

IIIV B.PHARMACY (3rd SEMESTER)

301 PHARMACEUTICAL CHEMISTRY –II (ORGANIC-II)

(Theory) (75 hrs.)

Unit : 01 Stereochemistry :

- a. Stereo isomerism, tetrahedral optical activity, enantiomerism, diastereoisomerism, meso structures, elements of symmetry, chirality, chiral centers, absolute configuration, specification of D and L configuration. Nature of E and Z forms. Racemic modification and resolution of racemic mixture, conformational isomers, asymmetric synthesis.
- b. **Geometrical isomerism** : Principles, nomenclature of isomers, determination of configuration.
- c. Stereochemistry of alicyclic compounds, biphenyls and oximes.

Unit : 02 Chemistry of Aromatic compounds :

- a. Aromaticity, structure of benzene, stability of benzene, general methods to prepare aryl halides.
- b. Mechanism of electrophilic aromatic substitution (nitration, sulphonation, Halogenation, Friedel Craft's alkylation, acylation), Electrophilic aromatic substitution reactions of substituted benzenes, including reactivity, orientation and influence of activating and deactivating groups, mechanisms of nucleophilic aromatic substitution and mechanisms of electrophilic and nucleophilic addition reactions of α , β -unsaturated carbonyl compounds.
- c. General methods of preparation and chemical reactions of amines, phenols and diazonium salts.

Unit : 03 Chemistry of polynuclear aromatic hydrocarbons :

Synthesis (Haworth's), properties and chemical reactions of naphthalene, phenanthrene and anthracene. Structure and medicinal uses of propranolol, Tolnaftate, menadione, naphazoline, phenindione, morphine and codeine.

Unit : 04 Chemistry of heterocyclic compounds :

- a. General classification and nomenclature of heterocyclic compounds
- b. Synthesis, properties and reactions of furan, pyrrole, thiophene, pyridine, quinoline and isoquinoline.
- c. Structures of acridine, benzopyran, pyrazole, imidazole, benzimidazole, oxazole, isoxazole, thiazole, pyrimidine, pyridazine and phenothiazine.
- d. Structure and medicinal uses of phenazocine, nicotinic acid, nikethamide, isoniazid, mepyramine, benzhexol, chloroquine, histamine, carbimazole, pyrimethamine, piperazine, diazepam, diethylcarbamazine citrate, sulphadiazine, metronidazole.

Unit : 05 Name reactions:

Beckmann, Fries, Schimdt rearrangements; Clemmensen reduction, Oppenauer oxidation, Mannich reaction and Phillips reaction.

Unit : 06 Reagents used in organic synthesis:

Preparation and applications of N- Bromo succinimide, Lead tetra acetate and Lithium Aluminium hydride.

IIIIV B.PHARMACY (3rd SEMESTER)
302 PHARMACEUTICAL CHEMISTRY-II
(Practicals) (75 hrs.)

- 01*. Qualitative analysis of organic binary mixtures containing water insoluble organic compounds (05 organic binary mixtures should be analyzed)
- 02) Preparation of methyl orange
- 03) Preparation of methanamine (Urotropine)
- 04*) Preparation of para nitro aniline
- 05*) Preparation of para bromo aniline from acetanilide.
- 06) Preparation of fluoroscine

TEXT BOOKS :

01. R.T.Morrison and R.N.Boyd, "Organic Chemistry", Allyn and Bacon, Inc., Boston.
02. I.L.Finar, "Organic Chemistry", Vol. 1, The English Language Book Society, London.
03. B.S.Furniss, A.J.Hannaford, V.Rogers, P.W.G.Smith and A.H.Tatchell, Vogel's Text Book of Practical Organic Chemistry The English Language Book Society.
04. F.G.Mann and B.C.Saunders, Practical Organic Chemistry, Longmans, Green & Co., Ltd., London.
05. R.M.Acheson, An introduction to the Chemistry of Heterocyclic Compounds, Interscience Publishers, New York.
07. Rama Rao Nadendla, Pharmaceutical Organic Chemistry, (Chemistry of Heterocyclic and Natural Compounds), Vallabh Publications, New Delhi

IIIV B.PHARMACY (3rd SEMESTER)

MODEL QUESTION PAPER

301 PHARMACEUTICAL CHEMISTRY-II (ORGANIC-II) (Theory)

Time : 3 hours

Max.Marks : 80

SECTION-A

Answer any four questions

(4 X 10 = 40 marks)

1. What do you mean by R and S configuration? Explain this with suitable examples and discuss the sequence rules that help in the determination of configuration.
2. What is aromaticity? Why benzene is called as an aromatic compound?
3. What are polynuclear aromatic compounds? Discuss the method of preparation and reactions of naphthalene?
4. Write the synthesis and important reactions of pyrrole and quinoline.
5. Discuss the importance of Beckmann rearrangement in organic synthesis?
6. Discuss the use of Lithium aluminium hydride in organic synthesis?

SECTION - B

Answer any TEN questions

(10 X 4 = 40 marks)

7. Justify the statement "E & Z notation is more useful for polyolefinic compounds?"
8. Define the terms chirality and racemisation by giving suitable examples.
9. "Aromatic compounds undergo electrophilic substitutions". Justify the above statement.
10. Describe any three methods for the preparation of phenol.
11. Why naphthalene is more resistant to oxidation when compared to anthracene and phenanthrene?
12. Give the structure and medicinal uses of morphine, propranolol and naphazoline.
13. Give the structure and numbering of acridine, benzopyran, imidazole and 1,2-diazine.
14. Give the structure, chemical name and medicinal uses of metronidazole, histamine.
15. Discuss the mechanism of Fries rearrangement.
16. Write short notes on Mannich reaction.
17. Write short notes on applications of lead tetra acetate.
18. Give the importance of N-Bromo succinamide in organic synthesis.

IIIV B.PHARMACY (3rd SEMESTER)

MODEL QUESTION PAPER (Practicals)

302 PHARMACEUTICAL CHEMISTRY-III

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

IIIV B.PHARMACY (3rd SEMESTER)

303 PHARMACEUTICAL ENGINEERING-I (Theory) (75 hrs.)

Unit : 01

Introduction : Fundamental concept of material and energy balances, Units and Dimensions : Simple inter-conversions of units used in engineering calculations, dimensional analysis, Definitions of Stoichiometry, Unit operation, unit process and chemical technology, laboratory scale, pilot scale and industrial scale operations.

Unit : 02

Flow of fluids : Concepts of fluid statics and dynamics, construction of simple, differential and inclined manometers. Reynolds's number, Bernoulli's theorem and definition of head, friction losses, enlargement losses contraction losses, study of orifice meter, venturimeter, pilot tube and rotameter, simple problems on Bernoulli's theorem, friction losses and flow meters.

Transportation solids : Construction details advantages and disadvantages of belt conveyors, screw conveyors and pneumatic conveyors, bucket elevators.

Transportation of Fluids : Pipe standards, Joints fittings, cocks, globe valve, check valves, regulating valve, pumps, piston pump, plunger/pump, diaphragm pump, rotary pump, single stage suction centrifuge pump, self priming pump. Performance of reciprocating and centrifugal pumps

Unit : 03

Materials of pharmaceutical plant construction : Importance of materials in construction, the merits and demerits of different commonly used materials in plant construction such as iron, steel, copper, tin, aluminum, glass, rubber and plastic. Concept of corrosion, scale formation factors in forming corrosion, methods of reducing corrosion. Mechanical, Chemical, Electrical, Fire and Dust hazards. Industrial dermatitis, Accident Records.

Unit : 04

Humidity and air-conditioning : Definitions of humidity, relative humidity, percentage humidity, humid heat, humid volume, dew point, humidity chart, wet bulb theory, factors influencing the wet temperature, adiabatic saturation temperature. Theory of air - conditioning and description of equipment. Refrigeration principle and description of equipment.

Unit : 05

Mixing : Solid – Solid mixing- Mechanisms of Mixers-V-type, paddle and Rototube mixers- selection of mixer- Mixing of viscous masses, kneading machines and ointment mills-Liquid-Liquid equipment, impellers- their characteristics.

Unit : 06

Size reduction and Separation : Importance of size reduction. Theories of size reduction, factors Influencing size reduction, energy in size reduction, cutter mill, ball mill ,fluid energy mill, hammer mill, colloid mill-Selection of machinery. Principles of size separation, particle size distribution- Representation of screens, screening equipment, trommels, shaking and vibrating screens gyratory screens, cyclone, air and hydraulic separator, bag – filter, Cottrell precipitator, scrubber, sedimentation theory.

TEXT BOOKS :

01. Introduction to chemical Engineering by Badger and Banchoff
02. Pharmaceutical Engineering by K.Samba Murthy
03. Principles of Engineering Drawing by A.C.Parkinson
04. Pharmaceutical Engineering by C.V.S.Subrahmanyam,
05. Pharmaceutical Engineering by Dr.Girish K.Jani
06. Introduction to Pharmaceutical Engineering by Dr.A.R.Paradkar
07. Cooper and Gunns tutorial pharmacy by S.J.Carter.

IIIV B.PHARMACY (3rd SEMESTER)

MODEL QUESTION PAPER

303 PHARMACEUTICAL ENGINEERING - I

Time : 3 hours

Max.Marks : 80

SECTION - A

Answer any four questions

(4 X 10 = 40 marks)

1. Define unit operation and unit process in pharmaceutical industry with suitable examples. Distinguish between lab scale, pilot scale and industrial scale operations.
2. Explain the working of gate valve, globe valve and diaphragm valve
3. Write the importance of materials used in pharmaceutical plant construction and merits, demerits of commonly used materials.
4. Describe the basic construction of refrigeration
5. Discuss the construction, working and advantages of mixer useful for wet granulation.
6. Explain the construction, working and applications of fluid energy mill.

SECTION - B

Answer any TEN questions

(10 x 4 = 40 marks)

7. Write the significance of Reynold's number
8. What do you understand by energy and mass balance
9. Write about the check valve and its applications
10. Distinguish between reciprocating pump and centrifugal pump
11. Define the terms relative humidity, humid heat, dew point and humid volume
12. What is corrosion ? How do you minimise it ?
13. Write the applications of humidity in pharmacy
14. Write the steps involved in refrigeration cycle
15. Write briefly on V-type mixer
16. What is air binding ? How it is prevented ?
17. Give the applications of colloid mill in pharmacy
18. Write short notes on sieve analysis.

IIIV B.PHARMACY (3rd SEMESTER)
304 PHARMACEUTICAL MICROBIOLOGY
(Theory) (75 hrs.)

Unit : 01

Study of morphology, classification of bacteria, yeasts, actinomycetes, protozoa, fungi and viruses. Mutation, Mutagens, Bacterial Conjugation, Transformation and transduction.

Unit : 02

Preparation of media for bacterial, fungal and actinomycete cultures. Different methods for isolation, purification and preservation of microbial cultures. Introduction to microbiology of water, air and milk and methods of quantitative evaluation of microbial contamination.

Unit : 03

Theory of staining, Gram, acidfast, flagella, spore staining methods. Study of bacterial growth : effect of UV light, ultrasonic waves, temperature, pH, osmotic pressure, salt concentration and metal ions.

Unit : 04

An outline of theories of antimicrobial action of drugs and chemicals. Study of sterilization by moist and dry heat, construction and working of autoclave, sterilization by filtration, radiations and gases. Dynamics of disinfection, disinfectants - the mechanism of action, merits and demerits. Evaluation of bacteriocides and bacteriostatics.

Unit : 05

Principles of immunology, methods of transmission of disease carriers, vectors and reservoirs, General methods of Immunization against diseases. Fundamentals of serology : Neutralization, Precipitation, Opsonization, agglutination, complement fixation tests and ELISA.

Unit : 06

The study of etiology, diagnosis, source of infection, mode of transmission, immunization methods, prevalence and control of the following diseases: Bacillary dysentery, diphtheria, tuberculosis, leprosy, cholera, syphilis, gonorrhoea, tetanus food poisoning, rabies, polio, detrameophytes, malaria and Amoebiasis, AIDS, Hepatitis.

IIIV B.PHARMACY (3rd SEMESTER)
305 PHARMACEUTICAL MICROBIOLOGY
(Practicals) (75 hrs.)

01. General rules and procedure in microbiology lab
02. Acquaintance of equipment in microbiology lab
03. Preparation of culture medium for bacteria and potato dextrose agar medium for fungi. Cultivation of microorganisms.
04. Aseptic culture transfer techniques.
05. Simple staining
- 06*. Gram staining
- 07*. Bacterial motility
08. Acid-fast staining
00. Negative Staining
10. Oligo dynamic action of copper
11. Isolation of pure cultures by streak plate method.
12. Spore Staining
13. Viable count of microbes of serial dilution method.
14. Rideal-walker test
15. Determination of antibiotic sensitivity
16. Effect of UV-rays on life of bacteria
17. Microscopic observation of fungi
18. Starch hydrolysis

TEXT BOOKS :

01. Microbiology by Pelczar
02. Text Book of Microbiology by Ananth Narayan.
03. Microbiology - An introduction by Toratora.
04. Microbiology by Prescott
05. Pharmaceutical Microbiology by Chandrakant R.Kokare
06. Immunology - by KUBY

IIIV B.PHARMACY (3rd SEMESTER)

MODEL QUESTION PAPER

304 PHARMACEUTICAL MICROBIOLOGY (Theory)

Time : 3 hours

Max.Marks : 80

PART - A

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

1. Explain in detail various modes of reproduction in bacteria
2. Explain different isolation and preservation methods of microbial cultures.
3. Explain various factors effecting bacterial growth
4. Classify disinfectants . Explain the mechanism of action of various disinfectants.
5. Define serology. Explain the principles involved in precipitation, agglutination, opsonization and complement fixation tests.
6. Explain the etiology, diagnosis, source of infection, immunization methods and control of Amoebiasis and syphilis.

PART - B

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

7. Differentiate Gram positive and Gram negative organisms along with neat diagrams
8. Classify viruses. Write about the structure of virus
9. Write two examples of differential media and selective media. Give the principle involved in use of these medias.
10. Write the quantitative evaluation methods for Milk
11. Define staining. Classify staining agents. Write the principle involved in staining.
12. Write the principle of gram's staining along with the procedure
13. Write the principle and working of autoclave.
14. Write the principle involved in sterilization by radiation and dry heat.
15. Define immunity. Write about various types of immunity.
16. Write the principle and procedure involved in different types of ELISA
17. Write the diagnosis, immunization methods and control of Tuberculosis.
18. Write diagnostic tests and control of Leprosy.

IIIV B.PHARMACY (3rd SEMESTER)

MODEL QUESTION PAPER (Practicals)

305 PHARMACEUTICAL MICROBIOLOGY

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

IIIV B.PHARMACY (3rd SEMESTER)

306 ANATOMY AND PHYSIOLOGY (Theory) (75 hrs.)

Unit : 01

Introduction : Introduction to anatomical terms in relation to parts of the body, systems and organs. Elementary knowledge of the human skeleton.

Tissues of the body: Properties and functions of epithelial, connective, muscular, nervous and osseous (bone) tissues. General principles of membrane permeability, diffusion, transport membrane potentials, action potentials.

Unit : 02

Nervous system : Neuron, synapses, ganglion, plexus, physiology of nerve impulse, neurotransmission, reflex arc, central nervous system (parts and functions) and autonomic nervous system.

Unit : 03

Cardiovascular system and Blood : Heart, blood Vessels, cardiac cycle, circulation, blood pressure and its regulation and blood (composition and functions)

Unit : 04

Respiratory system : Gross anatomy of respiratory passages, physiology of respiration, nervous control of respiration.

Digestive System : Gross anatomy of alimentary canal, movement of alimentary canal, gastric secretions and the enzymes involved in digestion.

Unit : 05

Endocrine System : Physiological considerations of thyroid, pancreas, pituitary, gonads and suprarenal glands.

Urinogenital System : General disposition of organs of excretion, physiological consideration of urine formation, out put, factors controlling it.

Unit : 06

Physiology of special senses : Hearing, vision, smell, taste and structure and functions of skin.

IIIIV B.PHARMACY (3rd SEMESTER)

307 ANATOMY & PHYSIOLOGY (Practicals) (75 hrs.)

1. Study of Histology slides of different tissues/organs
2. **Study of specimens and bones :**
(Human heart, Human skeleton, Human Digestive system, Human Nose, Human Skin, Human tongue, Human Respiratory system, Human Eye, Human Brain.)
3. Determination of blood pressure
4. Determination of blood groups.
5. Determination of haemoglobin content of blood.
6. Determination of R.B.C. content of blood.
7. Determination of W.B.C. content of blood
8. Determination of bleeding time.
9. Determination of clotting time.
10. Determination of differential leukocyte count of blood.
11. Determination of erythrocyte sedimentation rate of blood.
12. Recording of normal cardiogram of frog's heart.
13. Effect of heat and cold on normal cardiogram of frog's heart.

TEXT BOOKS :

01. Text book of Medical Physiology by A.C.Guyton
02. Human Physiology by A.J.Vander, J.H.Sherman and D.S.Lucion
03. Samson Wright's applied physiology by Keele and Neil
04. The Living Body - A text book in human physiology by Best and Taylor.
05. Principles of Anatomy & Physiology by Tortora and Grabowski.
06. Ross and Wilson - Anatomy and Physiology by Anne waugh and Allison Grant.
07. Human physiology by Dr.C.C.Chaterjee.

IIIV B.PHARMACY (3rd SEMESTER)

MODEL QUESTION PAPER

306 ANATOMY & PHYSIOLOGY

Time : 3 hours

Max.Marks : 80

SECTION - A

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

1. Classify the tissues and with a neat sketch discuss the functions performed by each type of these tissues.
2. What is a synapse ? How the nerve impulses are transmitted through synapses.
3. What is the role of C.V.S. in the body ? Describe in detail the origin and conduction of heart beat.
4. What is digestion ? Draw a sketch of digestive system, label and discuss in detail the digestion taking place in the small intestine.
5. Draw a neat diagram of eye and discuss the physiology of vision.
6. What are endocrine glands ? Classify the Endocrine glands and describe the functions of various hormones released by posterior pituitary glands.

SECTION - B

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

7. Write notes on transport of materials across the cell membrane.
8. Write notes on Action potential.
9. Write notes on Medulla oblongata.
10. Give notes on neurotransmitters.
11. Write about composition and functions of blood.
12. Write short notes on Anemia.
13. How the respiration is regulated ?
14. Give an account on transport of respiratory gases from lungs to tissues.
15. Write short notes on urine formation.
16. Give a brief note on role of pancreas.
17. Write short notes on skin.
18. Write short notes on ear.

IIIV B.PHARMACY (3rd SEMESTER)

MODEL QUESTION PAPER (Practicals)

307 ANATOMY & PHYSIOLOGY

Time : 4 hours

Max.Marks : 80

- | | | |
|---------------------|---|----------|
| 1. Identification | : | 10 Marks |
| 2. Synopsis | : | 10 Marks |
| 3* Major Experiment | : | 30 Marks |
| 4. Minor Experiment | : | 15 Marks |
| 5. Viva-Voce | : | 15 Marks |

Total: 80 Marks

III/IV B.Pharmacy (4th Semester)

401 PHARMACEUTICAL CHEMISTRY-III (MEDICINAL-I)

(Theory) (75 hrs.)

Unit : 01

Brief introduction to medicinal chemistry and development of medicinal chemistry, physicochemical properties of drugs in relation to biological action, drug receptor interaction, transduction mechanism and G-coupled receptors

Unit : 02

Sulphonamides: History, nomenclature, classification based on kinetics, clinical and chemical along with structures, metabolism crystal urea, prodrug concept in sulphonamides, structure activity relationship(SAR), Therapeutic uses metabolism and synthesis of sulphamethoxazole, trimethoprim, sulphacetamide, sulphapyridine, sulphasalazine, sulphamoxol, sulphafurazole, sulphaguanidine, sulphadoxine, sulphadimidine.

Antiinfective agents: Definition, classification, ideal requirements of antiinfectives, structures, synthesis and uses of important antiinfectives and synthesis of hexylresorcinol, nitrofurazone, chlorobutanol methylparaben.

Unit : 03

Antibiotics: Brief historical background and classification of antibiotics based on spectrum, nature, chemical and mechanism of action.

Penicillins: Historical background, biological sources, nomenclature, classification of penicillins based on source and spectrum of activity along with structures of different penicillins, degradation of penicillins, semi synthetic penicillins, the effect of stereochemistry in designing orally active penicillins, depot penicillin preparations, general method of synthesis of penicillins from 6-Amino penicillanic acid(APA), structure activity relationship(SAR), mechanism of action, synthesis and therapeutic uses of benzyl penicillin, ampicillin, amoxicillin, carbenicillin, phenoxymethyl penicillin. A note on β -lactamase inhibitors.

5. **Cephalosporins:** Biological sources, classification based on generation, degradation of cephalosporins, comparison of 6-Aminopenicillanic acid(APA) and 7-aminocephalosporanic acid (ACA), penam and cepham, structure activity relationship(SAR), advantages over penicillins, structures and synthesis of cephalexin, cephalexin, cefuroxime, cefatoxime, cefoperazone and cefaclor.

Tetracyclines : Biological sources, structures of the important tetracyclines, important structural units and the three acidity constants in the tetracycline molecule, amphoteric nature, epimerisation, chelation with metals, mechanism of action, spectrum of activity, structure activity relationship (SAR) and therapeutic uses.

Aminoglycosides: Structure, acid hydrolysis, mechanism of action, therapeutic uses, metabolism and toxicity of streptomycin. structure of dihydrostreptomycin and its importance. A mention of other aminoglycoside antibiotics. Synthesis, metabolism, SAR and therapeutic importance of levorotatory form of chloramphenicol.

Macrolides: Classification, structure activity relationship (SAR) metabolism and toxicity.

Fluoro Quinolone antibacterials : Structure activity relationship (SAR) of quinolones, metabolism and synthesis of norfloxacin, gatifloxacin, nalidixic acid, sparfloxacin, pefloxacin and ofloxacin.

Unit : 04

Antimalarials: Etiology of malaria, classification, mechanism of action, SAR, therapeutic uses, structures and synthesis of chloroquine, amodiaquine, primaquine, quinacrine, pyrimethamine and proguanil. A brief note on Artemisinin.

Anthelmintics: Definition, classification, mechanism of action of anthelmintics, synthesis and therapeutic uses of diethylcarbamazine, mebendazole, niclosamide, pyrantelpamoate, albendazole, piperazine citrate and niridazole

Antiamoebics: Classification and mechanism of action of antiamoebics, synthesis and therapeutic uses of metronidazole, diloxanide furoate, iodoquinol, furazolidone

Unit : 05

Antifungal agents: Introduction, classification, structures, mechanism of action and therapeutic uses of antifungal drugs, structure activity relationship(SAR) of azole antifungal agents, structures and synthesis of benzoic acid, salicylic acid, clotrimazole, ketoconazole, fluconazole, tolnaftate, miconazole, econazole, griseofulvin and flucytosine.

Anti-Tubercular Drugs: Introduction, classification, structure activity relationship (SAR), mechanism of action, structures of important antitubercular drugs and synthesis of INH, ethambutol, pyrazinamide, ethionamide and PAS

Antileprotics: Introduction, classification, structure activity relationship (SAR), metabolism, mechanism of action, synthesis of dapsone and clofazimine

Unit : 06

Antiviral Drugs : Properties of virus, types of viruses, viral replication, classification of antiviral drugs, chemical structures, mechanism of action and therapeutic uses of amantadine, nucleoside antimetabolites (idoxuridine, vidarabine, acyclovir, famciclovir), reverse transcriptase inhibitors (zidovudine, lamivudine, stavudine, zalcitabine), nucleoside antimetabolites (ribavirin), nonnucleoside reverse transcriptase inhibitors (nevirapine). A brief note on HIV protease inhibitors. Synthesis of amantadine and idoxuridine

Anticancer Drugs: Introduction, classification, mode of action, structures of important anticancer drugs, metabolism and synthesis of chlorambucil, cyclophosphamide, melphalan, cytarabine, 6-thioguanine, thiotepa, busulphan, procarbazine, carmustine, 5-fluorouracil, 5-mercaptopurine, methotrexate. A brief account of vinca alkaloids and taxol

TEXT BOOKS :

1. Text book of Medicinal Chemistry by William O. Foye, Lea Febiger, Philadelphia.
2. Wilson & Giswold's Text book of organic Medicinal Chemistry and pharmaceutical chemistry by JH Block & JM Beale (Eds), 11th Ed, Lipcott, Raven, Philadelphia, 2004.
3. D. Abraham (Ed), Burger Medicinal chemistry and Drug discovery, Vol. 1 & 2. John Wiley & Sons, New York 2003,
4. Lippincott Williams and Wilkins: Remington Pharmaceutical Sciences
5. Bentley and Driver's Textbook of Pharmaceutical Chemistry L.M. Atherden. Oxford University Press, Delhi.
6. B.N. Lads, MG.Mandel and F.I. way, Fundamentals of drug metabolism & disposition, William & Welking Co, Baltimore USA.
7. C. Hansch, Comprehensive medicinal chemistry, Vol 1 - 6 Elsevier Pergamon Press, Oxford 1991.
8. Daniel Lednicher, Strategies For Organic Drug Synthesis And Design, John Wiley, N. Y. 1998.
9. Rama Rao Nadendla, Medicinal chemistry, Pharma Book Syndicate, Hyderabad, 2006
10. D. Lednicher, Organic drug synthesis, Vol, 1 - 6, J.Wiley N.Y.

IIIIV B.Pharmacy (4th Semester)

MODEL QUESTION PAPER

PHARMACEUTICAL CHEMISTRY-II, (MEDICINAL -I)

Time : 3 hours

Max.Marks : 80

SECTION - A

Answer any four questions

(4 X 10 = 40 marks)

1. Outline the importance of any two physicochemical parameters in relation to biological activity. Explain with suitable examples.
2. Classify sulfonamides with examples, discuss the SAR and mention their mode of action.
3. Give the chemical classification of antibiotics. Give an account of the chemistry and stability of penicillin molecule.
4. What are antimalarials ? Classify them with examples and discuss the SAR ? Add a note on the current status of malaria in India.
5. What are antifungal agents ? Give the classification, mechanism and SAR of azole antifungal agents ?
6. What are antineoplastic agents ? Classify them with examples. Discuss the mode of action of alkylating agents ?

SECTION - B

Answer any TEN questions

(10 x 4 = 40 marks)

7. Explain briefly how partition coefficient influences biological activity ?
8. Define and classify receptors with suitable examples ?
9. Outline the synthesis and uses of sulfamethoxazole.
10. What is crystal urea ? Suggest the preventive measures of crystal urea.
11. Write a short note on β -lactamase inhibitors
12. Give an account of epimerisation and chelation of tetracyclins.
13. Outline the synthesis and mode of action of Albendazole.
14. Give the structure and chemical name of any two antiamoebic agents.
15. Give the synthetic scheme for flucytocine
16. Write short notes on anti-tubercular agents.
17. Give a brief note on chemistry of DNA polymerase inhibitors.
18. Write short notes on plant products used in cancer chemotherapy.

III/IV B.Pharmacy (4th Semester)

402 PHYSICAL PHARMACY-II (Theory) (75 hrs.)

Study of the applications of physicochemical principles to pharmacy with special reference to the following :

Unit : 01

Solubility and Distribution phenomena : Solvent-Solute interactions, solubility of gases in liquids, liquids in liquids, solids in liquids, distribution of solutes in immiscible solvents. Introduction to phenomena of diffusion : Ficks first law and second law.

Complexation : Types of Complexes, methods of analysis, complexation and drug action.

Unit : 02

Kinetics : Rates and orders of reactions, determination of order of a reaction. Influence of temperature and other factors on reaction rates. Decomposition of medicinal agents. Methods and principles of stabilization, accelerated stability analysis.

Unit : 03

Interfacial Phenomena : Liquid interfaces, measurement of surface and interfacial tensions, adsorption at liquid interfaces. Surface active agents, systems of hydrophilic – lipophilic classification. Adsorption at solid interfaces. Electrical properties of interfaces.

Unit : 04

Colloids and macromolecular systems : Types of colloidal systems, properties of colloidal Systems, solubilization.

Micromeritics : Particle size and size distribution, methods of determination of particle size, particle shapes and surface area. Derived properties of powders.

Unit : 05

Rheology : Newtonian and Non-Newtonian systems. Thixotropy, its measurement and applications in formulations. Determination of viscosity using rotational viscometers and its applications.

Unit : 06

Coarse Dispersions : Suspensions, emulsions and semisolids :

Suspensions : Interfacial properties of suspended particles, settling in suspensions, formulation of suspensions.

Emulsions : Theories of emulsification, physical stability of emulsions, preservation of emulsions.

Rheological properties of emulsions, suspensions and semisolids.

IIIIV B.Pharmacy (4th Semester)

403 PHYSICAL PHARMACY-II (Practicals) (75 hrs.)

01. Effect of phase volume ratio on stability of an emulsion.
02. Micromeritics – I
03. Micromeritics – II
04. Determination of partition coefficient of salicylic acid between water and benzene
05. Determination of first order rate constant associated with decomposition of hydrogen peroxide.
- 06*. Determination of HLB value of Tween-80
- 07*. Determination of critical micellar concentration of tween-80.
08. Micellar solubilisation of poorly soluble drugs.
- 09*. Determination of first order rate constant associated with decomposition of ethyl acetate
10. Determination of particle size by stokes method.
11. Accelerated stability testing of a tablet formulation-I.
12. Accelerated stability testing of a tablet formulation – II.
13. Accelerated stability testing of a tablet formulation by short cut method.
- 14*. Calibration of eye piece micrometer using stage micrometer and determination of globule size of an emulsion.
- 15*. Study of adsorption of oxalic acid on charcoal.

TEXT BOOKS :

- 01.Physical Pharmacy by Alfred Martin
- 02.Remington's Pharmaceutical Sciences.
- 03.Tutorial pharmacy.

IIIV B.Pharmacy (4th Semester)

MODEL QUESTION PAPER

402 PHYSICAL PHARMACY-II (Theory)

Time : 3 hours

Max.Marks : 80

SECTION - A

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

01. State and explain Nernst's distribution law. Discuss its application in determination of stability constant of a complex with an example.
02. Discuss the principle and method involved in accelerated stability testing of dosage forms. Give its limitations.
03. With a neat labelled diagram explain the concept of electric double layer at solid liquid interfaces. Give the significance of zeta potential in formulations of suspensions.
04. What are colloids. Discuss the optical and kinetic properties of colloids.
05. What is thixotropy. Discuss the methods to measure it and give applications of thixotropy in pharmacy.
06. Differentiate between flocculated and deflocculated suspension. Taking an example, explain about controlled flocculation.

SECTION-A

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

07. State and explain Fick's first law of diffusion.
08. Give the applications of complexation in pharmacy.
09. Differentiate between zero order and first order kinetics.
10. A tablet contains 500 mg of paracetamol. The tablet was manufactured on 10/07/1999. Paracetamol in the tablet decomposes according to zero order kinetics at the rate of 10 mg/year. What is the expiry date to be printed on the label.
11. What is HLB value. Give the functional classification of surfactants basing on HLB value. Give any one method for determination of HLB value of a surfactant.
12. Write notes on spreading and spreading coefficient.
13. What is total porosity, inter particle porosity and inter particle porosity. Give its significance in pharmacy.
14. Write notes on micellar solubilization.
15. How do you determine the viscosity of a pseudoplastic system using Stormer viscometer.
16. Discuss the rheology of Bingham bodies.
17. How do you evaluate the physical stability of emulsions.
18. Write notes on sedimentation parameters of suspensions.

IIIV B.Pharmacy (4th Semester)

MODEL QUESTION PAPER (Practicals)

403 PHYSICAL PHARMACY-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

IIIIV B.Pharmacy (4th Semester)
404 APPLIED BIO CHEMISTRY & CLINICAL
PATHOLOGY (Theory) (75 hrs.)

Unit : 01

Definition, classification, some properties and reactions of carbohydrates, lipids and proteins. Diseases related to their metabolism.

Unit : 02

Carbohydrate metabolism : Glycolysis, glycogenolysis, gluconeogenesis, Krebs' cycle, direct oxidative pathway (HMP). Metabolism of lipids. Essentials of fatty acids, Oxidation of fatty acids, ketogenesis, biosynthesis of fatty acids and cholesterol.

Unit : 03

Metabolism of Proteins and Amino acids : Essential and Non essential Amino acids, general metabolic reactions of amino acids like deamination, transamination, decarboxylation, urea cycle : metabolism of the following aminoacids, glycine, phenylalanine, tyrosine, cysteine, methionine, tryptophan, valine and lysine.

Unit : 04

Enzymes: classification, structure, mechanism of enzyme action properties, factors influencing enzyme action, activators and deactivators of enzymes, competitive and noncompetitive inhibition with respect to drug action, co-enzymes.

Unit : 05

Bio-chemistry of important body fluids. The biochemical role of minerals, water vitamins and hormones. A brief outline of energy and phosphate metabolism and detoxication mechanisms.

Unit : 06

The Principles involved and the method used in qualitative and quantitative analysis of

a) Blood for the following constituents :

Glucose, urea, cholesterol, bile salts, bile pigments, creatinine, calcium, phosphates, SGPT and SGOT.

b) Urine for the following constituents :

Glucose, ketone bodies, bile Salts, bile pigments, and albumin

c) Introduction to pathology of blood and urine

- (1) Lymphocytes and Platelets, their role in health and disease
- (2) Erythrocytes Abnormal cells, their significance
- (3) Abnormal constituents of urine and their significance in disease.

III/IV B.Pharmacy (4th Semester)

**405 APPLIED BIOCHEMISTRY & CLINICAL PATHOLOGY
(Practicals) (75 hrs.)**

01. Qualitative analysis of carbohydrates
(Glucose, Fructose, Maltose, Lactose, Sucrose, Starch).
02. Qualitative analysis of Amino acids (Glycine, Tyrosine, Cysteine)
03. Qualitative analysis of Proteins (Albumin, Casein, Gelatin, Peptone)
04. Identification of normal and abnormal constituents in normal urine sample.
05. Identification of abnormal constituents in the given sample.
- 06*. Estimation of glucose in urine.
- 07*. Colorimetric estimation of tyrosine.
- 08*. Estimation of creatinine in urine.
- 09*. Estimation of glucose in blood.
- 10*. Estimation of creatinine in blood.
- 11*. Estimation of valine by formal titration.
12. Simple enzymatic reaction.

TEXT BOOKS :

01. Text book of Biochemistry by Harper
02. Text book of Biochemistry by Lelinger
03. Biochemistry by A.V.S.Rama Rao
04. Biochemistry by West and Todd.
05. Biochemistry by U.Satyanarayana.
06. Text book of Biochemistry by D.M.Vasudevan, Sree Kumari S
07. Medical Biochemistry by N.Mallikarjuna Rao
08. Text book of Biochemistry with clinical correlatives by Devlin.

IIIV B.Pharmacy (4th Semester)

MODEL QUESTION PAPER

404 BIOCHEMISTRY (Theory)

Time : 3 hours

Max.Marks : 80

SECTION - A

Answer any four questions

(4 X 10 = 40 marks)

1. Explain the color reactions of proteins.
2. Discuss the direct oxidative pathway for the metabolism of glucose
3. Explain the general metabolic reactions of amino acids
4. What are enzymes ? Give the classification of enzymes with suitable examples.
5. Write an essay on biochemistry of body fluids.
6. Write the principles of methods used in quantitative analysis of calcium and creatinine in blood ?

SECTION - B

Answer any TEN questions

(10 x 4 = 40 marks)

7. What are essential and non-essential amino acids ?
8. Discuss the Haworth's cyclic structures of monosaccharides
9. Write a short note on ketogenesis
10. Write a short note on HMP pathway
11. Explain the biosynthesis of urea
12. Discuss briefly about the metabolism of glycine
13. Write a note on mechanism of enzymic action.
14. Write short notes on coenzymes.
15. Give an account of phosphate metabolism.
16. Explain the biochemical role of vitamin-C
17. Role of lymphocytes in health and disease.
18. How do you identify glucose and blood in urine ? Give the significance of above two abnormal constituents.

IIIV B.Pharmacy (4th Semester)

MODEL QUESTION PAPER (Practicals)

405 APPLIED BIO-CHEMISTRY AND CLINICAL PATHOLOGY

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

IIIIV B.PHARMACY (4th SEMESTER)
406 FORENSIC PHARMACY (Theory) (75 hrs.)

Unit : 01

Evolution of pharmaceutical and drug legislation in India –Code of Pharmaceutical ethics.

Legislation to regulate the profession of the pharmacy. The pharmacy Act, 1948.

Unit : 2 & 3

Legislation to regulate the import, manufacture, distribution and sales of drugs and cosmetics – The Drugs and cosmetics Act 1940 and Drugs and Cosmetics Rules 1945, as corrected upto –date.

Unit : 04

Legislation to control the advertisements , excise duties and price of drugs.

- a) The Drugs and Magic Remedies (Objectionable advertisement Act.)
- b) The Medicinal and Toilet preparations
(Excise duties Act and Rules of 1956)
- c) Drugs (Price Control) Order ,1970 as corrected upto-date

Unit : 05

Legislations to control the operations regulating to dangerous drugs, poisons and opium.

- a) Poisons Act and Rules
- b) The Narcotic Drugs and Psychotropic Substances act, 1985.

Unit : 06

Other Legislation's relating to Pharmaceutical Industry and profession.

- a) The Indian Patents and Designs Act,1970 with reference to the Drugs and Pharmaceuticals only.
- b) Medical Termination of Pregnancy Act.
- c) Shops and Establishments Act
- d) Prevention of Cruelty to Animals Act 1960.

TEXT BOOKS :

01. Forensic Pharmacy by B.M.Mithal
02. Forensic Pharmacy by N.K.Jain
03. Text book of Forensic Pharmacy, C.K.Kokate, S.B.Gokhale
04. Forensic Pharmacy by B.S.Kuchekar, A.H.Khadatara, Sachin.C. Itkar.
05. Pharmaceutical jurisprudence and ethics by S.P.Agarwal, Rajesh Kanna

IIIV B.PHARMACY (4th SEMESTER)

MODEL QUESTION PAPER

FORENSIC PHARMACY

Time : 3 hours

Max.Marks : 80

SECTION-A

Answer any FOUR questions

(4 X 10 = 40 marks)

1. What are the objectives of pharmacy act, Discuss the constitution and functions of pharmacy council of India
2. Classify the licenses issued for the sale of drugs. Explain the licensing requirements and procedure involved in retail sale of drugs.
3. What are the administrative bodies constituted under drugs and cosmetics act. Write the constitution and functions of DTAB
4. Define (A) Bonded manufactory (B) Proof spirit. Explain the steps involved in the manufacture of medicinal preparations in a bonded manufactory
5. What are narcotic drugs and psychotropic substances. Explain the various controlled operations and measures taken by central government to prevent illicit traffic in narcotics and psychotropic substances
6. What is (A) Patent (B) Invention. Mention the inventions patentable under the patents act. Write the procedure involved in patenting

SECTION - B

Answer any TEN questions

(10 X 4 = 40 marks)

7. Enumerate the events before 1940 that led to the enactment by pharmacy act.
8. Explain the code of ethics of pharmacist in relation to trade.
9. Mention the classes of drugs prohibited for import into india. Write the procedure for importing drugs.
10. What are the qualifications and duties of government analyst.
11. Write a note on schedules to the drugs and cosmetics act 1945.
12. Define (A) drug (B) cosmetic (C) Misbranded drug (D) Spurious drug.
13. What are the salient features of DPCO 1987 and DPCO 1995.
14. List out the advertisements prohibited under objectionable advertisement act.
15. What is opium poppy. Explain the cultivation of opium.
16. Write short notes on poisons act and rules.
17. What are the conditions of working laid down under the shops and establishment act.
18. Write the constitution and functions of Institutional animal ethics committee.

**407 ENGLISH & COMMUNICATION SKILLS
(LANGUAGE LABORATORY) (Practicals) (50 hrs.)**

01. Functional and advanced grammar
 - i. Basics of english language
 - ii. Tips to learn english language
 - iii. Articles
 - iv. Complete version of parts of speech
 - v. Complete version of tenses
 - vi. Direct and indirect speech
 - vii. Active and passive voice
 - viii. Analysis of sentences
 - ix. Degrees of comparison
 - x. Question tags
02. Verbal and Non-Verbal Skills
 - i. Verbal - concerned with words only; corresponding word for word.
 - ii. Non - verbal - posture and gesture; facial expressions; sign or code language.
03. Accent – Modulation / Pronunciation
 - i. Word accent
 - ii. Stress and rhythm in corrected speech
 - iii. Intonation - falling pitch, rising pitch, rising – falling tone
 - iv. Some common errors in pronunciation
04. Vocabulary Enhancement
 - i. Level -I words
 - ii. Level - II words
 - iii. Level – III words
 - iv. Synonyms and antonyms and their basic word
05. Speaking / Writing Tasks
 - i. Topics to be practiced orally and in written form to enhance speaking skills and writing skills.
06. Presentation Skills
 - i. Model presentation
 - ii. Resume preparation
 - iii. Conversation and telephone etiquette skills

07. Extempore / Elocution
 - i. Students are advised to involve in this activity as it develops one's potentiality and to a creative way of thinking and their involvement in general awareness.
08. Personality Development
 - i. The art of being dynamic – four dimensions
 - ii. Self-analyzing questions
 - iii. Human refinement and soft Skills
09. Communication Skills
 - i. Value of English
 - ii. Status of english in India
 - iii. Language and communication skills
 - iv. Communication skills in corporate requirements
10. Group Discussions
 - i. Group dynamics
 - ii. Some selected GD topics for practice purpose
11. Interview Skills
 - i. Basics of interview skills
 - ii. Preparing yourself for the interview
 - iii. How to face interview board
 - iv. Ten worst interview blunders
 - v. Sample questionnaire and answers
12. Practice tests for IELTS and TOEFL
 - i. A blueprint of IELTS and TOEFL
 - ii. Most often asked questions in IELTS / TOEFL
13. Reflection of Perfection
 - i. Value of being perfect
 - ii. A short inspiring story on the importance of perfection
14. Key to Success
 - i. Formula for Success
 - ii. Ten steps for Transformation
 - iii. Tips to learn English Grammar and Spoken English

TEXT BOOKS :

1. English Lab for B.Pharmacy Students by **Anthony**
2. Interview and Group discussion skills with mind blowing questions and top class logical answers by **Anthony**
3. English grammar and composition by **Wren & Martin**

IIIV B.PHARMACY (4th SEMESTER)

MODEL QUESTION PAPER

English & Communication Skills (Language Lab)

Time : 3 hours

Max.Marks : 80

01. Write all the rules and regulations of Direct speech and indirect (5M)
speech.
02. Write About Pronoun (5M)
03. Choose the correct word from the pair (5M)
- a. The movie was (so/such) boring she fell a sleep
 - b. She (lie/lay) down for a short nap
 - c. She should be arriving (shortly/briefly)
 - d. She (laid/lay) the book on the table.
 - e. You can choose from (among/between) five prizes.
04. Choose the correct form of the verb. (5M)
- a. I would like _____ the President of our country
To meet/meet/meeting
 - b. Shall I _____off the TV ?
Turn / Turning / to turn
 - c. You didn't need _____any more eggs.
Buy / to buy / buying
 - d. Could I _____ your dictionary, please ?
To borrow / Borrow / Borrowing
 - e. Do we have _____now ?
To leave / Leaving / Leave
05. Essay writing - "Global warming" ? (10M)
06. Extempore (10M)
07. Language laboratory online exercises in Language laboratory (40M)