Unit : 01
Biopharmaceutics

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

Unit : 02


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. Michaelis-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
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. Relationship 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
20. Determination of biological half-life of rifampicin by urinary excretion data

TEXT BOOKS:

01. Pharmacokinetics by Gibaldi
02. Biopharmaceutics 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 \( C_{\text{max}} \) and \( t_{\text{max}} \)
4. Explain about Michaelis - Menten's equation ? How do you estimate \( K_m \)
and \( V_{\text{max}} \) 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 coacervation - 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

:: 76 ::
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-B₁₂ and folic acid.

Unit : 02
Pharmacology of drugs acting on Respiratory system: Bronchodilators, antitussives and expectorants.

Autocoids: Histamine–antihistaminics, serotonin, serotonin antagonists, 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

Unit : 06
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 Pharmacology by Rang and Dale.
03. Quintessence of Medical Pharmacology by C.Chowdary.
05. Basic and clinical pharmacology by Bertran G.Katzung.
08. Essential of Pharmacotherapeutics 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 \( \beta \)-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

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# 79 #
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 riboflavin 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

II. U.V. Spectrophotometry
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
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
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 an 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
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)

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-Deterrent 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

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.
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 different 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 Anthraquinone glycosides, structural elucidation of amygdalin and salicin.

Unit : 02

Unit : 03
Fats and Oils : The extraction, general composition, properties and analysis of fixed oils, fats and waxes.

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

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 Wilson and Gisvold.
03. Remington’s Text Book of Pharm. Sciences.
04. Text book of Medicinal Chemistry by A.Burger
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.
A.N.U. B.PHARMACY SYLLABUS (WITH EFFECT FROM 2008-09 ACADEMIC YEAR)

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 structure 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 confirm 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

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Total: 80 Marks
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A.N.U. B.PHARMACY SYLLABUS (WITH EFFECT FROM 2008 - 09 ACADEMIC YEAR)

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

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 (Bocrahevic diffuca)
11. Sankhpushpi

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. Nuxvomica
   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 (Catharanthus 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
   31. Ipecac 32. Bitter Orange Peel

TEXT BOOKS:
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.
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 constituents 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 comparative 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 sterilization 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 tests for 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)
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.
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.