

Total No. of Questions : 6]

SEAT No. :

P538

[4649] - 101

[Total No. of Pages : 3

First Year B.Pharmacy
1.1 : PHARMACEUTICS - I
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Answer to the two sections should be written in separate books.*
- 2) *Neat diagram must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

SECTION - I

Q1) Define dosage form. Discuss the classification of dosage form and add a note on targeted drug delivery. **[10]**

OR

Define bioavailability and bioequivalence. Explain the factors affecting drug absorption and distribution.

Q2) Attempt any Five **[15]**

- a) What is Pharmacopoeia? Add a note on United States Pharmacopoeia.
- b) Enlist the applications of radiopharmaceuticals.
- c) Describe various packages for liquid dosage forms.
- d) Describe Homoeopathy as an alternate system of medicine.
- e) Enlist the different routes of drug administration; explain in brief regarding rectal route of drug administration.
- f) Explain the ideal characteristics of packaging materials.
- g) Explain the development of pharmacy profession in India.

P.T.O.

Q3) Write short notes (any three)

[15]

- a) Additives used in dosage forms.
- b) Drug Metabolism.
- c) Unit dose packing for solid dosage forms.
- d) Dose response curve for multiple dose administration.
- e) Phases of clinical trials.

SECTION - II

Q4) Define filtration. Explain factors affecting rate of filtration with the help of Darcy's Law.

[10]

OR

Define solutions. What are different methods of preparation of solutions and write in details factors affecting rate of solution.

Q5) Solve any five:

[15]

- a) What are syrups? Comment on cough syrup.
- b) Draw a neat labeled diagram of Air Separator.
- c) Define size separation. Explain Multistage Elutriator.
- d) What are filter aids? Explain their ideal characteristics and working.
- e) How monophasic liquids are evaluated?
- f) Give the grading of powders according to I.P.
- g) Write a note on ORS.

Q6) Solve any three:

[15]

- a) Write differences between simple aromatic waters and concentrated aromatic waters. Explain simple distillation method and solution method.
- b) Describe wet granulation method with the help of flow chart. Enlist merits and demerits of wet granulation method.
- c) Explain Ball mill with its principle, construction, working, advantages, disadvantages and applications.
- d) Write note on :
 - i) Impellers.
 - ii) Effervescent Granules.
- e) Define elixirs. Discuss Piperazine Citrate Elixir B.P.C.



Total No. of Questions : 6]

SEAT No. :

P710

[Total No. of Pages : 2

[4649]-102
First Year B.Pharmacy
MODERN DISPENSING PRACTICES
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

SECTION - I

Q1) Answer any one. [10]

- a) Explain good compounding and dispensing practice and elaborate on documentation required for purchase and stock record.
- b) Explain prescription; explain types and parts of prescription in detail.

Q2) Answer any five. [15]

- a) Write a detail note on ADR.
- b) Write a note on "Code of Pharmaceutical ethics".
- c) Give storage condition for dispensed product.
- d) Give patient counseling for cosmetic product.
- e) What would be the dose of child of 3 and 12 years; if the adult dose is 100 mg.
- f) Write a note on PMR.
- g) Define molarity, normality, millimoles and milliequivalence.

Q3) Answer any three. [15]

- a) Comment on "Pharmacist as health care provider".
- b) Explain the steps in patient counseling and write a note on patient counseling for prescription drugs.
- c) Give in detail fundamental operation of compounding and dispensing.
- d) Using freezing point method how will you prepare 1% solution of boric acid, iso - osmotic with blood plasma. (Hints : freezing point of 1% w/v solution of boric acid is -0.288°C). The freezing point of 1%w/v solution of NaCl is -0.576°C)

P.T.O.

SECTION - II

Q4) Solve any one of the following. **[10]**

- a) Describe Chemical incompatibility.
- b) Describe formulation and compounding of Suppositories.

Q5) Solve any five from the following in brief. **[15]**

- a) Explain in brief methods for compounding of ointments.
- b) Explain in brief dusting powders for external use.
- c) Explain patient counseling in hypertension condition.
- d) Describe role of Pharmacist in family planning.
- e) Explain reporting of adverse drug interaction.
- f) Explain in brief counseling in self medication.
- g) Describe legal requirement for establishment of retail drug store.

Q6) Write short note on following (any three) : **[15]**

- a) Role of Pharmacist in drug interactions.
- b) Ointment bases.
- c) Patient counseling for prescription drug.
- d) Rational drug use.
- e) Ligatures and sutures.



Total No. of Questions : 6]

SEAT No. :

P539

[4649] - 103

[Total No. of Pages : 3

First Year B.Pharmacy

**1.3 : PHARMACEUTICAL INORGANIC CHEMISTRY
(2008 Pattern)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) All questions are compulsory.*
- 2) Answers to the two sections should be written in separate answer books.*
- 3) Figures to the right indicate full marks.*

SECTION - I

Q1) What are radiopharmaceuticals? Discuss the properties of α , β and γ radiations. **[10]**

OR

Classify water and Explain in detail the methods for removing the hardness of water.

Q2) Attempt ANY FIVE of the following. **[15]**

- a) Discuss role of buffers in pharmacy.
- b) Write quality control test for dental product I.P.
- c) Assay of copper sulphate as per I.P.
- d) Write the limit test for lead as per I.P.
- e) Explain the nuclear radiation measurement.
- f) Write a note on antidotes.
- g) Raw materials as source of impurities in pharmaceuticals.

P.T.O.

Q3) Write notes on ANY THREE of the following: **[15]**

- a) Role of oxygen in biological system.
- b) Adsorbents and Absorbents.
- c) Antacid.
- d) Electrolyte combination therapy.
- e) Physiological role of copper.

SECTION - II

Q4) Define preservative. Explain the role of preservatives in pharmaceuticals with examples. **[10]**

OR

Define and discuss about acid, base and buffers, explain how it used in pharmaceuticals with examples.

Q5) Attempt ANY FIVE of the following: **[15]**

- a) Water for injections.
- b) Electrolyte combination therapy
- c) Assay of Ferrous sulphate as per I.P.
- d) Give classification of antioxidants
- e) Physiological roll of sodium chloride
- f) Write the limit test for heavy metals as per I.P.
- g) Assay of potassium permanganate as per I.P.

Q6) Write notes on ANY THREE of the following:

[15]

- a) Factors affecting purity of pharmaceuticals.
- b) Application of radiopharmaceuticals.
- c) Physiological acid base balance.
- d) Properties of aluminum hydroxide.
- e) Physiological acid base balance.

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Total No. of Questions : 6]

SEAT No. :

P540

[4649] - 104

[Total No. of Pages : 3

First Year B.Pharmacy

**PHARMACEUTICAL ORGANIC CHEMISTRY - I
(2008 Pattern)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Figures to the right indicate full marks.*

SECTION - I

Q1) Enlist various classes of organic reactions with suitable example. Explain substitution bimolecular (SN^2) reaction with mechanism, stereochemistry giving suitable example. **[10]**

OR

Enlist various factors affecting nucleophilic substitution reaction. Explain each factor in detail giving suitable example.

Q2) Solve any Five **[15]**

- a) Compare stability of Primary, secondary, tertiary carbocation with suitable example.
- b) What is Huckels rule of aromaticity? Explain with suitable example.
- c) Give differentiation between pi bond and sigma bond.
- d) Define Hybridization. Enlist various types with suitable example.
- e) Explain Geometrical isomerism with suitable example.
- f) Give reason, why methylamine is stronger base than ammonia?
- g) Draw resonance structures of following.
 - i) Phenol
 - ii) Aniline

P.T.O.

Q3) Answer the following any three.

[15]

- a) Explain S_Ni reaction with mechanism, stereochemistry giving suitable example.
- b) Write synthesis of following compounds starting from benzene.
 - i) 1, 3 dinitrobenzene
 - ii) P - bromobenzene
- c) Draw structure of following
 - i) 2 - bromo - 2 - methylbutane
 - ii) 1 - chloro - 1, 2, diphenyl propane
 - iii) 4 - methyl aniline
 - iv) 2, 4, 6, - tribromoaniline
 - v) 4 - nitrotoluene
- d) What is inductive effect? Explain with suitable example.
- e) Explain nitration of benzene with suitable example.

SECTION - II

Q4) What are elimination reactions? Discuss E₁ and E₂ mechanisms in brief. **[10]**

OR

What are halogenation reactions? Discuss mechanism and kinetics of halogenation reaction in brief.

Q5) Solve any five.

[15]

- a) Give and explain any two reactions of amines.
- b) What is Saytzeff rule of Elimination? Explain with suitable example.
- c) Give any two methods for preparation of phenol with suitable example.
- d) Arrange following compounds in increasing order of acidity and Justify the arrangement.
 - i) Formic acid
 - ii) Acetic acid
 - iii) Chloroacetic acid
- e) Give any two preparation methods of sulphonic acids with suitable examples.
- f) What is cannizzaro reaction? Explain with suitable example.
- g) Give any two methods for preparation of amines.

Q6) Write short notes on any three of the following.

[15]

- a) E1 cb Reaction
- b) Aldol condensation reaction.
- c) Elimination versus substitution reaction.
- d) Hydrogenation reaction with suitable example.
- e) Methods for preparation and reactions of carboxylic acid with suitable examples.



Total No. of Questions : 6]

SEAT No. :

P541

[Total No. of Pages : 2

[4649] - 105
First Year B. Pharmacy
HUMAN ANATOMY AND PHYSIOLOGY
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answers to the two sections should be written in separate books.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*
- 4) All questions are compulsory.*

SECTION - I

Q1) Explain in detail mechanism of blood clotting. **[10]**

OR

Draw a neat labelled diagram of cell and explain movement of material across plasma membrane

Q2) Solve any five **[15]**

- a) What is composition and function of blood?
- b) Discuss structure of lymph node.
- c) Enlist respiratory organs with their functions.
- d) Explain conducting elements of heart.
- e) What are different types of tissues?
- f) Explain secretions and functions of salivary gland.
- g) Draw a neat labelled diagram of internal structure of heart.

Q3) Write short notes on (any three) **[15]**

- a) Blood groups
- b) Regulation of blood pressure
- c) Physiology of respiration
- d) Structure and function of liver
- e) E C G

P.T.O.

SECTION - II

Q4) Draw a neat labelled diagram of Female reproductive system. Explain in detail physiology of menstruation. **[10]**

OR

Draw a neat labelled diagram of kidney. Explain in detail functions of kidney. **[10]**

Q5) Solve any five **[15]**

- a) Explain structure and function of ear. **[3]**

- b) Draw a neat labelled diagram of central nervous system. Explain functional areas of cerebrum. **[3]**
- c) Discuss peripheral nervous system. **[3]**
- d) Explain the physiological role of hormones of anterior pituitary gland. **[3]**
- e) Discuss male reproductive system and hormones involved in it. **[3]**
- f) Discuss functions of skin. **[3]**
- g) Discuss physiology of micturition. **[3]**

Q6) Write short notes on any three **[15]**

- a) Renin angiotensin aldosterone system. **[5]**
- b) Sympathetic nervous system. **[5]**
- c) Physiology of muscle contraction. **[5]**
- d) Synapse and Neurotransmitters. **[5]**
- e) Pancreatic islets. **[5]**



Total No. of Questions : 6]

SEAT No. :

P546

[Total No. of Pages : 2

[4649] - 202

S.Y. B.Pharmacy

Pharmaceutical Microbiology and Immunology

(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

SECTION - I

Q1) What is bacteriophage? Explain in detail multiplications of bacteriophage by lytic cycle. **[10]**

OR

Explain in detail growth curve of bacteria. How will you calculate number of generations and time required for each generation?

Q2) Answer the following (Any Five): **[15]**

- a) Write the characteristics of Rickettsia.
- b) What is lysogeny?
- c) Differentiate between Trichophyton and Epidermophyton.
- d) Write the functions of bacterial capsules.
- e) Explain different types of microbial spoilage.
- f) Explain different techniques used for preservation of microbial cultures.
- g) Draw the ray diagram of compound microscope.

P.T.O.

Q3) Write note on (Any Three):

[15]

- a) Preservative efficacy test.
- b) Importance of fungi.
- c) Importance of electron microscopy.
- d) Isolation of actinomycetes.
- e) Koch's Postulates.

SECTION - II

Q4) What is hypersensitivity? Write the classification of hypersensitivity reactions. Explain the mechanism of type - I hypersensitivity reaction with suitable diagrams.

[10]

OR

Explain in detail about production and applications of monoclonal antibodies.

Q5) Answer the following (Any Five):

[15]

- a) Define:
 - i) D-value.
 - ii) Disinfection.
- b) Write the importance of microbial assays.
- c) Explain the media used for sterility testing.
- d) Differentiate between exotoxins and endotoxins.
- e) Write the advantages and disadvantages of membrane filtration.
- f) What is an allergenic extract? Explain.
- g) Explain the principle of sterilization by radiations.

Q6) Write a note on (Any Three):

[15]

- a) DPT.
- b) MIC.
- c) HEPA filter.
- d) IgM.
- e) ELISA.



Total No. of Questions : 6]

SEAT No. :

P547

[Total No. of Pages : 2

[4649] - 203

Second Year B.Pharmacy

2.3 : Pharmaceutical Biochemistry

(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Q.No.1 and Q.No. 4 are compulsory.
- 2) Answers to the two sections should be written in separate answer books.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Figures to right side indicate full marks.

SECTION - I

Q1) Define and classify proteins with one structure from each class and explain the isoelectric PH and precipitation methods of proteins. [10]

OR

Define and explain anabolism and catabolism and anaerobic pathway of Glycolysis. Also explain energetic and regulation of Glycolysis cycle.

Q2) Solve any five: [15]

- a) Give the allosteric inhibition and regulation of enzymes.
- b) Explain reducing and non reducing sugars give the differential test for the same.
- c) Na⁺ and K⁺ pump.
- d) Deamination.
- e) Pasture and crab free effect on Glycolysis cycle.
- f) Cori cycle.
- g) Significance of 2-3-BPG-cycle.

P.T.O.

Q3) Solve any three: [15]

- a) Biomembrane structure and function.
- b) Functions of lipids.
- c) Urea cycle.
- d) Mechanism of enzyme action.
- e) Biosynthesis of cholesterol.

SECTION - II

Q4) Enlist different advance diagnostic techniques and explain in detail PCR.[10]

OR

Describe the Transcription and Translation in prokaryotic cell.

Q5) Solve any five: [15]

- a) Disorders of Lipoprotein.
- b) Write a note on Ricketes and Beriberi.
- c) Glucose tolerance test.
- d) Nutritional importance of protein and carbohydrate.
- e) Classification of Carbohydrate.
- f) Specific dynamic action.
- g) Disorder of fructose metabolism.

Q6) Solve any three: [15]

- a) RIA.
- b) Define & classify vitamin and give physiological Role of Vit B₁ or Vit B₂.
- c) Immunofluorescence.
- d) Genetic Codon & Wobble hypothesis.
- e) Test for bile pigment.



Total No. of Questions : 8]

SEAT No. :

P548

[Total No. of Pages : 2

[4649] - 204

S.Y. B.Pharmacy

Pharmaceutical Organic Chemistry - II

(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Q.No. 1 and Q.No. 5 are compulsory, out of the remaining attempt any two questions from Section - I and two questions from Section - II.
- 2) Figures to the right indicate full marks.

SECTION - I

Q1) a) Draw configurational structures of any four of the following: [4]

- i) meso-2,3-dichlorobutane.
- ii) R-2-Aminobutanal.
- iii) S-Lactic acid.
- iv) R-glyceraldehyde.
- v) SSS-2,3,4,5-tetrahydroxy-pentanal.

b) Comment on (any three): [12]

- i) Conformational isomerism in n-butanol.
- ii) Beckmann rearrangement.
- iii) Absolute configuration.
- iv) Conformations of cyclohexane.

Q2) What is combinatorial synthesis? Comment on multiple parallel synthesis in Combinatorial chemistry. Give details of Tea Bag method. [12]

Q3) What is "Racemic Resolution"? Explain with suitable examples racemic resolution by diastereoisomer formation with a detailed account of factors affecting the costing of product under resolution. [12]

P.T.O.

Q4) Write short notes on (any four): **[12]**

- a) Solid supported synthesis of peptides.
- b) Conformational and geometrical isomerism of 1,2-dimethyl cyclohexanes.
- c) Isoelectric point of amino acids.
- d) Sequence Rules for R & S notations.
- e) N-Terminal assay of polypeptides.

SECTION - II

Q5) Write short notes on (with 2 examples each): **[16]**

- a) Benzofuran synthesis.
- b) Hinsberg thiophene synthesis.
- c) Reactivity of indole.
- d) Reactivity of Pyridine.

Q6) Give two synthetic methods and two reactions for any three 5-membered heterocycles. **[12]**

Q7) Give mechanism with evidences and two examples of the following rearrangements (any three): **[12]**

- a) Cope.
- b) Curtius.
- c) Beckman.
- d) Benzilic acid.

Q8) a) Give detailed account of muta-rotations of (+) Glucose and (+) Maltose. **[6]**

- b) What is cyclic structure of maltose? Establish cyclic structure with chemical evidences. **[6]**



Total No. of Questions : 6]

SEAT No. :

P549

[Total No. of Pages : 2

[4649] - 205
S.Y. B.Pharmacy
Pharmaceutical Analysis - I
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Answer three questions in each section.*
- 2) Answers to the two sections should be written in separate answer books.*
- 3) Figures to the right indicate full marks.*

SECTION - I

Q1) Solve ANY ONE:

[10]

- a) Explain the theories of indicator action for neutralization indicators.
- b) List unit operations in gravimetry. Explain the step of precipitation in details.

Q2) Solve ANY FIVE:

[15]

- a) Compare co-precipitation and post-precipitation.
- b) Explain the term "half shade effect" in polarimetry.
- c) State construction of Normal Hydrogen electrode.
- d) Explain precipitation from homogenous solution.
- e) Classify neutralization indicators.
- f) State methods for analysis of organomercurials.
- g) Explain the graph obtained during conductometric titration of weak acid vs. strong base.

P.T.O.

Q3) Write short notes on (ANY THREE): [15]

- a) Oxygen flask combustion technique.
- b) Electrodes for conductometric titrations.
- c) Student's t-test.
- d) Optical rotatory Dispersion.
- e) Fajan's indicators.

SECTION - II

Q4) Solve ANY ONE: [10]

- a) State and explain various methods of endpoint detection in precipitation titrations.
- b) How will you prepare and standardize 0.05M Disodium edetate solution as per I.P.?

Q5) Solve ANY FIVE: [15]

- a) State types of non-aqueous solvents.
- b) Explain the factors affecting stability of metal-ligand complex.
- c) What is the role of Digestion in gravimetry? How is it performed?
- d) Compare Iodimetry vs. Iodometry.
- e) Classify determinate errors.
- f) How will you assay "Sodium chloride injection I.P."?
- g) Define buffer capacity.

Q6) Write short notes on (ANY THREE): [15]

- a) Method for determination of "Organically bound nitrogen".
- b) Ion selective electrodes.
- c) Metalochrome indicators.
- d) Sulphanilamide assay.
- e) Titanous chloride titrations.



Total No. of Questions : 6]

SEAT No. :

P550

[Total No. of Pages : 2

[4649] - 206
S.Y. B.Pharmacy
PHARMACOGNOSY - I
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) Define evaluation of crude drug. Describe in detail Microscopical and Morphological evaluation of crude drugs. **[10]**

OR

Define Pharmacognosy. Explain the role of various scientist in the development of Pharmacognosy and elaborate the scope and importance of Pharmacognosy in the field of pharmacy.

Q2) Answer the following (Any Five): **[15]**

- a) Give the advantages of the cultivation of crude drugs.
- b) Explain the different methods of collection of barks.
- c) Write a brief account on Honey.
- d) Differentiate between Organized and Unorganized drugs.
- e) Add a note on Papyrus ebers, Charak samhita and Sushruta samhita.
- f) Classify the natural fibers in detail.
- g) Add a exhaustive note on Trichomes.

P.T.O.

Q3) Write a short note on (Any Three): [15]

- a) Sexual and Asexual methods of propagation of crude drugs.
- b) Define and classify Pests and pesticides in detail.
- c) Ash value and its significance.
- d) Methods for determining moisture content.

SECTION - II

Q4) Describe Agar, its method of preparation, chemical constituents, uses and chemical tests. [10]

OR

Define and explain various types of Adulteration of the crude drugs.

Q5) Answer the following (Any Five): [15]

- a) Give synonym, biological source, chemical constituents and uses of Guar gum and Accacia.
- b) Differentiate between Roots and Rhizomes.
- c) Differentiate between Gums and Mucilages.
- d) Explain the role and importance of fertilizers in production of the medicinal plants.
- e) Explain the role and importance of Auxins.
- f) Agricultural and Mechanical methods of pest control.
- g) Give biological source, chemical composition and uses of carragennan.

Q6) Write a short note on (Any Three): [15]

- a) Sources and importance of starch.
- b) Classification and uses of carbohydrates.
- c) Add a exhaustive note on Ergastic cell contents.
- d) Preliminary phytochemical screening.



Total No. of Questions : 6]

SEAT No. :

P553

[Total No. of Pages : 2

[4649] - 301
Third Year B.Pharmacy
Pharmaceutics - II
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

Q1) Explain the mechanism of wet granulation and describe any one advanced equipment used for wet granulation. **[10]**

OR

What is preformulation? What is its significance? Explain the role of partition coefficient and pH-pKa in preformulation studies.

Q2) Answer any five: **[15]**

- a) What are excipients? How are they selected? With a suitable example explain drug-excipient interactions.
- b) Write a note on parts of tablet machine.
- c) Draw a schematic diagram for the manufacturing process of hard gelatin capsule shells. Also add a note on defects in these shells.
- d) Explain disintegrants and superdisintegrants.
- e) Write a note on capping and lamination in tablets.
- f) Explain compression coating of tablets.
- g) What are stability studies? How do they differ from accelerated stability studies?

P.T.O.

Q3) Answer any three: [15]

- a) Discuss the problems encountered in film coating of tablets. Also suggest remedies to solve them.
- b) Explain various biopharmaceutical and therapeutic considerations of dosage form design.
- c) What are Heckel plots? Also explain the compression and consolidation of powder.
- d) Enlist various methods for the preparation of soft gelatin capsules. Explain the rotary die process in detail.
- e) With suitable examples discuss the importance of bulk characterization in preformulation studies.

SECTION - II

Q4) Write in detail about the formulation, manufacturing and quality of hair shampoos. [10]

OR

Write in detail about the formulation development and manufacturing of creams. Add a note on skin irritation test.

Q5) Solve any five: [15]

- a) What is the significance of semisolid bases?
- b) Explain hair dyes as cosmetic products.
- c) What is the role of colloid mill in the manufacturing of disperse systems?
- d) Discuss antioxidants as cosmeceutical agents.
- e) Discuss the quality control of eye products.
- f) Explain nail lacquers as cosmetic products.
- g) Discuss hair tonics in detail.

Q6) Write short notes on any three: [15]

- a) Formulation and quality control aspects for lipstick.
- b) Moisturizing cream.
- c) Quality control of shaving preparations.
- d) HLB.
- e) Packaging and labeling of semisolids.



Total No. of Questions : 6]

SEAT No. :

P554

[Total No. of Pages : 2

[4649] - 302

T.Y. B.Pharmacy

**3.2 : Pharmaceutical Biotechnology
(2008 Pattern)**

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *Neat diagrams must be drawn wherever necessary.*

SECTION - I

Q1) What is Recombinant DNA Technology? Describe in detailed. How Gene cloning can be perform by using various enzymes and clone vectors. [10]

OR

Explain steps involve in PCR and elaborate in detail application of PCR in Genetic Engineering techniques.

Q2) Attempt **any five**:

[15]

- a) Explain in brief plant tissue culture Media.
- b) Hairy Root culture.
- c) Explain Expression Vector.
- d) Preparation of embryo extract.
- e) Role and function of reverse transcriptase in gene cloning.
- f) Explain cDNA libraries.
- g) Application of Protoplast Culture.

P.T.O.

- Q3) Write note on any three:** [15]
- a) Gene sequencing methods.
 - b) Preparation of chicken serum.
 - c) Restriction Fragment Length Polymorphism (RFLP).
 - d) Gel electrophoresis.
 - e) DNA fingerprinting technology.

SECTION - II

- Q4) Give detail construction and working of Industrial Fermenter. Describe need and Methods of Downstream processing of Fermentation Product.** [10]

OR

Explain manufacturing and product recovery of Tetracycline.

- Q5) Attempt any five:** [15]
- a) Artificial insemination.
 - b) Immunofluorescence.
 - c) Collection, processing and storage of blood and blood product.
 - d) Production and application of Vitamin B₁₂.
 - e) Surrogate Motherhood.
 - f) Production and uses of Somatotropin.
 - g) Techniques and application involve in Immobilization of enzymes.

- Q6) Write note on any three:** [15]
- a) Human Gene Therapy.
 - b) Hybridoma technology.
 - c) Recombinant Vaccines.
 - d) Production and application of Interferons.
 - e) Fermentation discharge and Effluent treatment in fermentation process.



Total No. of Questions : 6]

SEAT No. :

P555

[Total No. of Pages : 2

[4649] - 303

Third Year. B.Pharmacy

3.3 : MEDICINAL CHEMISTRY - I

(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Correct structure/s must be drawn wherever necessary.*
- 4) *Answers to two sections shall be written in separate answer books.*

SECTION - I

Q1) Define Receptors. Enlist different types of forces involved in drug Receptor interaction and enlist types of receptors. **[10]**

OR

Discuss in details SAR of adrenergic drugs.

Q2) Solve ANY FIVE: **[15]**

- a) Write mechanism of action of Nitrovasodilators.
- b) Classify Antihyperlipidemic agents with structure of one drug from each class.
- c) Write SAR of nicotinic Ach receptor antagonists.
- d) Discuss SAR of calcium channel blockers.
- e) Classify diuretic agents and write mode of action of loop diuretics.
- f) Discuss importance of drug protein binding on action of drug.
- g) Sketch out synthetic route for Guanethedine.

P.T.O.

Q3) Write notes on ANY THREE: [15]

- a) Bioisosterism.
- b) Transduction mechanism.
- c) Diuretics and role in treatment of hypertension.
- d) Blood brain barrier and effect on drug distribution.
- e) Write SAR of Beta blockers.

SECTION - II

Q4) Solve ANY ONE: [10]

- a) Classify sedative and hypnotics. Give mechanism of action and SAR of benzodiazepine.
- b) Classify the anti depressant drugs and explain in brief about monoamine oxidase inhibitors.

Q5) Solve ANY FIVE: [15]

- a) Draw the synthesis of Haloperidol.
- b) Write in brief about Prodrug.
- c) Drugs used in Parkinsons disease.
- d) Write in brief about local anesthetics drugs.
- e) Give an account of Anti migraine agents.
- f) Discuss about oral hypoglycemic agents.
- g) Write the limitation of insulin therapy add a note on Guanithidine derivative as oral hypoglycemic agents.

Q6) Write notes on ANY THREE: [15]

- a) Outline the synthesis of phenytoin.
- b) Pschyomimetic drugs.
- c) Diagnostic agents.
- d) Alzemiers disease.
- e) Analeptics.



Total No. of Questions : 6]

SEAT No. :

P556

[Total No. of Pages : 2

[4649] - 304

Third Year B.Pharmacy

3.4 : PHARMACEUTICAL ANALYSIS - II

(2008 Pattern)

Time : 3 Hours]

[Maximum Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Answer to the two sections should be written in separate answer books.*
- 3) *Neat diagram must be drawn wherever necessary.*

SECTION - I

Q1) What is column chromatography? Explain Van Deemter equation. How it is useful in setting column conditions. **[10]**

OR

Explain half wave potential. Derive equation for half wave potential. Give its significance. Explain applications of Polarography.

Q2) Attempt any five questions from followings. **[15]**

- a) Explain principle behind electrophoresis.
- b) Give Brief history of chromatography.
- c) Explain specific and molar refraction.
- d) Give applications of HPTLC.
- e) Give applications of flurometry.
- f) Explain principle behind Flame photometry.
- g) Draw a polarogram of any titration and explain it.

Q3) Write note on Any Three : **[15]**

- a) Abbe's Refractometer
- b) DME
- c) Applications of Atomic Absorption Spectroscopy
- d) Adsorbents used in TLC

P.T.O.

SECTION - II

Q4) Explain Beers and Lamberts law for absorption. Give its derivation and explain deviations from Beers law. **[10]**

OR

What is amperometric analysis. Explain procedure, advantages and disadvantages, applications of it.

Q5) Attempt any five questions from followings : **[15]**

- a) Explain monochromators used in UV – Visible spectroscopy.
- b) Give principal behind nephelometry.
- c) Explain difference between single beam and double beam instrument with diagram.
- d) What is isothermal titration calorimetry.
- e) Give applications of Nephelometry and Turbidometry.
- f) Explain factors affecting thermogravimetric analysis.
- g) Explain different light sources used in UV Visible Spectroscopy.

Q6) Write note on Any Three : **[15]**

- a) Applications of UV Visible spectroscopy
- b) DSC
- c) Instrumentation of Nephelometry and turbidometry.
- d) Derivative spectroscopy



Total No. of Questions : 6]

SEAT No. :

P557

[Total No. of Pages : 2

[4649] - 305
Third Year B.Pharm.
3.5 : PHARMACOLOGY - II
(2008 Pattern)

Time : 3 Hours]

[Maximum Marks : 80

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *Neat labeled diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

SECTION - I

Q1) Classify the cholinergic drugs. Discuss mechanism of action, pharmacological actions, therapeutic uses, and adverse drug reactions of physostigmine. [10]

OR

Classify antidepressant drugs. Discuss mechanism of action, pharmacological actions, therapeutic uses, and adverse drug reactions of fluoxetine.

Q2) Answer the following (Any 5) [15]

- a) Explain why levodopa is combined with carbidopa.
- b) What do you mean by redistribution of barbiturates?
- c) Write the therapeutic uses of atropine.
- d) Write the biosynthesis pathway of adrenaline.
- e) What is 'biphasic' response of adrenaline?
- f) Explain the various mechanisms by which general anesthetics acts.
- g) Classify NSAIDs.

Q3) Write short note on (Any 3) [15]

- a) Neuromuscular blocking agents
- b) Barbiturate poisoning
- c) Nootropics
- d) Principle of rehabilitation of drug addicts
- e) β -blockers

P.T.O.

SECTION - II

Q4) Classify oral hypoglycemic agents. Discuss mechanism of action, metabolic effects, and adverse drug reactions of metformin. **[10]**

OR

Classify drugs for peptic ulcers. Discuss the pharmacotherapy of *H. pylori*.

Q5) Answer the following (Any 5) **[15]**

- a) Classify expectorants and antitussives.
- b) Classify drugs for constipation.
- c) Explain the mechanism of action of oxytocin.
- d) Write the therapeutic uses of antithyroid drugs.
- e) Describe the physiological effects of glucagon.
- f) Write the therapeutic uses of corticosteroid antagonists.
- g) Explain the mechanism of action of salbutamol.

Q6) Write short note on (Any 3) **[15]**

- a) Rheumatoid arthritis
- b) Oral contraceptives
- c) Antiemetics
- d) Drugs regulating calcium homeostasis
- e) Local Anesthetics



Total No. of Questions : 6]

SEAT No. :

P558

[Total No. of Pages : 2

[4649] - 306
Third Year B. Pharmacy
3.6 : PHARMACOGNOSY - II
(2008 Pattern)

Time : 3 Hours]

[Maximum Marks : 80

Instructions to the candidates:

- 1) Answers to the two sections should be written in separate books.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*
- 4) All questions are compulsory.*

SECTION - I

Q1) Solve any one :

Explain in detail the chemistry of saponins. Give detail pharmacognostic account of Yam. **[10]**

OR

Explain in detail classification, chemistry and general methods of extraction of volatils oils with examples.

Q2) Solve any five :

[15]

- a) Explain stas - otto method of isolation for glycosides.
- b) Give Biological source, chemical constituents and uses of Lavender.
- c) Differentiate between Cardenolide and Bufadienolide with suitable examples.
- d) What is 'Virgin Olive Oil'? Give chemical constituents & chemical test for its identification.
- e) Draw a well labeled diagram of T.S. of Bhui - nimb.
- f) Give Biological source, chemical constituents and Adulterants of clove.
- g) Give Biological source, chemical constituents and identification test for shark liver oil.

P.T.O.

Q3) Write notes on (Any Three) : **[15]**

- a) Applications of Tracer Techniques.
- b) Cynogenetic glycosides.
- c) Cardamom
- d) Cocoa butter
- e) Bavchi

SECTION - II

Q4) Solve any one : **[10]**

Explain in detail various techniques and importance of Genetic manipulation in plant tissue culture.

OR

“Resins are chemically not pure substances but are complex mixtures of several resinous substances”. Justify this statement with detail account of resinous substances present in resins along with various uses of resins.

Q5) Solve any five : **[15]**

- a) Give general method of extraction of tannins.
- b) Explain the chemical tests used to differentiate between Kattha and Gambier.
- c) Give Biological source, chemical constituents and adulterants of Arjuna along with the chemical test used to determine adulteration.
- d) Give Biological source, chemical constituents and chemical tests for Indian goose berry.
- e) “Colophony should be stored in unground condition” Justify the statement and give the chemical test for identification of colophony.
- f) Differentiate between Sumatra Benzoin and Siam Benzoin.
- g) Explain method of preparation, chemical constituents and identification test for podophyllum resin.

Q6) Write notes on (Any Three) **[15]**

- a) Conservation of Endangered species through micropropagation.
- b) Tobacco as a plant pesticide.
- c) Serratiopeptidase.
- d) Fullers earth.
- e) Droplet counter current extraction.



Total No. of Questions : 6]

SEAT No. :

P561

[Total No. of Pages : 2

[4649] - 402

Final Year B.Pharmacy

BIOPHARMACEUTICS AND PHARMACOKINETICS

(2008 Pattern)

Time : 3 Hours]

[Maximum Marks : 80

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right in bold indicate full marks.*

SECTION - I

Q1) Answer any 1 out of 2. **[10]**

- a) Discuss the assumptions, limitations and significance of pH partition hypothesis.
- b) Discuss various physiological factors affecting drug absorption.

Q2) Answer any 5 out of 7 **[15]**

- a) Why phase II reactions are called as true detoxication reactions?
- b) Explain various physicochemical factors governing drug excretion
- c) Compare single dose versus multiple dose bioavailability studies.
- d) Enlist factors influencing protein binding of drugs.
- e) Give the reasons for higher solubility and better dissolution of salt form of drug.
- f) Give different methods to study biotransformation.
- g) What are various approaches used to enhance bioavailability of drug from its dosage form.

Q3) Answer any 3 out of 5 **[15]**

Write short notes on :

- a) Bioactivation
- b) Volume of distribution and its importance
- c) Prodrug
- d) First pass effect
- e) Kinetics of protein binding

P.T.O.

SECTION - II

Q4) Answer any 1 out of 2 **[10]**

- a) Explain in detail various methods to estimate absorption rate constant for orally administered drug following one compartment model.
- b) Explain with example concept of individualization of dose in renal and hepatic diseases.

Q5) Answer any 5 out of 7 **[15]**

- a) State the advantages of administering drug by constant i.v. infusion over oral administration.
- b) Define and explain in short MRT, AUC and total body clearance.
- c) Compare compartmental modeling with non compartmental modeling.
- d) Name the two parameters that are generally adjusted in developing dosage regimen.
- e) Give significance of therapeutic drug monitoring.
- f) Enlist various objectives of IVIVC.
- g) Give BCS classification of drugs

Q6) Answer any 3 out of 5 **[15]**

Write short notes on :

- a) Dissolution models
- b) Dose dependent kinetics
- c) Theories of dissolution.
- d) Plasma concentration time curve
- e) Urine excretion method.



Total No. of Questions : 6]

SEAT No. :

P562

[Total No. of Pages : 2

[4649] - 403
Final Year B.Pharmacy
MEDICINAL CHEMISTRY - II
(2008 Pattern)

Time : 3 Hours]

[Maximum Marks : 80

Instructions to the candidates:

- 1) All questions are compulsory.*
- 2) Answers to the two sections should be written on the separate answer books.*
- 3) Draw diagram whenever necessary.*
- 4) Figures to the right indicate full marks.*

SECTION - I

Q1) Write structure, chemical name, mode of action and synthesis of [10]

- a) Mebendazole
- b) Ethambutol

OR

What is PKa value? Write role of PKa in design of antibacterial sulphonamides. Highlight minimum structural requirements of sulphonamides to show maximum antibacterial activity with suitable examples. [10]

Q2) Solve any Five : [15]

- a) Give focus on Hansch analysis.
- b) Write Chemotherapy of amoebiasis
- c) Write route of synthesis of ciprofloxacin.
- d) Give chemical classification of antifungal agents with example.
- e) Explain rifampicin as anti-tubercular agents.
- f) Write about DHFR inhibitors as chemotherapeutic agents.

P.T.O.

Q3) Solve Any Three : [15]

- Classify antiviral agents with suitable example. Give detail account of pyrimidine analogues as antivirals.
- Classify antineoplastic agents with suitable example. Describe mode of action and SAR of alkylating agents.
- Give focus on targets available for development of antimalarials on the basis of life cycle of *Plasmodium falciparum* with suitable examples.
- Describe 14 α - demethylase inhibitors as antifungal agents.

SECTION - II

Q4) Write phenam and cepham ring system with their chemical name. Discuss chemistry and SAR of antibiotics containing cepham ring system. [10]

OR

What are antihistaminics? Classify H₁ receptor blockers with suitable example. Give focus on structural requirements for H₁ receptor blockers. [10]

Q5) Solve Any Five : [15]

- Search route for synthesis of ranitidine.
- Write about pka values of tetracycline.
- Comment on enzyme penicillinase inhibitors.
- Write about non-sedative antihistaminics.
- Write chemistry of polypeptide antibiotics.
- Highlight steroidal anti-inflammatory agents.

Q6) Solve Any Three [15]

- Write chemistry, SAR and mode of action of antibiotic having nitroaromatic ring system with propandiol side chain.
- Discuss structural features of opioid receptors and write about development of opioid antagonists.
- Describe chemistry, SAR and mode of action aminoglycoside antibiotics.
- Write a note on antifertility agents.



Total No. of Questions : 8]

SEAT No. :

P563

[Total No. of Pages : 2

[4649] - 404
Final Year B.Pharmacy
PHARMACEUTICAL ANALYSIS - III
(2008 Pattern)

Time : 3 Hours]

[Maximum Marks : 80

Instructions to the candidates:

- 1) *Write answer to Section - I and Section - II in separate book.*
- 2) *Q.No. 1 and Q.No.5 are compulsory.*
- 3) *Write Two questions from Section - I and Two questions from Section - II from the remaining.*

SECTION - I

Q1) Answer any five of the following Two marks each.

- a) Predict the number of NMR signals shown by the following compounds
 - i) 1, 2 - dichloropropane
 - ii) Trans - 1, 2 - dimethyl cyclopropane
 - iii) Allyl bromide
 - iv) Acetone
- b) Why ^{12}C , ^{16}O , ^{18}O , and ^{32}S do not show NMR spectra
- c) In GC, how the flow rate of carrier gas is controlled and measured? How the soap - bubble flow meter works?
- d) How will you distinguish the type of Hydrogen bonding by IR spectroscopy.
- e) What is full name of following columns used in Gas chromatography?
- f) What is an ortho effect in mass spectrometry? Explain with example.

Q2) a) Discuss the types of IR transducers. **[8]**

b) Explain the principle of the capillary Zone electrophoresis. **[7]**

P.T.O.

- Q3)** a) Explain in brief Trouble shooting and degassing techniques in HPLC [8]
b) Explain the basic principle of IR spectroscopy. [7]

- Q4)** Write note on any Three [15]
a) Factors affecting chemical shift
b) Polymorphism
c) HETP
d) Van Dee meter equation

SECTION - II

- Q5)** a) How will you differentiate Salicylic acid and m - Hydroxy benzoic acid by IR spectra. [5]
b) Why P^H affects the separation of amino acids by electrophoresis? Explain. [5]

- Q6)** a) Explain the Mc Lafferty rearrangement for aliphatic ester. [8]
b) Write the principle and instrumentation of Mass spectrometer. [7]

- Q7)** a) Explain Validation of analytical method as per ICH guidelines. [8]
b) Explain the theory of Nuclear Magnetic resonance spectroscopy. [7]

- Q8)** Write note on any Three [15]
a) HID calculations
b) Columns used in Gas chromatography
c) Supercritical fluid extraction
d) Coupling constants.



Total No. of Questions : 6]

SEAT No. :

P564

[Total No. of Pages : 2

[4649] - 405
Final Year B.Pharmacy
PHARMACOLOGY - III
(2008 Pattern)

Time : 3 Hours]

[Maximum Marks : 80

Instructions to the candidates:

- 1) Answer to the two sections should be written in separate books.*
- 2) Figures to the right indicate full marks.*
- 3) All questions are compulsory.*

SECTION - I

Q1) Define Angina pectoris. Discuss the mode of action, pharmacological actions, therapeutic uses and adverse effects of nitrates. **[10]**

OR

Classify antihypertensive drugs. Explain in detail angiotensin converting enzyme inhibitors with respect to mode of action, therapeutic uses and adverse effects.

Q2) Solve **any five** **[15]**

- a) Describe the treatment of cyanide poisoning.
- b) Discuss in brief mechanism and adverse effects of tetracycline.
- c) Explain the treatment of chronic lead poisoning.
- d) Give a brief account on fluroquinolones.
- e) Justify use of calcium channel blockers in heart failure.
- f) Describe the mode of action and adverse effects of thiazide diuretics.
- g) Classify semisynthetic penicillins. Discuss the therapeutic utility of amoxycillin.

P.T.O.

Q3) Write short notes on any three [15]

- a) Antileprotic drugs
- b) Co - trimoxazole
- c) Gastric lavage
- d) Antimetabolites
- e) Digitalis glycosides

SECTION - II

Q4) Classify drug interaction. Explain in brief the drug interaction during drug metabolism and excretion with suitable examples. [10]

OR

Explain the types of clinical trials. Discuss the composition, responsibilities and functions of Institutional Review Board.

Q5) Solve any five [15]

- a) Define inpatient. Write the advantages of Inpatient care.
- b) Explain the advantages of unit dosage form.
- c) Write the stages of patient counselling.
- d) Explain the types of hypersensitivity reactions.
- e) Write the role of hospital pharmacist in patient care.
- f) Explain the importance of patient medication profile.
- g) Functions of pharmacy and therapeutic committee.

Q6) Write short notes on any three [15]

- a) The Nuremberg code.
- b) Contract Research Organization (CRO)
- c) Complete floor stock system.
- d) Phases of clinical research.
- e) Pharmacodynamic drug interaction.



Total No. of Questions : 6]

SEAT No. :

P565

[Total No. of Pages : 2

[4649] - 406
Final Year B.Pharmacy
4.6 : PHARMACOGNOSY - III
(2008 Pattern)

Time : 3 Hours]

[Maximum Marks : 80

Instructions to the candidates:

- 1) All questions are compulsory.*
- 2) Answers to the two sections should be written in separate answer books.*
- 3) Neat diagrams must be drawn wherever necessary.*
- 4) Figures to the right indicate full marks.*

SECTION - I

Q1) Solve any one :

[10]

Describe the ring system and give classification of flavonoids with examples.
Write short note on Gingko.

OR

Define & write classification of alkaloids. Explain life cycle of Ergot.

Q2) Solve any five :

[15]

- a) Explain flavones with example.
- b) Write systematic pharmacognostic study of Rauwolfia.
- c) Explain marine toxins.
- d) Write chemical tests for Datura and Nux-vomica.
- e) Explain in short Pipali and Nagarmotha.
- f) Explain cultivation and collection of Ephedra.
- g) Explain general biosynthetic pathway for Tropane alkaloids.

P.T.O.

Q3) Write notes on any three : [15]

- a) Gulvel and Shankhpushpi
- b) Chalcones
- c) Isoquonoline alkaloids
- d) Allergenic extracts

SECTION - II

Q4) Solve any one : [10]

Explain principles of Ayurveda. Enlist different dosage forms and write difference between Asava and Arishta.

OR

Enlist different parameters recommended by WHO for Q.C. of herbal drugs. Elaborate on pesticide residue and ash value.

Q5) Solve any five: [15]

- a) Describe structural elucidation of Atropine.
- b) Explain herbal hair care products.
- c) Explain extraction and isolation of Eugenol.
- d) Discuss the regulatory requirement for infrastructure in herbal drug industry.
- e) Define herbal drug interaction. Explain toxicity and interaction of Cinchona.
- f) Give applications of chromatographic techniques in evaluation of herbal drugs.
- g) Explain extraction of Caffeine and its TLC.

Q6) Write a note on any three. [15]

- a) Digitalis toxicity
- b) Bhasma
- c) Plant based industries
- d) Export of herbal products

