III/IV B.PHARMACY (5th Semester)

501 PHARMACEUTICAL CHEMISTRY-IV (MEDICINAL–II)

(Theory) (75 hrs.)

Unit : 01

Quantitative structure activity relationship (QSAR) studies, basic concepts of computer aided drug design, different drug design approaches, basic concepts of combinatorial synthesis.

Unit : 02

General Anaesthetics : Introduction, classification, mechanism of action, synthesis and therapeutic uses of halothane, ketamine, methohexital.

Local Anaesthetics : Introduction, chemical classification, ideal requirements, mode of action, SAR, structures of important local anaesthetics, metabolism and synthesis of benzocaine, procaine, lidocaine, tetracaine and cinchocaine.

Hypnotics and Sedatives – SAR of barbiturates, synthesis, metabolism and therapeutic uses of phenobarbital, amylobarbital, pentobarbital, cyclobarbitone calcium, thiopental, hexobarbital. chlordiazepoxide, diazepam, alprazolam.

Anti-psychotics – SAR of phenothiazines, synthesis and therapaeutic uses of promethazine, Prochlorperazine, Fluphenazine, chlorpromazine, haloperidol, clozapine, oxypentine.

Anti– depressants: Synthesis and therapaeutic uses of amitryptaline, doxepine, iproniazid, isocarboxizide, trazodone, fluoxetin

Anti – Anxietyagents : Synthesis and therapaeutic uses of nitrazepam, lorazepam, prazepam

Anti-epileptics – Synthesis and therapaeutic uses of phenytoin, valproic acid, carbamazepine, ethosuximide.

Unit : 03

Drugs affecting adrenergic mechanism : Adrenergic receptors, biosynthesis of catecholamines, chemical classification along with structures, S.A.R of adrenergic drugs, adrenergic agonists, adrenergic blockers. Synthesis and therapeutic uses of phenylephrine, ephedrine, naphazoline, terbutaline, dopamine, amphetamine, phenoxybenzamine, propranolol, metaprolol, atenolol, tolazoline.

Drugs affecting cholinergic mechanism: Introduction, SAR, cholinergic receptors, study of cholinergic agonists, indirectly acting cholinergic agonists, cholinergic blocking agents, neuromuscular blocking agents. Synthesis and therapeutic uses of methacholine, carbachol, neostigmine, pralidoxime, propantheline, dicyclamine, tropicamide, atropine, bipyridine.

Unit : 04

Cardiovascular Agents: Introduction, classification, mechanism of action of antianginal agents, calcium channel blockers, Anti-arrhythmic drugs, antihypertensive agents, antihyperlipidemic agents and anticoagulants. Synthesis and therapeutic uses of methyldopa, amlodipine, clonidine, hydralazine, verapamil, clofibrate, dicoumorol, warfarin

Hypoglycaemics : General account on pancreatic malfunctions. chemical classification, S.A.R of hypoglycemics, Insulin preparations, a brief account on statin antidiabetics – phenformin, glipizide, chlopropamide, including a brief account on PPARγ inhibitors, meglitinide analogues, α-glucosidase inhibitors–Acarbose, miglitol. A brief account on thyroid and antithyroid drugs.

Unit : 05

Opoid Analgesics : Classification along with structures, mechanism of action, S.A.R of opioid analgesics, mixed agonists and mixed antagonists, central and peripheral acting anti tussive agents. Structure and therapeutic uses of morphine, codeine, diacetylmorphine, nalorphine, levalophan, noscapine, dextromethorphan.

NSAIDS (Non-steroidal anti-inflamatory agents) : Introduction and types of pain and inflammation. Synthesis, metabolism and therapeutic uses of aspirin, paracetamol, ibuprofen, mefenamic acid, diclofenac, piroxicam. A brief account on Cox-2 inhibitors.

Unit : 06

DIURETICS : Introduction, chemical classification along with structures, mechanism of action, S.A.R, metabolism and synthesis of acetazolamide, benzthiazide, furosemide, ethacrynic acid chlorthiazide, hydrochlorthiazide and amiloride.

Antihistaminic agents : Introduction, histamine receptors, biosynthesis of histamine, study of H1 and H2 antagonists. Chemical classification along with structures, mechanism of action, S.A.R, of antihistamines. Synthesis and metabolism of diphenhydramine, pyrilamine, mepyramine, cyclizine pheninramine, promethazine, antazoline, astimizole, cetrizine, cimetidine.

Diagnostic agents : Introduction, structures and therapeutic uses of some important organic compounds as diagnostic agents. Synthesis of iopanoic acid, fluorescein, diatriazoic acid and metyrapone

III/IV B.PHARMACY (5th Semester)

502 PHARMACEUTICAL CHEMISTRY–IV

(MEDICINAL-II) (Practicals) (75 hrs.)

01*. Assay of indomethacin capsules – I.P.
02*. Assay of glipizide/frusemide tablets – I.P.
03*. Assay of ibuprofen suspension – I.P.
04*. Assay of paracetamol elixir/tablet – I.P.
05. Assay of ascorbic acid tablets – I.P.
06*. Assay of salicylic acid ointment – I.P.
07*. Assay of aminophylline injection - I.P.
08. Assay of metronidazole tablets – I.P.
09*. Synthesis of benzil from benzoin
10. Synthesis of benzillic acid from benzil
11. Synthesis of 7-hydroxy 4-methyl coumarin
12. Synthesis of benzimidazole
13*. Synthesis of benzocaine
14*. Synthesis of benzotriazole
15. Synthesis of aspirin
16*. Synthesis of phenytoin (5, 5' – diphenyl hydantoin)
17. Synthesis of sulphanilamide.

TEST BOOKS

1. Text book of Medicinal Chemistry by William O. Foye, Lea Febiger, Philadelphia. Wilson & Giswold's Text book of organic Medicinal Chemistry and pharmaceutical chemistry by JH Block & JM Beale (Eds), 11th Ed, Lipcott, Raven, Philadelphia, 2004.
2. D. Abraham (Ed), Burger Medicinal chemistry ad Drug discovery, Vol. 1 & 2. John Wiley & Sons, New York 2003, 6th Ed.
3. Lippincott Williams and Wilkins: Remington Pharmaceutical Sciences; 20th Edition.
4. Bentley and Driver's Textbook of Pharmaceutical Chemistry Ed: l. M. Atherden. Oxford University Press, Delhi.
5. B.N. Lads, MG.Mandel and F.I. way, Fundamentals of drug metabolism & disposition, William & welking co, Baltimore USA.
6. Hansch, Comprehensive medicinal chemistry, Vol 1 – 6 Elsevier pergmon press, Oxford
7. Rama Rao Nadendla, Principles of Organic Medicinal chemistry, Vol-I, New-Age International Publishers Pvt., limited, New Delhi, 2005
8. Daniel lednicer, Strategies For Organic Drug Synthesis And Design, John Wiley, N. Y. 1998.
9. D. Lednicer, Organic drug synthesis, Vol, 1 – 6, J.Wiley N.Y.

III/IV B.PHARMACY (5th Semester)

MODEL QUESTION PAPER

501 PHARMACEUTICAL CHEMISTRY-IV (MEDICINAL-II) (Theory)

Time : 3 hours Max.Marks : 80

SECTION-A

Answer any four questions (4 X 10 = 40 marks)

1. Add a note on different drug design approaches. Give a detailed account of computer aided drug design.
2. Classify sedatives and hypnotics with suitable examples. Write the SAR and mode of action of Barbiturates.
3. Outline the chemical classification of adrenergic drugs. Discuss their mode of action and SAR.
4. What are oral hypoglycemic agents ? Classify them with examples and write their mode of action.
5. Classify the non-steroidal anti inflammatory agents with examples and discuss their mode of action ? How do you synthesize diclofenac and piroxicom ?
6. Classify H1 antagonists with examples ? Discuss the SAR and mechanism of action of these drugs.

SECTION - B

Answer any TEN questions (10 X 4 = 40 marks)

7. Write short notes on Free Wilson analysis
8. Short notes on descriptors used in QSAR
9. Outline the synthesis and therapeutic uses of phenytoin.
10. Mechanism of action of MAO inhibitors.
11. Short notes on cholinergic receptors.
12. Give the synthesis and mechanism of propantheline.
13. Write short notes on antianginal agents.
14. Outline the synthesis of clonidine
15. Discuss the mode of action of opioid analgesics
16. Short notes on opioid antagonists
17. Write the SAR and mode of action of thiazide diuretics.
18. Add a note on synthesis and metabolism of cetrizine.

III/IV B.PHARMACY (5th Semester)

MODEL QUESTION PAPER (Practicals)

502 PHARMACEUTICAL CHEMISTRY-IV (MEDICINAL-II)

Time : 4 hours Max.Marks : 80

1.	Synopsis	:	10 Marks
2*.	Major Experiment	:	35 Marks
3.	Minor Experiment	:	20 Marks
4.	Viva-Voce	:	15 Marks
		Total:	80 Marks

III/IV B.PHARMACY (5th Semester)

503 PHARMACEUTICS-II

(DOSAGE FORM TECHNOLOGY INCLUDING COSMETICS)

(Theory) (75 hrs.)

Unit : 01

Formulation : Physical chemical and therapeutic factors involved in the formulation of dosage forms. Introduction to preformulation studies. Formulation additives in solid, semi-solid and parenteral dosage forms .

Unit : 02

A study of the principles, formulation, manufacturing process, equipment and quality control of the following dosage forms.

Liquid orals – Manufacture and quality control of solutions, emulsions and suspensions.

Semi-solids : Ointments, creams, pastes, jellies-Definitions, Ideal requirements, types of bases, selection of base, typical examples.

Unit : 03

A study of the principles, formulation, manufacturing process, equipment and quality control of the following dosage forms.

Solids : Powders-Types, Typical examples.

Compressed tablets Types, Formulation additives, Formulation, manufacture and quality control of tablets - Examples (I.P.) Processing problems

Capsules : Hard and soft-Formulation, manufacture and their quality control.

Tablet coating : Purpose, sugar, film and enteric coating methods

Unit : 04

Parenterals : Definitions, Types, Formulation aspects, production facilities, layout, manufacturing and quality control, Typical examples from I. P.

Opthalmic preparations : Eye ointments, Eye drops, requirements

Formulation, manufacture and quality control- I.P. and other important products.

Unit : 05

Pharmaceutical Aerosols : Definition, classification, formulation, propellents, pressurized packagings, applications.

Radiopharmaceuticals : Therapeutic and diagnostic uses. Production of radio pharmaceuticals – care in handling.

Unit : 06

Cosmetics : A study of formulation, manufacture and evaluation of cleaning creams, nail lacquers and nail polish removers, deodorants and antiperspirants, shampoos, hair bleaches and depilatories, shaving creams.

504 PHARMACEUTICS – II
(DOSAGE FORM TECHNOLOGY INCLUDING COSMETICS)
(Practicals) (75 hrs.)

01*. Formulation of an anti-pyretic liquid oral for a child below ten years.
02. Formulation of paediatric liquid oral of ibuprofen
03. Formulation of paediatric liquid oral of amoxycillin
04. Formulation of an antacid liquid oral
05*. Manufacture of dummy lactose tablets
06. Quality control tests of dummy lactose tablets
07*. Manufacture of calcium phosphate tablets
08. Manufacture of chewable antacid tablets
09*. Manufacture of ibuprofen-tablets by direct compression.
10. Manufacture of aqueous cream base
11*. Formulation of piroxicam capsules.
12. Quality control tests for capsules.
13. Manufacture of sodium alginate jelly
14. Manufacture of piroxicam jelly
15. Manufacture of sodium CMC lubricating jelly
16. Manufacture of dextrose ampoules by terminal sterilization.
17. Manufacture of $NaNO_3$ ampoules by terminal sterilization.
18. Disintegration test for different types of tablets.
19*. Dissolution test for tablets.
20. Formulation and evaluation of antidandruff shampoo.

TEXT BOOKS :

01. Theory and Practice of Inustrial Pharmacy by Lachman
02. Bentley's Text Book of Pharmaceutics
03. Remington's Pharmaceutical Sciences
04. Pharmaceutical Dosage Forms – Tablets by H.A.Liberman
05. Modern pharmaceutics by Banker
06. Pharmaceutics by Aulton
07. Encyclopedia of Pharmaceutical technology by Swarbrick
08. Cosmetic science and technology by Sagarin
09 Cosmetics - Manufacture, Formulation and Quality control - P.K.Sharma.

III/IV B.PHARMACY (5th Semester)

MODEL QUESTION PAPER

503 PHARMACEUTICS-II (Theory)

(DOSAGE FORM TECHNOLOGY INCLUDING COSMETICS)

Time : 3 hours Max.Marks : 80

SECTION - A

Answer any four questions (4 X 10 = 40 marks)

1. Discuss the physico-chemical factors involved in the preformulation of solid dosage forms.
2. What are the ideal requirements of ointment bases ? Classify ointment bases with examples.
3. What are different methods used in manufacture of tablets ? Explain about wet granulation process.
4. Describe the facilities for commercial production of parenterals with neat layout
5. What are the advantages of aerosols. With a neat sketch. Explain the metering valve for pharmaceutical aerosols.
6. Classify shampoos. Write down the ideal requirements of shampoos.

SECTION - B

Answer any TEN questions (10 X 4 = 40 marks)

7. Write a note on additives used in tablet dosage forms.
8. Explain the significance of the preformulation studies.
9. Write a note on controlled flocculation.
10. Explain the evaluation tests for emulsions.
11. Explain about sugar coating.
12. Explain about Softgels
13. Write a note on opthalmic preservatives.
14. Write any 2 evaluation tests for parenterals.
15. Explain about handling of Radio pharmaceuticals.
16. Write a note on evaluation tests for aerosols.
17. Write a short notes on depilatories.
18. Write a short notes on formulation of nail polish removers.

III/IV B.PHARMACY (5th Semester)

MODEL QUESTION PAPER (Practicals)

504 PHARMACEUTICS-II

(DOSAGE FORM TECHNOLOGY INCLUDING COSMETICS)

Time : 6 hours Max.Marks : 80

1.	Synopsis	:	10 Marks
2*.	Major Experiment	:	35 Marks
3.	Minor Experiment	:	20 Marks
4.	Viva-Voce	:	15 Marks

		Total:	80 Marks

III/IV B.PHARMACY (5th Semester)

505 PHARMACOGNOSY-1 (Theory) (75 hrs.)

Unit : 01

Definitions, history, scope and development of pharmacognosy. Sources of natural drugs, organized and unorganized drugs. Different methods of classification of crude drugs.

Unit : 02

Cultivation, collection, processing and storage of crude drugs. Factors influencing cultivation of medicinal plants. Types of soils and fertilizers of common use. Pest management and natural pest control agents. Plant hormones and their application. Polyploidy, mutation and hybridization with reference to medicinal plants.

Unit : 03

Quality control of crude drugs : Adulteration of crude drugs and their detection by organoleptic, microscopic, physical, chemical and biological methods of evaluation.

Unit : 04

Systematic pharmacognostic study (microscopical characters, varieties, adulterants, substituents, principle constituents and uses) of the following

1. **Carbohydrates and derived products :** Agar, guar gum, gum acacia, honey, isabgol, pectin, starch, sterculia and tragacanth
2. **Proteins and enzymes:** Gelatin, papain, yeast.
3. **Tannins:** Arjuna, black catechu, gambier catechu.

Unit : 05

Study of fibres used in pharmacy such as asbestos, cotton, glass- wool, nylon, polyster, silk and wool.

Resin and Resin combinations : Asafoetida, balsam of peru, balsam of tolu, benzoin, cannabis, capsicum, ginger, guggel, jalap, myrrh, podophyllum, storax, turmeric.

Unit : 06

An introduction to biogenesis of primary and secondary metabolities of pharmaceutical importance

III/IV B.PHARMACY (5th Semester)

506 PHARMACOGNOSY – I (Practicals) (75 hrs.)

01. Identification of Carbohydrates (Agar, Acacia, Starch, Honey, Tragacanth, Guargum, Pectin, Isabgol), Tannins (Black catechu), Resins (Benzoin, Asafoetida, storax, myrrh), Fibres (absorbent cotton, non-absorbent cotton, silk and wool) by general and specific chemical tests.
02. **Cellular Structures :**
    - i. Measurement of length and width of phloem fibres in powdered crude drugs, (Cinchona & Cinnamon)
    - ii. Measurement of starch grains (Ginger and Potatostarch)
    - iii. Measurement of calcium oxalate crystals (squill)

03. Determination of Leaf constants

- i*. Determination of stomatal number and stomatal index (Datura and Senna)
- ii*. Determination of veinislet number
- ii. Determination of swelling factor of the given seeds (Isabgol)
- iv. Determination of ash value.
- v*. Determination of Palisade ratio

04 **Identification of crude drug by organoleptic and morphological characters :** Fibres (Cotton, Wool, Silk), Carbohydrates (Agar, Isapgol, acacia, tragacanth, Honey) , Proteins & Enzymes (Yeast), Tannins (Black catechu, Arjuna), Resins (Benzoin, Myrrh, Asafoetida, Turmeric, Ginger, Jalap, Podophylum.)

05. Determination of extractive value of crude drug
06. Extraction of eucalyptus oil

TEXT BOOKS :

01. Text book of Pharmacognosy by T.E.Wallis.
02. Text book of Pharmacognosy by Trease and Evans
03. Text book of Pharmacognosy by C.K.Kokate
04. Cultivation of Medicinal and Aromatic crops by A A Farooqui and B.S.Sree ramu
05. Pharmacognosy and Phytochemistry by Dr.Vinod Rangari,
06 Pharmacognosy and phytochemistry by Ashutoshkar.
07. Essentials of Pharmacognosy by Dr.S.H.Ansari.
08. Pharmacognosy and phytochemistry by Brady & Talyr
09. Text book of Pharmacognosy by S.S.Handa and V.K.Kapoor.

III/IV B.PHARMACY (5th Semester)

MODEL QUESTION PAPER

505 PHARMACOGNOSY - I (Theory)

Time : 3 hours Max.Marks : 80

SECTION - A

Answer any four questions (4 X 10 = 40 marks)

1. Define crude drug and write the differences between organized and unorganized crude drugs.
2. Write in detail about endogeneous factors affecting cultivation of medicinaland aromatic plants.
3. Enumerate the physical methods of crude drug evaluation.
4. Write the systematic pharmacognostic study of gum acacia.
5. Write the applications of pharmaceutical fibres.
6. Give an account of biosynthetic pathways for the formation of important alkaloids.

SECTION - B

Answer any TEN questions (10 x 4 = 40 marks)

7. Write in brief about various sources of crude drugs.
8. Write the chemical classification of crude drugs.
9. Discuss the importance of sort and soil fertility in the cultivation of medicinal and aromatic plants.
10. Classify plant harmones and write the applications of gibberellins in cultivation technology.
11. Enumerate the methods of crude drug adulteration with examples.
12. What is micrometry and write its significance in the evaluation of crude drugs.
13. Define carbohydrates, write the biological source and uses of tragacanth
14. Write the chemical constituents and uses of gelatin and arjuna.
15. Differentiate wool and silk
16. Method of preparation of surgical cotton.
17. Explain the biosynthesis of indole alkaloids.
18. Write the biological source and chemical constituents of storax and asafoetida.

III/IV B.PHARMACY (5th Semester)

MODEL QUESTION PAPER (Practicals)

506 PHARMACOGNOSY-I

Time : 6 hours Max.Marks : 80

1.	Synopsis	:	10 Marks
2*.	Major Experiment	:	35 Marks
3.	Minor Experiment	:	20 Marks
4.	Viva-Voce	:	15 Marks

		Total:	80 Marks

III/IV B.PHARMACY (5th Semester)

507 PHARMACOLOGY-I (Theory) (75 hrs.)

Unit : 01

General Pharmacology and pharmacodynamics : Factors influencing the effect of drugs. The Dose –effect relationship, Introduction to LD_{50} and ED_{50}, therapeutic index. General mechanism of drug action, Structure activity relationship, drug receptors, drug toxicity and drug allergy.

Unit : 02

Pharmacology of drugs acting on autonomic nervous system: Parasympathomimetics, parasympatholytics, sympathomimetics, sympatholytics, neuromuscular blocking agents and ganglionic blockers.

Unit : 03

Pharmacology of drugs acting on central nervous system : Synaptic transmission in the CNS; General anaesthetics, hypno-sedatives, analgesics, antipyretics and anti-Inflammatory agents.

Unit : 04

Pharmacology of drugs acting on central Nervous system : Antiepileptics, antiparkinsonian drugs, psycho- pharmacological agents, CNS stimulants, hallucinogens and drugs used in gout

Unit : 05

Pharmacology of drugs acting on Gastro –intestinal system : Purgatives, Antidiarrhoeal drugs, treatment of peptic ulcer, emetics and anti- emetics.

Unit : 06

Pharmacology of local anaesthetics and diuretics.

TEXT BOOKS :

01. Goodman and Gilman - The Pharmacological Basis of Therapeutics.
02. Textbook of Pharmacology by Rang and Dale
03. Quientessence of Medical Pharmacology by C.Chowdary.
04. Lippincott's illustrated reviews - Pharmacology by Richard D.Howland and Mery J.Mylek.
05. Essentials of medical pharmacology by K.D.Tripathi.
06. Pharmacology and Pharmacotherapeutics by R.S.Satoskar, S.D.Bhanderkar and S.S.Ainapure.

III/IV B.PHARMACY (5th Semester)

MODEL QUESTION PAPER

507 PHARMACOLOGY-I (Theory)

Time : 3 hours Max.Marks : 80

SECTION - A

Answer any four questions (4 X 10 = 40 marks)

1. Discuss the mechanisms of drug action with suitable examples.
2. Classify cholinesterase inhibitors with suitable examples and discuss about the management of organophosphorous poisoning.
3. Classify the anti inflammatory drugs with suitable examples and discuss the pharmacology of salicylates.
4. Classify antidepressants. How do tricyclic antidepresants act ? Write their clinical usefulness.
5. Classify and discuss the various drugs that are used in peptic ulcer. Add a note on proton-pump inhibitors.'
6. Classify diuretics with suitable examples and discuss the mechanism of action and adverse effects of furosemide ?

SECTION - B

Answer any TEN questions (10 x 4 - 40 marks)

7. Describe briefly dose-effect relationship.
8. Explain antagonism with examples.
9. Write short notes on neuromuscular blocking drugs.
10. Discuss the mechanism of action and therapeutic uses of adrenaline.
11. Write notes on benzodiazepines.
12. Add a note on endogenous opioid peptides.
13. Write short notes on L-Dopa.
14. Describe the mechanism of action and mention the therapeutic uses and toxicities of phenytoin.
15. Add a note on emetics.
16. Write notes on pharmacology of allopurinol .
17. Describe the mechanism of action and therapeutic uses of cocaine.
18. Discuss different routes of administration of local anesthetics.

III/IV B.PHARMACY (6th Semester)

601 PHRAMCEUTICL ENGINEERING-II

(Theory) (75 hrs.)

Unit : 01

Flow of heat:- Concept of heat flow : Conduction through single wall, layers in series and cylinders. Natural and forced convection, temperature gradient in forced convection, concept of surface coefficient, dimensional analysis to compute surface coeffiecnt, boiling liquids, condensing vapours, temperature drop in parallel and counter -current heat exchangers, radiation, Stefan - boltzmann law. Construction, operation and application of heat exchangers, interchangers and finned tubes .

Unit : 02

Evaporation : Theory of evaporation, heat and material balance; evaporator types : Steam jacketted kettle , horizontal, vertical tube evaporator, forced circulation evaporators, falling film and climbing film evaporators and agitated film evaporation. Capacity of multiple effect evaporators.

Unit : 03

Drying : Theory of drying , drying curves shrinkage of materials, construction , operation and application of different dryers, atmospheric and vacuum compartment dryer, rotary dryer, agitator dryer, spray dryer, freeze dryer, fluidized bed dryer.

Unit : 04

Distillation : Theory of distillation of binary miscible, immiscible mixtures . Theory of rectification, azeotropic distillation, steam distillation, simple distillation, extractive and fractional distillation, and molecular distillation design of equipment for different distillation methods.

Unit : 05

Crystalization : Mier's Theory, its limitations ,crystal growth , nucleation, caking of crystals, material and energy balances in crystallization. Construction, operation and application of batch crystallizers, agitated tank crystallizers, Swenson -walker crystallizer, Krystal crystallizer and vaccum crystallizers .

Unit : 06

Filtration : Theory of filtration , filter media construction and operation of filter press, metafilter, disk filter, rotary filter. Centrifuges - Theory, equipment and applications.

Extraction : Theory of extraction, flow diagram of oil- seed extraction equipment, Podbielniak extractor, counter current extraction, leaching of solids and equipment .

III/IV B.PHARMACY (6th Semester)

602 PHARMACEUTICAL ENGINEERING – II

(*Practicals)* (75 hrs.)

Part - A Study of the following equipments

01. Ball mill
02. Fluid energy mill
03. Colloid mill
04. Planetary mixer
05. Plate and frame filter press
06. Rotatory drum filters
07. Film evaporators
08. Multi effect evaporator
09. Spray drier
10. Fluid bed dryer
11. Freeze drying
12. Swenson-walker crystallizer
13. Recirculation magma crystallizer
14. Podbiel niak extract

Part - B

01. Determination of humidity of air
02. Determination of humidity of air by dew-point method
03*. Size separation by sieving method
04*. Size reduction by ball mill
05. Determination of moisture content by IR moisture balance
06. Effect of filter aid concentration on rate of filtration
07. Factors affecting rate of filtration
08*. Determination of efficiency of steam distillation
09*. Determination of radiation constant of unpainted glass
10*. Determination of radiation constant in iron.
11*. Determination of radiation constant of painted glass
12. Size reduction by disintegration mill.
13. Determination of over all heat transfer coefficient.
14*. Determination of drying rate curve for calcium carbonate
15*. Determination of drying rate curve for sand
16. Crystallisation.

TEXT BOOKS :

01. Introduction to chemical Engineering by Badger
02. Text Book of Pharmaceutical Engineering by K.Samba Murthy
03. Perry's Chemical Engineers Hand Book.
04. Pharmaceutical Engineering by C.V.S.Subrahmanyam
05. Bentley's Text book of Pharmaceutics.

III/IV B.PHARMACY (6th Semester)

MODEL QUESTION PAPER

601 PHARMACEUTICAL ENGINEERING - II (Theory)

Time : 3 hours Max.Marks : 80

SECTION - A

Answer any four questions (4 X 10 = 40 marks)

1. Describe multipass heater along with its advantages over single pass heater.
2. Give the design and working of vertical tube and climbing film evaporator
3. Give the design and operation of a fluidised bed dryer
4. Discuss the azeotropic distillation and molecular distillation.
5. Discuss the design, principle and working of swensen-walker crystallizer and krystal onstallizer.
6. Describe the construction, working and applications of a filter for use as a continuous type.

SECTION - B

Answer any TEN questions (10 x 4 - 40 marks)

7. What are finned tubes ?
8. What is fourier's law and thermal conductivity ?
9. Write briefly on scale formation.
10. Write the theory of evaporation.
11. What is the principle involved in the freeze drying ?
12. Give the applications of spray dryer
13. What is mean free path ? Write its importance.
14. Give the types of fractionating column used in fractional distillation.
15. What is mier's supersaturation theory ? Write its limitations.
16. Write the factors influencing crystallization.
17. Write briefly on disc filters
18. Write the principle involved in filteration technique.

III/IV B.PHARMACY (6th Semester)

MODEL QUESTION PAPER (Practicals)

602 PHARMACEUTICAL ENGINEERING-II

Time : 6 hours Max.Marks : 80

1.	Synopsis	:	10 Marks
2*.	Major Experiment	:	35 Marks
3.	Minor Experiment	:	20 Marks
4.	Viva-Voce	:	15 Marks

		Total:	80 Marks

III/IV B.PHARMACY (6th Semester)

603 PHARMACEUTICAL BIOTECHNOLOGY

(Theory) (75 hrs.)

Unit : 01

Fermentation Products :

i. Screening methods for bioactive metabolites
ii. Introduction to fermenter and its accessories,
iii. Manufacture of the following : study of media , conditions, extraction and purification of
   a) Antibiotics- Pencillin and streptomycin
   b) Acids- Citric acid and lactic Acid
   c) Solvents - Alcohol
   d) Enzymes - Fungal diastase
   e) Vitamins- Vitamin B12
   f) Miscellaneous - Dextran and lactobacillus

Unit : 02

Test for sterility : Sterility testing , media , sampling, neutralisation of various antimicrobial substances in dosage forms. Surgical dressings, sutures and ligatures and their standards, sterilization and test for sterility.

Unit : 03

Animal products : Extraction and purification of insulin, pancreatin, pepsin, heparin and liver preparations. Blood products and plasma substitutes of I.P

Immunological Products : Manufacture of vaccines, sera, anti-toxins and diagnostic agents official in I.P

Unit : 04

Principles of Microbiological assay of vitamin-B_{12}, penicillin, streptomycin and tetracyclines. Radio Immunoassay - Principles , estimation of insulin in blood serum

Unit : 05

Microbial conversion of steroids, Enzyme immobilization : Methods of enzyme immobilization, factors affecting enzyme kinetics, study of streptokinase, penicillinase, amylase and immobilization of bacterial cells.

Unit : 06

An introduction to Recombinant DNA technology : Brief knowledge about the making of human Insulin, Interferons, monoclonal antibodies, synthetic vaccines and streptokinase.

III/IV B.PHARMACY (6th Semester)

604 PHARMACEUTICAL BIOTECHNOLOGY

(Practicals) (75 hrs.)

01. Nitrate reduction test
02. Hydrogen sulphide production test
03. Study of growth of stationary and rotary shake flask cultures
04. Efficiency of laminar air flow unit
05. Effect of salt concentration on the growth of micro Organisms
06. Effect of PH on growth of micro organisms
07. Indole production test
08. Citrate utilization test
09. Test for sterility of sterile water for injection.
10. Test for sterility of bentonite powder
11. Test for sterility of talcum powder
12. Microbiological assay of tifampicin
13*. Microbiological assay of streptomycin
14. Catalase production test
15*. Microbiological assay of benzyl pencillin
16. Effect of temperature on the growth of micro Organisms
17. Microbiological assay of oxytetracycline
18. Microbial testing of sterile and non sterile products
19. Microbiological assay of benzyl pencillin by cup-plate method

TEXT BOOKS :

01. Industrial microbiology by Casida.
02. Industrial microbiology by Miller
03. Industrial microbiology by Prescott and Dunn.
04. I.P./B.P.
05. Tutorial Pharmacy by Cooper and Gunn.
06. Bentley's Pharmaceutics
07. Principles of Fermentation technology by P.F.Stanbury

III/IV B.PHARMACY (6th Semester)

MODEL QUESTION PAPER

603 PHARMACEUTICAL BIOTECHNOLOGY

Time : 3 hours Max.Marks : 80

SECTION - A

Answer any four questions (4 X 10 = 40 marks)

1. Define fermentation ? Explain the design and operation of fermentor with a neat sketch ? Add a note on significance of impellars, spargers and Baffles.'
2. What is sterility testing ? Describe various steps involved in sterility testing. What is repeat testing ?
3. What are vaccines and seras ? Classify various types of vaccines ? Explain the preparation, standardisation, labelling and storage of BCG vaccine ?
4. Explain the principle and procedure for estimation of Insulin by Radio immuno Assay ?
5. Explain the term immobilization ? Describe the different methods of enzyme immobilization. What are its advantages and disadvantages ?
6. Define R-DNA technology ? Describe the production of synthetic vaccine Hepatitis-B by R-DNA technology.

SECTION - B

Answer any TEN questions (10 x 4 - 40 marks)

7. Write short notes on bioauto graphy ?
8. Discuss the production of dextran with a flow diagram ?
9. Give a brief account on surgical catgut ?
10. Give a brief note on sampling methods of sterility testing ?
11. Give a brief note on extraction and purification of Heparin ?
12. Give a short notes on Dried Human Plasma ?
13. Discuss briefly about vitamin-B_{12} Microbial assay ?
14. Write the principle involved in Microbiological assay ?
15. Write the study of enzyme immobilisation of streptokinase.
16. Write the short notes on microbial conversion of steriods.
17. Write the principle involved in production and screening of Monoclonal antibodies.
18. Explain in brief about the recombinant production of interferons.

III/IV B.PHARMACY (6th Semester)

MODEL QUESTION PAPER (Practicals)

604 PHARMACEUTICAL BIO-TECHNOLOGY

Time : 6 hours Max.Marks : 80

1.	Synopsis	:	10 Marks
2*.	Major Experiment	:	35 Marks
3.	Minor Experiment	:	20 Marks
4.	Viva-Voce	:	15 Marks
		Total:	80 Marks

III/IV B.PHARMACY (6th Semester)

605 HOSPITAL AND CLINICAL PHARMACY

(Theory) (75 hrs.)

Unit : 01

Hospital pharmacy-Organization, personnel, location space and equipment - The Pharmacy and Therapeutic committee, Hospital Formulary, Investigational use of drugs- Developing the budget, purchasing and inventory control.

Unit : 02

The pharmacy procedural manual, Drug distribution, Dispensing to out-patients, in-patients and ambulatory patients- Dispensing of ancillary and controlled substances, procurement and distributions of alcohol

Unit : 03

Manufacturing of bulk and sterile supplies, quality control in Hospital pharmacy. Drug charges in Hospitals, Drug information centre- Professional practices.

Unit : 04

Introduction and scope of clinical pharmacy practice - Modern dispensing aspects- patient counselling and advice- Medication history.

Unit : 05

Drug Interactions-Mechanisms–A systematic study of drug interactions with suitable examples. Drug-food interactions, adverse drug reactions- Drug induced diseases.

Unit : 06

Clinical Pharmacy aspects of

a)	Peptic ulcer,	b)	Angina Pectoris,
c)	Hypertension,	d)	Asthma,
e)	Tuberculosis,	f)	Diabetis,
g)	Acute renal failure,	h)	AIDS,
I)	Hepatitis	j)	Rheumatoid arthritis

III/IV B.PHARMACY (6th Semester)

606 HOSPITAL AND CLINICAL PHARMACY

(Practicals) (75 hrs.)

01. General dispensing procedures
02. Study of Weights and measures
03. Preparation and dispensing of prescriptions of following classes of products : Powders, Mixtures, Ointments, Large Volume Parenterals.
04. Draw the layout and workflow patterns in the dispensary of a hospital.
05. Examine and report the drug distribution methods used in a hospital.

TEXT BOOK :

01. Cooper and Gun-Dispensing for Pharmaceutical Student
02. Hospital Pharmacy by William.E.Hassan
03. Clinical Pharmacy by Tipnis Bajaj
04. Pharmacotherapeutics by Roger and Walker.

III/IV B.PHARMACY (6th Semester)

MODEL QUESTION PAPER

605 HOSPITAL AND CLINICAL PHARMACY

Time : 3 hours Max.Marks : 80

SECTION - A

Answer any four questions (4 X 10 = 40 marks)

1. What is hospital pharmacy ? Explain about organization in a modern hospital and mention its functions ?
2. Enumerate various Drug distribution methods for inpatients and out fatients ?
3. Explain about sterile supplies in the hospital ? Draw a neat sketch of parenterals layout in the hospital ?
4. Define clinical pharmacy ? Mention its functions ? Add a note on current status in India.
5. Define Drug interactions ? Classify different types of drug interactions ? Add a note on absorption mediated drug interactions
6. Elucidate the pathophysiology of diabetis ? Mention signs and symptoms and suggest a line of treatment ?

SECTION - B

Answer any TEN questions (10 x 4 - 40 marks)

1. Write about pharmacy and therapeutic committee and mention its functions ?
2. Write a short notes on Hospital formulary ?
3. Explain about Pharmacy procedure manual ?
4. Explain the dispensing procedure of ancillary and controlled substances
5. Write about drug information centre and its functions in Hospital
6. Explain about drug charges for inpatients & out patients in the hospital
7. Write short notes on pharmaco-economics
8. Write concept of essential drugs
9. Write short notes on drug indensed diseases
10. Explain about teratogeneity
11. Explain pathophysiology of Asthma
12. Explain pathophysiology of AIDS

III/IV B.PHARMACY (6th Semester)

MODEL QUESTION PAPER (Practicals)

605 HOSPITAL AND CLINICAL PHARMACY

Time : 6 hours Max.Marks : 80

1.	Synopsis	:	10 Marks
2*.	Major Experiment	:	35 Marks
3.	Minor Experiment	:	20 Marks
4.	Viva-Voce	:	15 Marks
		Total:	80 Marks