- What are self indicators? Give examples.
- Solubility product.

- What are mixed indicators?
- What are primary and secondary standard substances? Give examples.
- Define standard deviation and give its formula.
- Explain Bronsted acid-base theory.
- Differentiate between internal and external redox indicators.
- Define Errors.
- Nernst equation.
- Define ligands.
- Define Diazotisation titration. Explain the basic principle, methods and applications of Diazotisation titration.
- What is Complexometric titration? Discuss in detail about various types of Complexometric titration with suitable examples.
- What are Reference Electrodes? Describe the construction, working, advantages and disadvantages of Standard Hydrogen Electrode and Calomel Electrode.
- Discuss the principle and procedure involved in Mohr's method.
- Write a brief note on pM indicators.
- Define Titration. Explain the choice of indicators in Acid-base titration.
- With the help of a neat diagram, explain the construction and working of Rotating Platinum Electrode.
- Define Gravimetric analysis. Write a note on Co-precipitation and Post precipitation.
- Explain the various types of solvents used in Non aqueous titration.
- Define Pharmaceutical analysis. What are the different methods of Expressing Concentration?
- Discuss the sources of impurities in medicinal agents.
- Write briefly about the preparation and standardisation of Potassium permanganate.
- What is Iodimetry?
- Define Buffer with examples.
- Define Error. Classify them.
- Write the principle of Polarography.
- Classify Redox indicator.
- Define Conductometric titration.
- What is Bromatometry?
- Define Limit test.
- What do you mean by Adsorption indicators? Give examples.
- Define Significant figure.
- Explain in detail about the following
- Sources of Impurities in Medicinal agents.
- Estimation of Sodium chloride by Mohr's method.
- What is Gravimetry? Explain the steps involved in Gravimetry.
- Write the principle of Complexometric titration. How will you estimate Magnesium sulphate and Calcium gluconate by Complexometry?
- Define Acids and Bases. Explain Neutralization curves in Acid-base titration.
- How will you estimate Barium sulphate?
- What are the various applications of Polarography?
- Discuss in detail about Modified Volhard's method.
- What are Non aqueous solvents? Explain the principle and procedure involved in the estimation of Sodium benzoate by Non aqueous titration.

- Write briefly about Diazotisation titration.
- Write a detailed note on the preparation and standardisation of Ceric ammonium sulphate.
- Describe the principle, reaction and procedure involved in the Limit test for Chloride.
- Explain the construction and working of Glass Electrode.
- Define Accuracy.
- Write any two applications of Potentiometry.
- Explain the principle of Redox titration.
- Define Half wave potential.
- What do you mean by Co-precipitation?
- Define Primary standard. Give example.
- Define Normality.
- What is Ilkovic equation?
- Define Indicators.
- What are Chelating agents?
- What are the different indicators used in Complexometric titration? Describe the use of Masking and Demasking agents in Complexometry.
- Describe in detail about the following
 - Volhard's method b) Fajan's method
- Discuss the construction, working, advantages and disadvantages of Dropping Mercury Electrode.
- Write briefly about the different types of Errors and methods to minimize the Errors.
- Explain the various steps involved in Gravimetric analysis.
- Write the principle, reaction and procedure involved in the Limit test for Iron.
- Describe in detail about the theories of Acid-base indicators.
- Discuss in detail about the applications of Conductometric titrations.
- Give an account on the preparation and standardization of Hydrochloric acid.
- Explain the principle and applications of Dichrometry and Iodimetry.
- Define Potentiometry. Discuss the construction and working of any one Indicator Electrode.
- How will you estimate Ephedrine HCl by Non aqueous titration?
- What do you mean by Molarity?
- Define Precipitation titration.
- What is Nernst equation?
- Define Migration current.
- What is Pharmacopoeia?
- Define Precision.
- What is Iodometry?
- List out types of solvents used in Non-aqueous titrations.
- Define Cerimetry.
- What are the advantages of Conductometric titrations?
- Briefly explain in detail about the construction of conductivity cell and applications of conductometry.
- Define Complexometric titration. Explain the Different types in detail.
- Discuss about the various steps involved in gravimetric analysis.
- Discuss about Silver –silver chloride electrode in potentiometry.
- Write the preparation and standardization of 0.02M Potassium permanganate.
- Describe about Neutralization curves.
- Write the applications of Polarography.

- Briefly describe about Mohr's method with limitation
- Write the principle and procedure involved in the assay of Sodium benzoate.
- Explain the theory of Redox titration and add a note about redox indicators.
- Discuss the principle and the procedure in the Limit test for Iron.
- Explain with the neat diagram of dropping mercury electrode (DME)
- Define Secondary standard with example.
- Write the preparation of 0.1M Perchloric acid
- What is Gravimetric Analysis?
- Define Precision.
- What is Bromatometry?
- What is Post-Precipitation?
- Write the importance of buffer in complexometric titration.
- Define Non-Aqueous titration with example.
- What are the sources of Error?
- Significant Figure.

B.PHARM. DEGREE EXAMINATION
PCI PATTERN SEMESTER III
PHARMACEUTICAL ENGINEERING

- Describe the construction, working principle, efficiency, merits and demerits of Fractional distillation.
- Discuss in detail Ball Mill.
- Write about the principle, construction, working and application of Freeze dryer.
- Describe various types of iron as material of construction.
- Cyclone Separator.
- Factors affecting size reduction.
- Sigma blade Mixer.
- Describe with a diagram 'Venturimeter'.
- Forced circulation evaporator.
- Different Sources of heat.
- Bernoulli's Theorem.
- Filter leaf.
- Convection.
- Heat interchangers.
- Applications of size separation.
- Centrifugation.
- What are the standard for sieves?
- Advantages of plastics.
- Filter aids.
- Define Corrosion.
- Calandria.
- Double cone blender.
- Explain the principle, construction, working, uses, merits and demerits of Climbing film evaporator.
- Discuss in detail Filter Press.
- Explain the theory behind Corrosion. How will you prevent and control Corrosion?
- Rota meter.
- Concepts of Boundary layer.
- Write briefly on mechanism of heat transfer.
- Propellers.
- Edge runner mill.
- Stainless steel as the material of pharmaceutical plant construction.
- Steam distillation.
- Materials used for plant construction.
- Super centrifuge.
- Turbulent Flow.
- What are the grades of powder?
- Write any two factors influencing Filtration.
- Lyophilisation.
- Homogenization.
- Define Filter Aids.
- Centrifugal effect.
- What is latent heat?
- Fourier's Law.

- Volatility.
- Describe the construction, working, advantages and disadvantages of Fluidized bed dryer.
- Explain about details of Steam distillation.
- Define Corrosion. Explain about type and theories of Corrosion.
- Orifice meter. 2.
Hammer mill.
- Mechanism of conduction.
- Silverion emulsifier.
- Filter leaf.
- Factors in rate of Evaporation.
- Any one size Separator.
- Non Perforated basket centrifuge.
- Factors affecting in materials for plant construction.
- Types of Manometers.
- Method of size reduction.
- Define Distillation.
- Equilibrium Moisture Content.
- Propellers.
- Heat exchangers.
- Define Mixing.
- Classify Filters.
- Application of Centrifugation.
- Classify Ferrous metals.
- Describe the mechanism and different modes of Stress applied in size reduction. Write the principle, construction and working of Fluid energy mill.
- Explain the Reynolds experiment & Bernoulli's theorem of fluid flow.
- Write about the principle, construction, working and application of FBD.
- Cyclone Separator.
- Mechanism of Filtration.
- Factors affecting size reduction.
- Planetary mixer.
- Multiple effects of Evaporator.
- Glass as the material of Pharmaceutical plant construction.
- Different sources of Heat.
- Explain Raoult's law of distillation.
- Basic of Material handling systems.
- Lyophilization.
- Critical moisture content.
- Applications of Centrifugation.
- Fourier's law.
- What are the standards for Sieves?
- Comminution.
- Filter media.
- Binary mixture.
- Calandria.
- Flash distillation.

- Define Filtration. Write in detail about Plate and Frame filter press.
- Explain about separation of mixture of components by fractional distillation using boiling point composition diagrams.
- Define Evaporation. Discuss about climbing film evaporator.
- Operational details of Ball mill.
- Rotary drum filter.
- Spray dryer.
- Silverson – Mixer emulsifier.
- Stainless steel as material of plant construction.
- Cyclone separator.
- Orificemeter.
- Factors influencing corrosion.
- Rotameter.
- Define Elutriation.
- Various grades of Powders.
- Darcy's law.
- Give suitable dryers for obtaining:
 - (i) Granular free flowing solids and (ii) Sticky pastes.
- Factors affecting Evaporation.
- Define Rectifying columns.
- Mechanisms of Solid mixing.
- Stefan-Boltzmann law.
- Uses of Plastics.
- Applications of Distillation.
- Explain the principle, construction, working and applications of orifice meter. 2. Explain principle construction and working of Silverson Emulsifier with neat Diagram.
- Explain in brief about types of corrosion and their prevention method.
- Reynolds number
- Explain in brief about ball mill with diagram.
- Air separator
- Explain the principle and working of a heat interchanger with a labeled diagram
- Explain in brief about multiple effect evaporators and its economy.
- Differentiate simple distillation with fractional distillation 7. Brief note on drying rate curve with explanation of each phase
- Briefly explain in detail about drum filter.
- Factors influencing selection of materials for plant construction
- Applications of size reduction
- Labeled diagram of cyclone separator
- Merits and demerits of Radiation method
- Differentiate between evaporation and distillation
- Types of fractionating columns
- Types of dryers
- Objectives of mixing
- Factors influencing filtration

- Applications of centrifugation
- Advantages of Non-metals in pharmaceutical plant construction

- Give the principle reaction involved in the limit test for Arsenic with a neat diagram of the apparatus used for it.
 - Define Radioactivity. How to measure radioactivity and explain the storage condition and precaution to be followed when handling radioactive substance?
 - Give the functions of major physiological ions used as electrolyte in the replacement therapy. Give the composition and uses of Oral rehydration salt.
 - What are antidotes? Give the preparation, properties, assay and uses of Sodium thiosulphate.
 - What are buffers? Give the types of buffers, preparation and stability of buffers used in pharmaceutical substances.
 - What are properties of α , β and γ rays?
 - What are Anti-microbials? Write the preparation and assay of Hydrogen peroxide.
 - Brief account about the Iodine and its solution.
 - What are expectorants? Give the preparation, properties, assay and uses of ammonium chloride.
 - Brief history of Indian Pharmacopoeia.
 - Write the sources of impurities in pharmaceutical substances.
 - Write about the principle and reaction involved in the limit test of chlorides.
 - Define radio isotopes.
 - Write about the formula of any two emetics.
 - Define cathartics and give the formula of sodium orthophosphate.
 - Write about the formula of any two antacids.
 - Write about the formula, properties and uses of Ferrous Gluconate.
 - What is the use of activated Charcoal?
 - What are dentrifices? Give the role of fluorides in dental products.
 - Define isotonicity.
 - Write about the formula, properties and uses of Calcium gluconate.
 - What are acidifiers with two examples?
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- Write the principle and reaction involved in the limit test for Iron. Write a note on Indian Pharmacopoeia.
 - Write about role of fluoride in the treatment of dental caries. Write a note on Zinc eugenol cement.
 - Define and classify antimicrobial with example. Write about the preparation, assay and uses of chlorinated lime.
 - Explain the methods of adjusting isotonicity.
 - Write about the preparation, assay and uses of calcium gluconate.
 - Explain the principle and reaction involved in the limit test for lead.
 - Define alum and gives the formula, properties and uses of potash alum.
 - Write a note on Sodium iodide - ^{131}I .
 - Write about the preparation, assay and uses of copper sulphate.
 - Define antacid and gives a brief note on combination of antacids.
 - Briefly describe physiological acid base balance.
 - Discuss about measurement of radio activity.
 - Define Haematinics and give example.
 - Write the formula and uses of potassium chloride.

- Define emetics and give one example.
 - Define Half life period.
 - Principle of limit test for sulphate.
 - Write the principle involved in assay of ammonium chloride.
 - Define astringent and give example.
 - Write about Poison.
 - Define buffer capacity.
 - Write the composition of oral rehydration salt?
 - Describe in detail about buffered isotonic solutions, methods of adjusting tonicity and measurement of tonicity.
 - a) Write a brief note on sources of impurities in pharmaceuticals.
 - b) Write the principle and reaction involved in the limit test for lead.
 - Define cathartic and discuss about the properties and uses of the followings:
 - a) Magnesium sulphate b) Sodium ortho phosphate c) Kaolin d) Bentonite
 - Discuss about the storage condition, precaution and handling of radioactive materials.
 - Write about the preparation, assay and uses of ammonium chloride.
 - Explain the principle and reaction involved in the limit test for iron.
 - Define alum and gives the formula, properties and uses of calcium carbonate.
 - Write a note on emetics.
 - Write about the preparation, assay and uses of ferrous sulphate.
 - Define radioactivity and gives a brief note on alpha, beta and gamma radiation.
 - Write about the preparation, assay and uses of chlorinated lime.
 - Discuss about the preparation, properties and uses of sodium bicarbonate.
 - Write the formula and uses of ferrous sulphate.
 - Write the assay of sodium thiosulphate.
 - Define cathartic and give example.
 - Write the principle involved in assay of sodium chloride.
 - Principle of limit test for chloride.
 - Define expectorant and give one example.
 - Give the assay of copper sulphate.
 - Write the formula and uses of potassium permanganate.
 - Define pharmacopoeia.
 - Write the ideal properties of antacid.
 - Discuss in detail about the apparatus and principle involved in the limit test for Arsenic.
 - Classify Antacid and write a note on acid neutralizing capacity of Aluminium Hydroxide gel. Give the preparation, assay and properties of any one Antacid.
 - a) Explain the role of Electrolytes in acid base balance.
 - b) Give the preparation, assay and uses of Sodium chloride.
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- Define Antidotes and write a note on sodium nitrite.
 - What are the precautions to be followed while handling radioactive materials?
 - Write notes on combination of Antacids.
 - Write the principle involved in the limit test for Iron.
 - Write the preparation, properties, assay and uses on Hydrogen peroxide.
 - Define the terms with examples.
 - a) Antacid b) Astringent c) Laxative d) Antiseptic e) Disinfectant.

- Define Haematinics. Write the method of preparation, assay and uses of Ferrous Sulphate.
- Give the precautions and pharmaceutical applications of radioactive substances.
- Describe about the Calcium carbonate.
- Define dentifrices with examples.
- Write a note on assay of ammonium chloride.
- Write the composition of Ringer's solution.
- Osmotic laxative.
- Define antidotes with examples.
- What are official compounds of iron?
- Radio opaque contrast medium.
- Write the role of fluoride in the dental caries.
- Boric acid + Glycerol →.
- Write a note on alum.
- (a) Classify Antacids and write a note on ideal properties of Antacids and combination of Antacids.
- (b) Give the preparation, assay and uses of Sodium bicarbonate.
- (a) Classify Antimicrobials with examples.
- (b) Write the preparation, assay and uses of Chlorinated lime.
- What are the Buffers? Write in detail about Buffered isotonic solutions and their use in Pharmaceutical formulations?
- Write the preparation, assay and uses of Ammonium chloride.
- What are the Properties of α , β and γ rays?
- Role of Fluorides in treatment of Dental caries with an example
- What are Emetics? Give the preparation, properties and uses of Copper sulphate.
- What are Haematinics? Write the method of preparation, assay and uses of Ferrous sulphate.
- Give the composition and uses of Oral Rehydration Salt.
- Give the properties and uses of the following. (a) Kaolin (b) Sodium ortho phosphate.
- Write short notes on Iodine and its Preparations.
- Write a note on Indian Pharmacopoeia.
- Principle involved in limit test of Iron.
- Define Cathartics and give an example.
- Define Buffer capacity.
- Define Half life period.
- Define Expectorant.
- Properties and uses of Potassium permanganate 7. Pharmaceutical application of Radioactive isotopes.
- Give the composition of Ringer solution.
- Properties and use of Sodium iodide
- Properties and uses of Aluminium hydroxide gel.
- What are Limit tests? Discuss in detail about the principle involved in the limit test of Iron.
- Discuss in detail the different methods used in the measurement of Radioactive substances with a note on their storage conditions.
- Write a detailed note on electrolytes used in Replacement therapy and importance of Oral Rehydration Salt (ORS).
- What are Antacids? Give the preparations, properties and uses of Sodium bicarbonate.
- Give the principle, and reaction involved in limit test of Chloride.

- Role of Fluorides in treatment of Dental caries.
- What are Antidotes? Give the preparation, properties and use of Sodium thio sulphate.
- Define the terms: (a)Expectorants (b)Laxatives (c)Astringents (d)Disinfectants.
- Give the properties and uses of the following. (a)Kaolin (b)Sodium ortho phosphate.
- Write short notes on Iodine and its preparations.
- What are Emetics ? Give the preparation , properties and use of Copper sulphate.
- Write a short note on sources of impurities in Pharmaceutical substances.
- What are Electrolytes?
- Any two applications of Radioisotopes.
- Give the properties and use of Ferrous sulphate.
- Write a note on Alum.
- Define Isotonicity.
- What are Acidifiers?
- Preparation and uses of Calcium carbonate.
- What are Haematinics?
- Define Buffer capacity.
- Properties and use of Potassium permanganate.
- (a) What is physiological Acid Base Balance?
- (b)Give the composition and uses of Oral Rehydration Salt.
- Write the method of preparation, assay and uses of (a) Sodium Chloride. (b) Ferrous sulphate.
- Write a detailed note on mechanism of Antimicrobials and highlight on the use of Iodine and its preparation as antimicrobials.
- Write the principle involved in the limit test of Sulphates.
- Write a note on Indian pharmacopoeia.
- Write about the preparation, assay and use of Calcium gluconate.
- What are Expectorants? Give the preparation, properties, assay and use of Ammonium chloride.
- Define Alum and give the formula, properties and uses of Potash alum.
- Write the preparation, properties, assay and uses of Chlorinated lime.
- Write short notes on Iodine and its preparations.
- What are Cathartics? Give the preparation and properties of Bentonite.
- What are Antidotes? Give the preparation, properties and uses of Sodium thiosulphate.
- Define Haematinics and give one example.
- Give the storage conditions of Radio isotopes.
- Define Astringent and give an example.
- Uses of Citric acid in the limit test of Iron.
- What is the use of activated Charcoal.
- Give the formula and use of (a)Calcium carbonate (b)Zinc eugenol cement.
- Define Dentifrice with example.
- Enumerate the ideal properties of Antacids.
- Give the principle involved in the limit test of Chloride.
- Define Osmotic laxative.
- Write the Principle and reaction involved in Modified limit test for chlorides and sulphates.
- Define Radioactivity and explain the properties of α , β and γ radiations with suitable storage and precaution conditions.

- Write the preparation involved in the Non-Electrolytic method of Hydrogen Peroxide with Assay and uses.
- What is the importance of Buffers in Pharmacy?
- Add a note on ideal properties of Antacids.
- Write a note on Role of fluoride in the treatment of Dental caries.
- Briefly discuss about history of Pharmacopoeia.
- What is the composition and uses of Oral Rehydration salts?
- Give the Preparation, Assay and Uses of Ammonium Chloride.
- Define Haematinics and give the preparation and uses of Ferrous Sulphate.
- What are the methods involved in adjusting Isotonicity.
- Define Radioisotopes and Half life period of radioactivity.
- Define Cathartics.
- Give the storage conditions of Radio isotopes.
- Define Astringent and give an example.
- Uses of Citric acid in the limit test of Iron.
- Define Antidote.
- Limit Test.
- Define Magaldrate.
- Define Electrolytes
- Give the principle involved in the limit test of Chloride.
- Define Antimicrobials agent.

B.PHARM. DEGREE EXAMINATION
PCI PATTERN – SEMESTER V
PHARMACEUTICAL JURISPRUDENCE

- Explain in detail about the constitution and function of state pharmacy council.
- Describe in detail about Institutional Animal Ethical Committee and CPCSEA guidelines for Animals breeding.
- Give an account of Import and Export of Narcotic drugs and psychotropic substances.
- Education regulation.
- Code of Ethics of Pharmacist relation to his profession.
- Registration procedure for Pharmacist after formation of state pharmacy council.
- Discuss the rule relating to import of drugs as per drugs and cosmetics Act.
- Conditions for grant of license for wholesale of schedule C and C1 drugs.
- Classes of prohibited advertisements.
- Export of alcoholic preparations under bond.
- Retail price of formulation calculation under drug price control order.
- Prices of Bulk drugs calculation under drug price Control Order.
- Central register.
- Schedule H.
- Adulterated drugs.
- Labeling condition for ophthalmic preparations.
- State the advisory agency as per drugs and cosmetics Act.
- Qualification of Drug Inspectors.
- Misbranded cosmetics.
- Define Ayurvedic and Unani drugs.
- Registered Medical Practitioner.
- Schedule 'X' Drugs.
- Explain in detail about the Constitutions and functions of Joint State Pharmacy Council.
- Describe in detail about manufacture in Non bonded laboratory.
- Give an account on qualification and duties of government analyst.
- Labeling and packing of Schedule X drugs.
- Code of Ethics of Pharmacist relation to his job.
- Registration of Pharmacist.
- Repacking Licences and their conditions.
- Classes of drugs prohibited to sale.
- Classes of exempted advertisements.
- Export of duty paid alcoholic preparations.
- Mention the operations controlled by the central government under Narcotics and psychotropic substances.
- Salient features of Rights to information Act.
- Subsequent registers.
- Schedule C and C1.
- Spurious drug.
- Labeling condition for Schedule G.

- State the administrative agencies as per Drugs and Cosmetics Act.
- Define magic remedies.
- Schedule J.
- Define Psychotropic substances.
- Chemists and Druggists.
- Define Manufacture of drugs.
- Discuss about the conditions of license for manufacture of drugs for test, examination and analysis.
- Write a note on in bond and outside bond manufacturing.
- Write in detail about the medical termination of pregnancy act, 1971.
- What are the conditions for the issue of import license?
- Discuss about the compositions of Drugs Technical Advisory Board.
- Explain the functions of state and joint state pharmacy council.
- Explain the procedure to sale and export of opium.
- What are the offences and penalties of drugs and magic remedies act.
- Write about the sales prices of bulk drugs fixed as per DPCO.
- Write a brief review on Hathi committee.
- Give a note on Pharmacist oath.
- Discuss the powers and functions of information commission.
- Define the term misbranded and adulterated drug.
- Explain the term new drug.
- What are functions of drugs consultative committee?
- What is central register?
- What are Exempted advertisements?
- Give the main objectives of DPCO 2013.
- Write the scope of pharmaceutical legislations.
- Define magic remedies.
- What is third party license?
- Define trademark.

B.PHARM. DEGREE EXAMINATION
PCI PATTERN SEMESTER III
PHARMACEUTICAL MICROBIOLOGY

- Discuss various preservation methods of Pure culture.
- Give a detailed note on cultivation of Viruses in laboratory.
- Explain the types of Laminar air flow equipment and its operating principles with suitable diagram.
- Explain briefly about the structures internal to bacterial cell wall with diagram.
- Write the principle and procedure of Gram staining method.
- Indole production test.
- Write a note on Radiation sterilization.
- Classification of Fungi.
- Explain briefly about the various factors influencing disinfectant action.
- What is Minimum Inhibitory Concentration? Explain the assay of Antibiotics by Turbidimetric method.
- Write a note on various sources and types of Microbial contaminants.
- Application of Primary cell culture.
- Tyndallization.
- Classification of bacteria based on temperature.
- Use of culture media.
- Principle of Acid fast staining method.
- Dry heat sterilization.
- What is Chick-Martin test?
- Distinguish Antiseptics and Disinfectants.
- Give the principle of Microbial assay.
- Any two factors affecting Microbial spoilage.
- Transformed cell culture.
- Explain how microscopic methods (staining techniques) help in the identification of micro-organism.
- Explain the different factors affecting the microbial spoilage of pharmaceutical products.
- Explain the importance of sterilization indicators used for the evaluation of the efficiency of sterilization methods.
- Explain the classification of disinfectant.
- Scope and application of Microbiology.
- State the methods of preservation of microbial cultures.
- Microbial assay of Antibiotics.
- Explain about moist heat sterilization.
- Write on sterility test of pharmaceutical products.
- Define Phenol coefficient test. Explain Chick Martin's test.
- Classify micro-organisms depending on temperature with examples.
- Explain the principle, procedure and interpretation of Voge-Proskauer test.
- List the functions of bacterial capsule.
- Mycolic acid.
- Unique property of agar as a solidifying agent.
- Sex pili.
- Growth curve.

- Add a note on distribution pattern of flagella.
- Define sanitizers and Antiseptic.
- Membrane filter.
- Give two examples each of fungicidal and virucidal agents.
- Primary cell culture.
- Define Sterilization and explain in detail about Sterilization by Radiation and Chemical agents.
- Discuss Microbiological assay of Antibiotics.
- Explain the evaluation of Disinfectants.
- Describe the nutritional requirements and physical conditions required for Bacterial growth.
- Explain viable count of Bacteria.
- Explain about the Lytic cycle.
- Explain in detail about the factors influencing disinfection action.
- Discuss the different sources of contamination in an Aseptic area.
- Explain in detail about media used for Animal cell culture.
- Explain the types of Microbial spoilage.
- Describe the Gram staining technique with examples.
- Explain about Sterility indicators.
- Define Generation time with examples.
- What is Fumigation?
- Define Bacteriophage.
- Give examples for Acid-fast bacteria.
- Laminar Air Flow.
- What are the media used for Sterility test?
- Classify Bacteria based on flagella arrangements.
- Define Cell line with examples.
- Give examples of preservatives used for the preparation of pharmaceutical products.
- What is moist heat sterilization?
- What is Differential staining? Explain in detail about the Acid fast staining method.
- Define Disinfectants. Classify them and give a descriptive note on mode of action of disinfectants.
- What is Spoilage? Write down the various factors affecting the spoilage of Pharmaceutical products.
- **II. Explain the morphological classification of Bacteria with suitable diagram.**
- Explain briefly about the nutritional requirements of Bacteria.
- Cultivation method of Anaerobes.
- Methyl Red test.
- Write a note on Moist heat sterilization method.
- Explain Phenol coefficient test?
- Explain briefly about the different sources of contamination in an Aseptic area.
- Assay of Antibiotics by cup plate or cylinder plate method.
- Give the applications of cell cultures in Pharmaceutical industry and Research.
- Prokaryotes.
- Functions of Pili.
- Endospores.

- Generation time.
- Physical Indicators.
- Disinfectant.
- List some sterile Pharmaceutical products.
- What is Sterility test?
- Give any two importance of Aseptic technique.
- Classification of Clean area.
- Draw and describe the structure of Bacteria and give the function of each part.
- Define Disinfectant. Describe factors affecting the choice of Disinfectant.
- What are different methods of Sterilization? Explain in detail about filtration sterilization and give its applications.
- Differentiate between Gram +ve and Gram -ve bacterial cell.
- Explain the principles and method of Microbiological assay of Antibiotics.
- Explain the Bacterial growth curve with a neat diagram.
- What are enriched, selective, and differential media? Give example for each.
- Sources of contamination in Aseptic area.
- Designing of Aseptic area.
- Preservation of pharmaceutical products.
- Electron microscopy.
- Write the preservation methods of pure Culture.
- Differentiate between Slime layer and Capsule.
- Write the significance of Flagella.
- Rideal-Walker test.
- Sporulation.
- State the reason for using cedar wood oil under 100x objective.
- D-Value.
- Acid fast stain.
- Pasteurization.
- Bacteriophage.
- Biological indicators.
- Define sterilization. Explain physical method of sterilization.
- What is a disinfectant? Evaluation of bacteriostatic disinfectants.
- Draw and describe the Morphology of Bacteria and give the function of each part of Bacteria
- Electron microscopy
- Types of spoilage
- Principle of gram staining technique
- Sterilization by Filtration
- IMViC test
- Bacterial Growth curve
- Isolation of pure culture technique
- Sterility indicators
- Life cycle of virus
- Spore
- Contamination
- Flagella

- Fumigation
- Physical indicators
- Grams staining
- Virus
- Viable count
- Fungi
- Biological indicators.