IV/IV B.PHARMACY (7th Semester)

701 PHARMACEUTICS-III (Theory) (75 hrs.)

(BIOPHARMACEUTICS, PHARMACOKINETICS & NEW DRUG DELIVERY SYSTEMS)

Unit : 01

Biopharmaceutics :

Introduction , Definitions, Fate of drug after administration , Blood level curves, Routes of drug administration, Drug absorption and disposition . Significance in product, formulation and development. Drug absorption –Structure of biological membrane, drug transport mechanisms, factors and kinetics involved – Physico- chemical and biological factors involved in drug absorption. Formulation and dosage form considerations in drug absorption .

Drug Dissolution : Mechanisms , factors and kinetics of dissolution dissolution rate significance and evaluation – Official methods

Unit : 02

Bioavailability : Concept and definitions, Factors involved on Assessment and significance of Drug Distribution. Plasma protein binding and its implications- Enterohepatic cycling.

Drug Elimination : Drug metabolism, path ways of drug metabolism Excretion- Excretion through urine, faeces, lungs and skin –Mechanism of renal excretion- renal clearance.

Unit : 03

Pharmacokinetics : Introduction – Compartment models –study of the methods of estimation, significance of the following parameters, biological half- life, apparent volume of distribution, renal clearance, total body Clearance, absorption rate, AUC - Mathematical expressions describing the variation in blood concentrations following I.V. and oral routes . Introduction to dosage regimen.

Unit : 04

Non-linear Pharmacokinetics : Non-linear Pharmacokinetics with special reference to one compartment model after IV drug administration, Michaeles-Menten equation. Detection of non linearity (Saturation Mechanism)

Unit : 05

Sustained release dosage forms : Principles and concepts involved, dosage calculations, methods adopted in release controlling, Design, manufacture and evaluation of various types of sustained release products. parenteral long acting products, implants.

Microencapsulation : Purpose and applications – Techniques of microencapsulation

Unit : 06

Novel Drug Delivery Systems : Introduction to Novel Drug Delivery systems – concept of controlled drug delivery, oral and Transdermal delivery systems - Liposomes, Concept on niosomes and resealed erythrocytes

702 PHARMACEUTICS-III (BIOPHARMACEUTICS, PHARMACOKINETICS & NEW DRUG DELIVERY SYSTEMS)

(Practicals) (75 hrs.)

01*. Dissolution rate testing and analysis of data
02*. Effect of surfactant on the solubility and dissolution rate of salicylic acid
03*. Effect of diluents on dissolution rate of salicylic acid
04*. Effect of concentration of magnesium stearate on dissolution rate of salicylic acid.
05. Evaluation of drug release from semi solid dosage form
06. Relation ship between pH, solubility, partition coefficient and percent ionization of salicylic acid .
07*. Enhancement of dissolution rate by solid dispersion technique
08*. Evaluation of diltiazem hydrochloride conventional and sustained release marketed tablets.
09*. Evaluation of nifedipine conventional tablet & capsule
10. Evaluation of disintegration and dissolution rate of commercial tablets
11. Basic pharmacokinetic calculations
12. Determination of bioavailability of four brands of given drug
13. Determination of absorption rate constant by Wagner-Nelson method
14. Determination of K_E & biological half life from plasma concentration and urinary excretion data
15. Determination of absorption rate constant by method of residuals
16. Preparation of microcapsules of naproxen
17. Calculation of pharmacokinetic parameter as per one compartment model
18. Estimation of renal clearance of creatinine and glomerular filtration rate
19. Determination of construction of standard graph for the estimation of sulphamethoxazole in blood.
20. Determination of biological half-life of rifampicin by urinary excretion data

TEXT BOOKS :

01. Pharmacokinetics by Gibaldi
02. Biopharmaceuticals and Pharmacokinetics by R.E.Notari.
03. Pharmacokinetics by Ritschal
04. Modern Pharmaceutics by G.S.Banker
05. Applied Biopharmaceutics and Pharmacokinetics, Leon Shargel
06. Clinical Pharmacokinetics; Concepts and applications by T.Rowland and Tozer
07. Bioavailability and bioequivalence by Ganesan & Pal.
08. Dissolution , bioavailability and bioequivalence by Hamed M.Abdou.

MODEL QUESTION PAPER

701 PHARMACEUTICS - III

(BIOPHARMACEUTICS, PHARMACOKINETICS AND NOVEL DRUG DELIVERY SYSTEMS) (Theory)

Time : 3 hours Max.Marks : 80

SECTION - A

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

1. Define Drug absorption ? Enumerate salient features of various drug transport mechanisms ? Explain about fick's first law of diffusion.
2. Define Bioavailability and Bioequivalence ? Explain about experimental protocol in determination of bioavailability ?
3. Elucidate any one method to calculate absorption rate constant for an extra vascular administration following one compartment model. Mention merits and demerits and derive expressions for C_{max} and t_{max}
4. Explain about Michaelis - Menten's equation ? How do you estimate K_m and V_{max} after i.v. bolus administration of drug following non-linear kinetics.
5. Explain the Principle and factors involved in design of sustained release formulations ? How will you calculate the loading and maintenance doses for SR products.
6. Define liposomes ? Enumerate various methods to produce liposomes ? Add a note on applications.

SECTION - B

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

7. Write about gastric emptying time ?
8. Explain pH partition theory and mention its limitation ?
9. Explain enterohepatic cycling ?
10. Explain mechanisms of Renal excretion ?
11. Explain significance and application of A.U.C., volume of distribution (Vd) and clearance.
12. Define dosage regimen ? Explain the significance of two parameters in designing dosage regimen ?
13. Define Non linearity and causes for non-linearity
14. Write about michael-Menten's equation ?
15. Explain about coaceration - phase separation mechanism
16. Write short notes on implants ?
17. Write short notes on niosomes ?
18. Write short notes on transdermal drug delivery system ?

MODEL QUESTION PAPER (Practicals)

702 PHARMACEUTICS-III

(BIOPHARMACEUTICS, PHARMACOKINETICS AND NOVEL DRUG DELIVERY SYSTEMS)

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

IV/IV B.PHARMACY (7th Semester)

703 PHARMACOLOGY-II (Theory) (75 hrs.)

Unit : 01

Pharmacology of drugs acting on cardiovascular system : Cardiac glycosides, antihypertensive drugs, coronary dilators, antihyper-lipidemic drugs, antiarrhythmic drugs. Drugs acting on the blood and blood forming agents, coagulants, anticoagulants, haematinics : Iron, Vitamin-B_{12} and folic acid.

Unit : 02

Pharmacology of drugs acting on Respiratory system : Bronchodilators, antitussives and expectorants.

Autocoids: Histamine–antihistaminics, serotonin, serotoninantagonists, prostaglandins.

Unit : 03

Chemotherapy : General principles – Sulphonamides, antibiotics, antiprotozoal drugs, antimalarials, antiamoebic, antifungal and antiviral drugs, chemotherapy of tuberculosis, leprosy and cancer.

Unit : 04

Pharmacology of drugs acting on endocrine system : Thyroid, anti-thyroid drugs, insulin and oral hypoglycemics, glucagon, adrenocortical steroids, pituitary hormones, sex hormones and oral contraceptives.

Unit : 05

Bioassays : General principles of bioassays, Estimation of errors in bioassays. Study of the official biological assay methods of adrenaline, posterior pituitary hormones, insulin, gonadotrophic hormones, test for pyrogens.

Unit : 06

Principles of Toxicology : Poisons, general treatment of poison, systemic antidotes, treatment of insecticide poisoning, heavy metal poisoning, narcotic drug, barbiturate and organophosphorous poisoning. Drug dependence, drug abuse, addictive drugs and their treatment.

IV/IV B.PHARMACY (7th Semester)

704 PHARMACOLOGY-II (Practicals) (75 hrs.)

01. Introduction to basic equipment used in experimental pharmacology
02. Study of mydriatic & miotic effects on rabbit eye
03. Evaluation of local anaesthetic activity by surface anaesthesia method
04. Concentration response curve of acetylcholine
05. Bioassay of acetylcholine by interpolation method

06*. Effect of neostigmine on dose response curve of acetylcholine
07*. Effect of pancuronium on dose response curve of acetylcholine
08*. Three point bioassay method.
09*. Effect of adrenaline and acetylcholine on isolated frog's heart
10*. Effect of calcium chloride and potassium chloride on isolated frog's heart
11*. Effect of adrenaline in presence of a β-blocker on isolated frog's heart
12*. Effect of acetylcholine in presence of atropine on isolated frog's heart

TEXT BOOKS :

01. Goodman and Gilman- "The Pharmacological Basis of Therapeutics"
02. Textbook of Phramacology by Rang and Dale.
03. Quientessence of Medical Pharmacology by C.Chowdary.
04. Lippincott's illustrated reviews : Pharmacology by Richard, D.Howland and MeryJ.Mylek.
05. Basic and clinical pharmacology by Bertran G.Katzung.
06. Review of medical pharmacology by F.H.Meyers, E.Jawetz and A.Goldfien.
07. Essentials of Medical Pharmacology by K.D.Tripathi.
08. Essential of Pharmacotherepeutics by F.S.K.Barar.

IV/IV B.PHARMACY (7th Semester)

MODEL QUESTION PAPER

703 PHARMACOLOGY - II (Theory)

Time : 3 hours Max.Marks : 80

SECTION - A

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

1. Classify antihypertensives with examples and describe the mechanism of action and clinical uses of any three different groups of antihypertensives.
2. Explain the pathogenesis of asthma. Classify antiasthmatic drugs and discuss the pharmacology of β-selective drugs.
3. Discuss in detail about various mechanisms of actions of different antibiotics with suitable examples.
4. What is diabetes ? Classify antidiabetic drugs and discuss the pharmacology of Insulin.
5. Define bioassay. What are its advantages and disadvantages ? How is posterior pituitary extract standardised for "oxytocic" activity.
6. Outline the principles of treatment of acute poisoning in general. Discuss about the management of organophosphorous poisoning.

SECTION - B

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

7. Describe the mechanism of action, therapeutic uses and unwanted effects of digitalis.
8. Write notes on HMG-CoA reductase inhibitors.
9. Write short notes on expectorants.
10. Write short notes on pharmacology of prostaglandins.
11. Write about antimetabolites.
12. Write briefly on bacterial resistance.
13. Write about corticosteroids.
14. Write short notes on antithyroid drugs.
15. Write short notes on errors in bioassays.
16. Write short notes on test for pyrogens.
17. Give an account on drug addiction.
18. Write short notes on heavy metal poisoning and its treatment.

IV/IV B.PHARMACY (7th Semester)

MODEL QUESTION PAPER (Practicals)

704 PHARMACOLOGY-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

IV. B.PHARMACY (7th Semester)

705 PHARMACEUTICAL ANALYSIS –II

(Theory) (75 hrs.)

General treatment of the theory, instrumentation and applications of the following analytical methods.

Unit : 01

Spectrophotometry (UV, Visible, IR), Nephalometry and Turbidimetry, Fluorimetry and Flame Photometry

Unit : 02

Potentiometry and pH metry, conductometry and high frequency titrations, polarography and amperometry.

Unit : 03

Chromatography-introduction, paper chromatography , Thin layer chromatography, Column chromatography, Gas Chromatography and Ion-exchange chromatography.

Unit : 04

High performance liquid chromatography, High performance thin layer chromatography, Electrophoresis and counter current distribution.

Unit : 05

Differential thermal Analysis, Basic Principles of Radio immuno assay and its applications in Pharmaceutical Analysis. Basic theory, instrumentation and applications of Nuclear magnetic resonance spectroscopy.

Unit : 06

Basic Theory, instrumentation and applications of mass spectroscopy, Electron spin resonance spectroscopy and X-ray diffraction.

IV/IV. B.PHARMACY (7th Semester)

706 PHARMACEUTICAL ANALYSIS – II (Practicals) (75 hrs.)

I. Visible Spectrophotometry

01. Determination of absorption maximum for potassium permanganate
02. Estimation of dapsone in tablets by colorimetry
03*. Estimation of sulfamethoxazole in oral suspension by colorimetry
04. Estimation of riboflavine in tablets by colorimetry
05. Estimation of terbutaline in Tablets by colorimetry
06*. Estimation of salbutamol sulphate in tablets by colorimetry
07. Estimation of isoxsuprine HCl in tablets.
08*. Estimation of salbutamol sulphate with Diazo Dapsone reagent
09*. Estimation of terbutaline sulphate with Diazo Dapsone reagent
10. Estimation of isoxsuprine HCl in tablets by colorimetry
11. Estimation of analgine in tablets by colorimetry
12. Estimation of ampicillin in capsules by colorimetry
13. Estimation of metoclopramide HCl in injections by colorimetry.

II. U.V.Spectrophotometry

14. Estimation of paracetamol in tablets by U.V.method.
15. Estimation of ciproflaxacin HCl in tablets by U.V.method

III. Nephelometry

16*. Estimation of sulphates by nephelometry

IV. Potentiometry

17*. Titration of strong acid with a strong base
18. Determination of dissociation constant of weak acid

V. Complexometry

19. Determination of hardness of tap water

VI. Chromatography

20. Identification of aminoacids by paper chromatography
21. Identification of aminoacids by TLC

VII. Karl Fisher Titration

22*. Determination of moisture content by KFR

TEXT BOOKS :

01. Quantitative Pharmaceutical Chemistry by Jenkins
02. A Text Book of Pharmaceutical Analysis by K.A.Connors.
03. Instrumental Methods of Analysis by H.H.Willard.
04. Modern methods of Pharmaceutical Analysis by R.E.Schirmer
05. Instrumental methods of chemical analysis by B.K.Sharma
06. Instrumental methods of chemical analysis by G.R.Chatwal.
07. Practical Pharmaceutical Chemistry by Becket and Stenlake
08. Organic spectroscopy by William Kemp
09. Pharmaceutical Drug Analysis by Ashuthosh Kar.

IV/IV. B.PHARMACY (7th Semester)

MODEL QUESTION PAPER

PHARMACEUTICAL ANALYSIS - II (Theory)

Time : 3 hours Max.Marks : 80

SECTION - A

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

1. Explain Beer-Lambert's law and discuss about the deviations from Beer's law
2. Explain the principles of polarography ? Write the construction and working of a instrument used in polarography.
3. Explain detectors used in gas chromatography with a neat diagram.
4. Write the instrumentation of HPLC with a neat diagram.
5. What is differential thermal analysis ? Discuss the factors affecting DTA curve.
6. Explain the instrumentation of mass spectrometer with a neat diagram.

SECTION - B

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

7. Mention the different types of electronic transitions observed in organic molecules.
8. Write the principle involved in fluorimetry
9. Give the principle involved in potentiometry
10. Mention the applications of conductometry
11. Write the adsorbants and spray reagents used in TLC.
12. Write the methodology for paper chromatography.
13. Write advantages of HPTLC over TLC
14. Mention briefly process involved in electrophoresis.
15. List out the applications of radioimmuno assay in pharmaceutical analysis
16. Write the theory involved in nuclear magnetic resonance spectroscopy
17. What is the principle involved in ESR
18. Write the theory involved in XRD analysis

IV/IV. B.PHARMACY (VIIth Semester)

MODEL QUESTION PAPER (Practicals)

706 PHARMACEUTICAL ANALYSIS-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

IV/IV. B.PHARMACY (7th Semester)

707 INDUSTRIAL MANAGEMENT AND PHARMACEUTICAL MARKETING (50 hrs.)

Unit : 01

Elements of Organization and Management : Functions of management

Unit : 02

Plant location and lay-out of an industry : various factors affecting locational aspect, layout of building and equipment product lay-out v/s process layout, drug store location and selection of premises, drug store management.

Unit : 03

Production planning and Control : Scientific purchasing, quality control, problems of productivity, stores organization, location of stores, receiving, inspection of materials, issue from the store, control of stores and stocks, Store Accounting and Records.

Personnel management : Selection, Appointment, training, transfer, Promotion, demotion policies, remuneration, job evaluation , human relations.

Unit : 04

Sales organisation : Market, definition–Determent approaches to the study of marketing, institutional approach, Market planning – Product planning, method of marketing, wholesale retailers, functional approach, cost and efficiency in marketing commodity approach.

Distribution polices : pharmaceutical product marketing, sales promotion policies-Detailing to physician, professional persons, sampling, window and interior display, product advertising , sales promotion, publicity.

Unit : 05

Elementary Industrial Accountancy : Elements of Double entry book Keeping, Books of Accounts-Journal and ledger, cash book. Balance sheet, Profit and Loss Account, Principles of Costing and Estimating.

Unit : 06

Regulatory affairs :

(a) Schedule M of Drugs and Cosmetics act
(b) Drug Development Stages - NDA and NADA filing
(c) ICH guidelines - Introduction.

TEXT BOOKS :

01. Production Management by K.Aswathappa.
02. Marketing Management by Sherlekar.
03. Drug Store Management by Mahesh
04. Pharmaceutical Production and Management by C.V.S.Subrahmanyam
05. Advanced accounts by M.C.Shukla

IV/IV. B.PHARMACY (7th Semester)

MODEL QUESTION PAPER **(Theory)**

INDUSTRIAL MANAGEMENT

Time : 3 hours Max.Marks : 80

SECTION-A

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

1. Explain the elements of organization.
2. What are the factors that affect the plant layout ?
3. Discuss various methods of selection. Explain the job evaluation methods suitable for pharmaceutical industry.
4. Explain about sales promotion policies
5. Write the importance and method of preparation of Balance sheet.
6. Discuss about ICH guidelines in detail.

SECTION - B

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

1. Explain about any two functions of management
2. Write about personal management
3. Draw layout for parenterals manufacturing.
4. Write a note on drug store management.
5. How materials are issued from the store ?
6. How the records are maintained in the store ?
7. Write a short notes on method of marketing .
8. Write the differences between wholesale marketing and retail marketing
9. Write a note on journal
10. What is cash book and what are the diffrerent forms of it ?
11. Write a short notes on schedule “M”
12. How the NDA filling was carried for a drug ?

IV/IV. B.PHARMACY (8th Semester)

801 PHARMACEUTICALCHEMISTRY –V

(NATURAL PRODUCTS)- (Theory) (75 hrs.)

Unit : 01

Carbohydrates : General aspects of mono, di and polysaccharides. Chemistry of glucose, fructose, sucrose and lactose.

Glycosides : Preparation and properties of methyl glycosides. A knowledge of the sources, chemistry and uses of cardiac glycosides and Anthra quinone glycosides, structural elucidation of amygdalin and salicin

Unit : 02

Proteins : An elementary knowledge of the classification and general characteristics of proteins, amino acids and their relationship to proteins. Chemistry of oxytocin, Chemistry and biological significance of purines, uric acid , xanthine bases and nucleic acids.

Unit : 03

Fats and Oils : The extraction, general composition, properties and analysis of fixed oils, fats and waxes.

Terpenes : Occurrence, general methods of isolation and classification of terpenes, Structural features and inter relationship of geraniol, citral, limonene, α-terpineol and menthol. General composition, properties, analysis of essential oils official in I.P. Chemistry and biological significance of flavonoids

Unit : 04

Alkaloids : Classification, general methods of extraction and determination of chemical structure. Quantitative determination of functional groups. Determination of the structures of ephedrine, nicotine and papaverine.

Unit : 05

Steroids and Hormones: Nomenclature, chemistry of ergosterol, cholesterol, bile acids and cortisone, preparation and structures of sex hormones, interrelationship of estradiol, estrone and estroil . Synthesis of progesterone, irradiation of ergosterol and preparation and properties of thyroid hormones.

Unit : 06

Vitamins : Classification, determination of structures of thiamine, riboflavin and ascorbic acid , skeleton structures of vitamins official in I.P. A study of their properties, stability and uses

IV/IV. B.PHARMACY (8th Semester)

802 PHARMACEUTICAL CHEMISTRY – V

(NATURAL PRODUCTS) (Practicals) (75 hrs.)

01*. Determination of acid value of fixed oil
02*. Determination of saponification value of a fixed oil
03. Determination of ester value of oil
04*. Determination of iodine value of oil

Volatile Oils

01*. Determination of cinnamic aldehyde in cinnamon oil
02. Determination of eugenol in clove oil
03. Qualitative analysis of natural products (Comprises of amino acids, carbohydrates, proteins, alkaloids, glycosides, steriods, flavonoids)
04. Isolation of casein from the milk
05. Isolation of piperine from black pepper powder
06*. Estimation of ephedrine hydrochloride by non aqueous titrimetry
07*. Estimation of quinine sulphate
08*. Extraction of caffeine from tea dust.

TEXT BOOKS :

01. Organic Chemistry - Vol. II by I.L.Finar
02. Organic, Pharmaceutical and Medicinal Chemistry by Wilsonand Gisvold.
03. Remington's Text Book of Pharm. Sciences.
04. Text book of Medicinal Chemistry by A.Burger
05. Rama Rao Nadendla, Pharmaceutical Organic Chemistry, (Chemistry of Heterocyclic and Natural Compounds), Vallabh Publications, New Delhi
06. Organic chemistry of natural products by Gurdeep chatwal, volume I & II.
07. Organic chemistry of natural products by O.P.Agharwal volume I & II.

IV/IV. B.PHARMACY (8th Semester)

MODEL QUESTION PAPER

PHARMACEUTICAL CHEMISTRY-VI (NATURAL PRODUCTS)

Time : 3 hours Max.Marks : 80

SECTION-A

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

1. What are alkaloids ? How are they isolated and identified ? Discuss the structural elucidation of nicotine.
2. Classify vitamins with examples and discuss the sturctural elucidation of Riboflavin.
3. Discuss the important reactions and structural features of glucose.
4. Discuss the chemical relationship between oestrone, oestradiol and oestriol and describe the synthesis of oestrone.
5. Classify terpenes with examples, State isoprene and special isoprene rules. How do you elucidate the structue of citral ?
6. Classify aminoacids with examples ? Write the relationship between aminoacids, polypeptide and proteins ? Explain how do you convert xanthine into caffene

SECTION - B

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

1. What is mutarotation and write its significance ?
2. Write a brief account on chemistry of cardiac glycosides ?
3. How do you determine methoxyl groups in papaverine ?
4. What is Isoelectric point and write its significance.
5. Write short notes on nucleic acids
6. Give a brief account on chemistry of flavanoids
7. How do you confirm the presence of pyrimidine in thiamine.
8. How Hoffmann exhaustive methylation is used to determine the structure of alkaloids.
9. What are vitamins. Write the sturcture of any three vitamins
10. Give a synthetic scheme for conversion of diosgenin to progesterone
11. Write short note on biological role of thyroid hormones.
12. How do you conform the presence of keto.enol sysemin vitamin C ?

IV/IV. B.PHARMACY (8th Semester)

MODEL QUESTION PAPER (Practicals)

802 PHARMACEUTICAL CHEMISTRY-V (Natural Products)

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

IV/IV. B.PHARMACY (8th Semester)

803 PHARMACOGNOSY- II (Theory) (75 hrs.)

Systematic pharmacognostic studies of following categories of crude drugs

Unit : 01

Glycosides : Aloes, Ammi, Brahmi, Buckwheat, Cantharides, Cascara, Chirata, Digitalis, Dioscorea, Gentian, Ginseg, Kalmegh, Liquorice, Psoralea, Quassia, Senna, Rhubarb, Squill, Strophantus, Wild Cherry bark.

Unit : 02

Alkaloids : Aconite, Belladona, Cinchona, Colchicum, Datura, Duboisia, Ephedra, Ergot, Hyoscyamus, Ipecac, Kurchi, Lobelia, Nux-vomica, Opium, Rauwolfia, Solanum khasianum, Vasaka, Vinca, Withania.

Unit : 03

Volatile oils : Bitter orange peel, Caraway, Cardamom, Cassia, Cinnamon, Citronella, Civet, Clove, Corriander, Dill, Eucalyptus, Fennel, Gaultheria, Lemonpeel, Musk, Nutmeg, Palmarosa, Peppermint, Saffron, Sandal wood, Tulsi, Vetiver.

Unit : 04

Historical development of plant tissue culture; types of cultures -a study of callus culture and cell suspension. Culture, nutritional requirements, growth and their maintenance. Applications of plant tissue culture in production of pharmaceutically important secondary metabolites.

Unit : 05

A study of the following Ayurvedic drugs, (Botanical source, chemical constituents, pharmacological actions and uses)

01. Amla (Phyllanthus emblica)
02. Bheda (Terminalia belerica)
03. Kantkari (Solanum xanthocarpum)
04. Malkangni (Celactrus panicula)
05. Tylophera(Tylophora indica)
06. Sataver(Asparagus recomosus)
07. Bhilawa(Semecarpus anacardium)
08. Kalijiri(Vernonia anthelmintica)
09. Kaner(Nerium indicum)
10. Punarnava (Bocrhaevic diffuca)
11. Sankhapushpi

Unit : 06

Lipids : Bees wax, Castor oil, Cocoa butter, Cod-liver oil, Hydnocarpus oil, Kokum butter, Lard, Linseed oil, Rice bran oil, Skark liver oil and wool fat.

IV/IV. B.PHARMACY (8th Semester)

804 PHARMACOGNOSY - II (Practicals) (75 hrs.)

I*. Study of Morphology and transverse section of the crude drugs.

a.	Fennel	b.	Clove	c.	Coriander
d.	Nuxvomica	e.	Cinnamon	f.	Cinchona
g.	Dill	h.	Ephedra	i.	Ipecac
j.	Senna	k.	Vasaka	l.	Vinca

II. Identification of powdered crude drugs based on their microscopical characters.

a.	Senna	b.	Vasaka	c.	Ginger
d.	Cinchona	e.	Cinnamon	f.	Squill
g.	Rauwolfia	h.	Kurchi	i.	Naxvomica
j.	Quassia				

III*. Identification powdered crude drugs (Listed in II) in their mixtures based on microscopical characters.

IV. Aseptic seed germination (Trigonella seeds)

V. Callus initiation and establishment (Catharantus roses leaves)

VI. Morphology of crude drugs

01.	Fennel	02.	Clove	03.	Coriander
04.	Cardamom	05.	Nuxvomica	06.	Cinnamon
07.	Cinchona	08.	Dill	09.	Quassia
10.	Ephedra	11.	Senna	12.	Vinca
13.	Datura	14.	Tulsi	15.	Nutmeg
16.	Peppermint oil	17.	Lemon peel	18.	Aconite
19.	Ashwagandha	20.	Kurchi	21.	Rauwolfia
22.	Dioscorea	23.	Arjuna	24.	Chirata
25.	Squill	26.	Gentian	27.	Ginger
28.	Turmeric	29.	Glycerrhiza	30.	Amla
31.	Ipecac	32.	Bitter Orange Peel		

TEXT BOOKS :

01. Tyler, V.C.,Brady, L.R. and Robbers, J.E. "Pharmacognosy" 8th Ed., Lea and Febiger, Philadelphia.
02. Text Book of Pharmacognosy by T.E.Wallis.
03. Trease, G.E. and Evas, W.C., "Pharmacognosy" 11th and 12th editions, Bailliere Tindall, U.K.
04. Kokate, C.K., Purohit A.P. and Gokhale, S.B., "Pharmacog nosy" Nirali Prakashan, 1990.
05. Ross, M.S.F. and Brain, K.R., "an Introduction to Phytopharmacy Pitman Medical-Kent.
06. Indian Material Medica by A.K.Nadkarni
07. Essentials of Pharmacognosy by Dr.S.H.Ansari.
08. Pharmacognosy and Phytochemistry by Ashutoshkar.

IV/IV. B.PHARMACY (8th Semester)

MODEL QUESTION PAPER

PHARMACOGNOSY-II (Theory)

Time : 3 hours Max.Marks : 80

SECTION - A

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

1. Write the method of preparation, chemical constitutents and uses of Aloes
2. Describe Ergot life cycle, chemistry and uses of the ergot alkaloids.
3. Write the systematic pharmacognostic study of Cinnamon
4. Write the establishment, measurement of growth and production of secondary metabolites in callus and cell suspension.
5. Give the biological source, chemical constituents and uses of amla and sataver.
6. Write the systematic pharmacognostic study of Castor oil

SECTION - B

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

7. Write the biological source and uses of liquorice and Cantharides.
8. Describe the chemistry of cardiac glycosides.
9. Write the chemical constituents and uses of any two crude drugs containing indole alkaloids.
10. Write the biological source and chemical test for ipecae and Colchium
11. Give the comparitive microscopy of Fennel and Coriander.
12. Write the biological source and active constituents of Ciret and Musk.
13. Enumerate nutritional requirements of plant tissue cultures.
14. Give an account on surface sterilition of an explant in plant tissue cultures.
15. Write the biological source and uses of Bhilawa and Kantakari
16. Write the chemical constituents and uses of Tylophera and Punarnava
17. Describe the physico chemical properties and identification tersfor lipids
18. Write the method of preparation and uses of woolfar.

IV. B.PHARMACY (8th Semester)

MODEL QUESTION PAPER (Practicals)

804 PHARMACOGNOSY-II

Time : 6 hours Max.Marks : 80

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

		Tota :	80 Marks

IV/IV. B.PHARMACY (8th Semester)

805 GOOD MANUFACTURING PRACTICES AND VALIDATION

(Theory) (50 hrs)

Unit : 01

Concepts and Philosophy of Good Manufacturing Practice (GMP). Brief introduction of CGMP.

Unit : 02

Concepts and Philosophy of Validation. Validation methods of equipment

Unit : 03

Validation methods of water supply systems, deionised and distilled water and water for injection.

Unit : 04

Calibration of Analytical Instruments (A brief introduction). Calibration of Spectrophotometer and HPLC instrument as per ICH guidelines.

Unit : 05

Sampling Techniques, Computer applications in GMP and GLP, Statistical quality control and control charts.

Unit : 06

Concepts and Philosophy of GLP, SOP, ICH and ISO-9000.

TEXT BOOKS :

1. Good Manufacturing practice (GMP) - Mehra
2. How to practice GMP - PP Sharma
3. Quality Assurance of Pharmaceuticals (Vol-1 and 2, Pharma Book syndicate, Hyderabad)
4. A Guide to total quality management - K Maitra and S K Ghosh
5. Quality Assurance and Quality Management in pharmaceutical Industry-Y Anjaneyulu and R.Marayya.
6. ISO 9000 and Total Quality Management - S K Ghosh.
7. Quantitative Analysis of Drugs in Pharmaceutical Formulations-P.D.Sethi.

IV/IV. B.PHARMACY (8th Semester)

MODEL QUESTION PAPER

805 GOOD MANUFACTURING PRACTICES AND VALIDATION

Time : 3 hours Max.Marks : 80

SECTION-A

Answer any four Questions (4 x 10=40)

1. What is Good Manufacturing Practice (GMP) ? Explain in detail. Add a note on CGMP.
2. Explain the concept of Validation in Pharmacy.
3. Write a note on Validation methods of water supply systems.
4. What is meant by Calibration of analytical instruments ? Give the detailed procedure for the calibration of Spectrophotometer.
5. Write a note on sampling techniques. Explain in detail about correlation and regression and Analysis of Variance (ANOVA).
6. Write a note on any two of the following :
   (A) GLP (B) SOP (C) ICH

SECTION - B

Answer any TEN of the following . (10 x 4 = 20 marks)

7. Give the importance of GMP in Pharmaceutical Industry.
8. Write a brief note on CGMP.
9. What is Validation ?
10. Explain in brief about validation of pharmaceutical equipment.
11. How do validate deionised and distilled water systems.
12. What is water for injection ? Write briefly about validation of water for injection system.
13. What is Calibration of analytical instruments ? Explain in brief.
14. Write about the Calibration HPLC instrument as per ICH guidelines.
15. Explain precision and accuracy in detail. Give the importance of the above in Pharmaceutical Analysis.
16. Write a note on (a) t-test and (b) F-test
17. Explain in detail about ISO-9000
18. What do you mean by Standard operating procedure (SOP) ? Explain in brief.