

Total No. of Questions : 6]

SEAT No. :

**P2971**

[Total No. of Pages : 2

**[5452]-101**

**F.Y.B. (Pharmacy)**

**1.1.1T PHARMACEUTICS - I**

**(2013 Pattern) (Semester - I)**

*Time :3 Hours]*

*[Max. Marks : 70*

*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) Attempt any one** **[10]**

- a) Define Excipients, how excipients are classified? Add a note on preservatives and colors used in pharmaceuticals.

OR

- b) Discuss the classification of dosage form and add a note on different routes of drug administration.

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

- a) What are the career opportunities after pharmacy graduation?
- b) Explain the different flavours used in pharmaceuticals.
- c) Write the scope of Pharmaceutical Engineering.
- d) Describe ayurvedic system of medicine.
- e) What is pharmacopoeia? Add a note on U.S.P.
- f) Write the principles of Homoeopathy as alternative system of medicine.
- g) What are the different branches of pharmaceuticals?

**Q3) Write short notes (any two)** **[10]**

- a) Indian Pharmacopoeia.
- b) Pharmacy code of ethics.
- c) Scope of Hospital Pharmacy.
- d) Principle of Siddha and Unani.

**P.T.O.**

## SECTION - II

**Q4)** Attempt any one

- a) Differentiate between Quality control and Quality Assurance, Explain cGMP requirement for pharmaceuticals. [10]

OR

- b) Discuss in detail formulation aspect of Pharmaceutical solutions.

**Q5)** Attempt any five

[15]

- a) Write the composition of any one mouth wash preparation.  
b) Explain any one method for preparation of Aromatic water.  
c) Discuss formulation of simple linctus and give direction for its administration.  
d) Explain mechanism of solubilization of dill oil in Concentrated Dill Water I.P.  
e) What are elixirs? Write the formulation ingredients used in any one elixir preparation.  
f) Why excessive heating of glycerin is avoided during preparation of paints?  
g) Why preservatives are not added in Simple Syrup I.P.

**Q6)** Write short notes (any two)

[10]

- a) Solvents used in pharmaceutical solutions.  
b) Enema  
c) Medicated syrups  
d) Sweeteners in pharmaceuticals.



Total No. of Questions : 6]

SEAT No. :

**P2972**

[5452]-102

[Total No. of Pages : 2

**F. Y. B. Pharm.**

**MODERN DISPENSING PRACTICES**

**(2013 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*
- 4) *Use of calculator is allowed.*

**SECTION - I**

**Q1) Answer any one. [10]**

- a) Define prescription. Explain in detail responding to prescription.
- b) Explain good compounding and dispensing practice.

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

- a) What would be the dose for child of 6 and 10 years; if the adult dose is 250 mg.
- b) Explain in brief Patient Medication Record.
- c) Describe in brief stability of medicine.
- d) Explain documentation of prescription filling.
- e) Describe containers for dispensed products.
- f) Explain proof spirit; calculate proof strength for 95% v/v alcohol.
- g) In what proportion should be 45% and 15% alcohol be mixed to make 1000 ml of 30% alcohol.

**Q3) Write short note on (any two) [10]**

- a) Give in detail documentation of purchase and stock record.
- b) Factors affecting dose calculation.
- c) Pricing of prescription.
- d) Labeling of dispensed product.

**P.T.O.**

## SECTION - II

**Q4)** Answer any one. **[10]**

- a) Define Incompatibility. Describe in brief various types of incompatibility.
- b) Explain patient counseling for prescription drugs, OTC and cosmetic products.

**Q5)** Answer any five. **[15]**

- a) Give the structure and design of retail drug store.
- b) Explain legal requirements for establishment and maintenance of retail drug store.
- c) Explain reporting of idiosyncratic cases.
- d) Explain in brief role of pharmacist in family planning.
- e) Describe incompatibility due to dispensing errors.
- f) Explain in brief Rational drug use.
- g) Explain patient counseling in Asthma.

**Q6)** Write a short note on (any two) **[10]**

- a) Role of pharmacist in adverse drug reactions
- b) Pharmacovigilance
- c) Role of pharmacist in community healthcare and education.
- d) Drug Information service



Total No. of Questions : 6]

SEAT No. :

**P2973**

[5452]-103

[Total No. of Pages : 2

**First Year B. Pharmacy**

**1.1.3 T : PHARMACEUTICAL INORGANIC CHEMISTRY**

**(2013 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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)** Attempt any ONE of the following. **[10]**

- a) What is Hardness of Water? Discuss various methods to remove hardness of water.
- b) Define limit test. Give the principles involved in following limit tests
  - i) Limit test of Iron
  - ii) Limit test for Sulphate
  - iii) Limit test for Chloride

**Q2)** Solve any FIVE of the following. **[15]**

- a) Define
  - i) Pharmacopoeia
  - ii) Monograph
  - iii) Achlorhydria.
- b) Discuss the role of Sodium, phosphate and bicarbonate ions in our body.
- c) Write a note on saline cathartics.
- d) Enlist the contents of individual monograph. Discuss solubility parameters as per I.P.
- e) Explain kaolin and pectin as GIT protective adsorbents.
- f) Give composition and role of ORS.
- g) Give the principle involved in limit test for heavy metals as per I.P.

**P.T.O.**

- Q3)** Solve any TWO of the following **[10]**
- a) Write a note on electrolytes used in replacement therapy.
  - b) Describe various official waters.
  - c) Write a note on sources of impurities in pharmaceuticals.
  - d) What are antacids? Discuss any two aluminium containing antacids.

**SECTION - II**

- Q4)** Attempt any ONE of the following. **[10]**
- a) Give the biological role of Iron and Iodine. Give preparation, properties, uses and storage of
    - i) Ferrous sulphate
    - ii) Copper sulphate
    - iii) Zinc sulphate
  - b) What are topical agents? Explain mechanism of action of Antimicrobial agents. Discuss Preparation, Properties, assay and uses of Boric acid.

- Q5)** Solve any FIVE of the following- **[15]**
- a) What are anticaries agents? Give role of fluorides as anticaries agents.
  - b) Give preparation, properties and uses of Zinc oxide.
  - c) Give preparation, properties and uses of Potassium permanganate.
  - d) Give the biological role of copper element in our body.
  - e) Write a note on inorganic antidepressant agents.
  - f) Define along with examples
    - i) Expectorants
    - ii) Astringents
    - iii) Cytotoxic agents.
  - g) Give the biological role of Oxygen and carbon dioxide.

- Q6)** Solve any TWO of the following. **[10]**
- a) Write a note on dentifrices.
  - b) Write a note on Radio opaque Contrast Media.
  - c) What are antidotes? Classify them with examples and give properties and uses of sodium thiosulphate.
  - d) Give the biological role of oxygen. Write storage and labeling conditions for Nitrogen, Nitrous oxide and Oxygen as inorganic gases.



Total No. of Questions : 6]

SEAT No. :

P2974

[5452]-104

[Total No. of Pages : 3

F.Y. B. Pharm.

PHARMACEUTICAL ORGANIC CHEMISTRY - I

(2013 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

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 side indicate full marks.
- 4) Neat diagrams must be drawn wherever necessary.

**SECTION - I**

**Q1)** a) Explain with mechanism addition of hydrogen halide to Alkenes and Oxymercuration-Demercuration reaction in alkenes. [10]

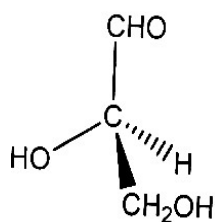
OR

b) Define elimination reactions and explain in detail mechanism, stereochemistry and factors affecting rate of E2 reactions. [10]

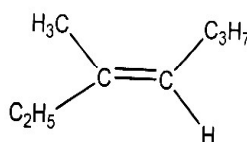
**Q2)** Answer the following (Any five) [15]

a) Assign R/S or E/Z configuration to following

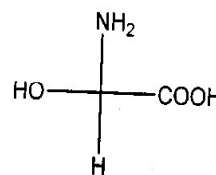
i)



ii)

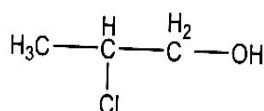


iii)

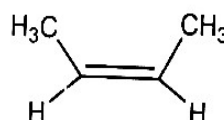


b) Write IUPAC names for following structures

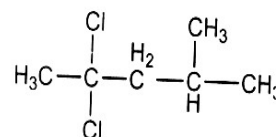
i)



ii)



iii)



P.T.O.

- c) Write short note on Ozonolysis reaction in alkenes.
- d) Define following terms with suitable examples
  - i) Nucleophile                      ii) Carbanion                      iii) Electrophile
- e) Ethylamine is more basic than ammonia. Give reason.
- f) Explain Tautomerism with example.
- g) Draw resonating structures of following.
  - i) Benzaldehyde                      ii) Nitrobenzene

**Q3) Answer the following (Any Two) [10]**

- a) What are aromatic electrophilic substitution reactions. Write mechanism of Nitration of Benzene.
- b) Define hybridization. Explain formation of methane molecule through concept of hybridization.
- c) Classify organic compounds on the basis of elemental composition (at least five classes with suitable examples).
- d) Compare E1 and E2 elimination reactions.

### SECTION - II

**Q4) a) Define isomerism? Explain structural and geometrical isomers with examples. [10]**

OR

b) Explain types of chemical reactions with suitable examples. [10]

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

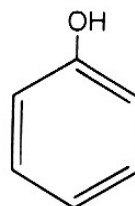
- a) Arrange following in order of increasing acidity with explanation
  - i) Acetic acid
  - ii) Trichloroacetic acid
  - iii) Chloroacetic acid
- b) Explain saytzeff rule for 1,2 elimination reaction ?
- c) Discuss any two factors affecting E1 reaction mechanism.
- d) Explain Mechanism of E<sub>1</sub>CB reaction.
- e) Explain why phenol is less acidic than acetic acid.
- f) Draw structures from IUPAC names of following :
  - i) 4-nitro phenol
  - ii) 2-chloropropanoic acid
  - iii) 2-pentanone

g) Apply Huckel's rule of aromaticity and differentiate following compounds into aromatic and non-aromatic or anti-aromatic compound.

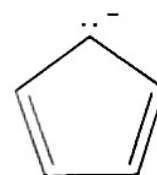
i)



ii)



iii)



**Q6)** Answer the following (Any Two)

**[10]**

- Explain inter and Intra molecular forces of attraction
- What are alkynes ? Write their any two methods of preparation and two reactions.
- State and Explain markovnikov and Anti markonikov rule.
- Amino group is ortho-para director ? Explain.



Total No. of Questions :6]

SEAT No. :

**P2975**

**[5452]-105**

[Total No. of Pages : 2

**F. Y. B. Pharmacy**

**1.1.5. HUMAN ANATOMY AND PHYSIOLOGY - I  
(2013 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answer 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 leukocytes. Explain in detail formations & structure of each type.  
Add note on functions of leukocytes. **[10]**

OR

Explain 'Fluid Mosaic Model' of plasma membrane with the help of neat labeled diagram. Discuss the structure and function of membrane proteins.

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

- a) Explain the transport across plasma membrane by endocytosis.
- b) Describe the structure and functions of endoplasmic reticulum.
- c) Add an account on RBCs.
- d) Define the blood clotting. Enlist clotting factors.
- e) Define the terms: Homeostasis, Hematopoiesis & Hemostasis.
- f) Explain structure of smooth muscle.
- g) Discuss the negative feedback system with example.

**Q3)** Write short notes on (Any 2) : **[10]**

- a) Physiology of muscle contraction
- b) ABO & Rh blood Groups
- c) Cell division
- d) Epithelial tissues

**P.T.O.**

## SECTION - II

**Q4)** With well labeled diagram explain the different parts of Electrocardiogram. Discuss in detail the diagnostic importance of ECG. **[10]**

OR

With neat labeled diagram describe gross anatomy of heart. Discuss hormonal regulation of blood pressure.

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

- a) Discuss the anatomy and functions of liver.
- b) Define the terms : Arteriosclerosis, Congestive Heart Failure & Hypertension.
- c) Give composition , formation & circulation of lymph.
- d) Add a note on salivary glands.
- e) Write the locations and functions of Heart valves.
- f) Explain the structure & functions of lymph nodes.
- g) Explain the terms : Cardiac output & Stroke volume.

**Q6)** Write short note on (Any 2) : **[10]**

- a) Stomach : Anatomy, Histology & functions
- b) Cardiac cycle
- c) Conduction system of heart
- d) Spleen



Total No. of Questions :6]

SEAT No. :

**P2976**

**[5452]-106**

[Total No. of Pages : 2

**First Year B. Pharmacy**

**116 : COMMUNICATION AND SOFT SKILL DEVELOPMENT  
(2013 Pattern) (Semester-I)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answer 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)** Explain various parts of business letters. Explain the purpose and qualities of business correspondence. **[10]**

OR

Write meaning and importance of communication. Explain objectives of communication. Describe the different modes of overcoming barriers of communication. **[10]**

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

- a) State objectives of business letters.
- b) Explain the importance of oral communication.
- c) State the principles of thinking about purpose.
- d) Explain the importance of knowing audience.
- e) Explain salient features of technical communication.
- f) Write importance of structuring the message.
- g) Explain Scope & Significance of technical communication.

**Q3)** Write short note on (Any 2): **[10]**

- a) Body Language
- b) Graphic Language
- c) Official letters
- d) Punctuation and spelling

***P.T.O.***

## SECTION - II

**Q4)** Define business communication. Write principles and essentials of good correspondence. Explain different types of commercial correspondence.[10]

OR

What is globalization? State the advantages and disadvantages of globalization. Add a note on Email.

**Q5)** Answer the following (Any 4) : **[15]**

- a) Explain various Intrapersonal skills.
- b) Explain importance of group discussion.
- c) Write an account on emotional intelligence.
- d) Describe Intonation and rhythms.
- e) Explain importance of tele communication.
- f) What is empathy. Discuss its types.
- g) Explain Vowels and Consonants in phonetics.

**Q6)** Write short note on (Any 2) : **[10]**

- a) Agenda
- b) Resume
- c) Business correspondence
- d) Critical thinking



Total No. of Questions : 6]

SEAT No. :

**P2977**

[Total No. of Pages : 2

**[5452]-107**

**F.Y. B. Pharmacy**

**1-7 : COMPUTER APPLICATIONS AND BIostatISTICS**

**(2008 Pattern) (Semester - I)**

*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) a)** Define sample and population in statistics explain with example. [5]

b) Calculate coefficient of variation for the data given below - 13, 35, 56, 35, 77. [5]

OR

Calculate mean & median for the following data. [5]

Class-limits	0 -30	30 - 60	60 -90	90 -120	120 -150	150 -180
Frequency	8	13	22	27	18	7

**Q2) a)** In a box there are 5 Aspirin, 6 Analgin and 10 Paracetamol tablets. If one tablet is chosen at random find the probability that? [5]

- i) It is Aspirin.
- ii) It is not paracetamol.

b) Compute correlation coefficient between supply and price of commodity using following data. [10]

Supply	152	158	169	182	160	166	182
Price	198	178	167	152	180	170	162

**P.T.O.**

- Q3)** a) For a certain X and Y series which are co-related, the two lines of regression are  $5x - 6y + 90 = 0$  and  $15x - 8y - 130 = 0$  find which is that of Y on X and which is that of X on Y. Also find means and the coefficient of correlation. [5]
- b) Explain simple random sampling with two methods of selecting a sample. [5]
- c) A random variable X has the following probability distribution: [5]

X	0	1	2	3	4	5	6
P(x)	k	3k	5k	7k	9k	11k	13k

find: i) K      ii)  $p(x \geq 2)$       iii)  $p(0 < x < 5)$

### SECTION - II

- Q4)** a) What are input Devices. Explain any two input devices. [5]
- b) State and explain any two types of primary storage device. [5]
- c) Explain any two types of data processing systems. [5]

- Q5)** a) What are optical storage devices? Explain. [5]
- b) State and explain various types of data types used in multimedia. [5]

OR

What is GUI? Explain any four GUI components used in Microsoft Windows.

- Q6)** a) State and explain use of word processor in our day to day life. [5]

OR

State any two features of word Processor

- b) State and explain with examples Built in functions used in MS-Excel. [5]
- c) Write short note on MS Power point. [5]

OR

Write short note on MS Outlook.



Total No. of Questions : 6]

SEAT No. :

**P2978**

[Total No. of Pages :2

**[5452] - 201**

**F.Y. B. Pharmacy**

**1.2.1 - (T) : PHARMACEUTICS-II**

**(2013 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks :70*

*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)** Give advantages, disadvantages, types of glass as pharmaceutical packaging material. What is water attack test for glass? **[10]**

OR

Discuss factors affecting rate of filtration. Write construction and working of rotary filter.

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

- a) Describe the construction and working of fluid energy mill.
- b) Discuss the role of packaging in pharmaceutical products.
- c) What is the importance of size separation?
- d) What is filter aid and what are its ideal characteristics?
- e) Draw neat and well labeled diagram of Filter press.
- f) Describe various filter media.
- g) Write on elutriation.

**Q3)** Write short note on (Any 2) **[10]**

- a) Colloidal mill.
- b) Microscopy as a method of determination of particle size distribution.
- c) Blister packing of unit dosage forms.
- d) Hydro extractors.

***P.T.O.***

## SECTION - II

**Q4)** Enumerate and describe the mixers for mixing of liquids. Add a note on baffles. **[10]**

OR

Draw and explain general layout of pharmaceutical manufacturing plant.

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

- a) Write on Phase II metabolism.
- b) Discuss in brief AUC and minimum effective concentration.
- c) Describe mechanisms of powder mixing.
- d) Write on active absorption.
- e) What is first pass effect?
- f) Write on non renal routes of excretion.
- g) Write on liquid manufacturing vessel.

**Q6)** Write short note on (Any 2). **[10]**

- a) Prevention of foam and aeration.
- b) Powder Mixers-Enlist and describe any one.
- c) Renal excretion.
- d) Current Good Manufacturing Practices.



Total No. of Questions : 6]

SEAT No. :

**P2979**

**[5452]-202**

[Total No. of Pages : 2

**First Year B. Pharmacy**  
**1.2.1. : DOSAGE FORM DESIGN**  
**(2013 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks :70*

*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)** Give detail account of various components of suspension. Also explain how to evaluate suspension. **[10]**

OR

Explain theories of emulsion and formulation aspects of emulsion.

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

- a) Write a note on methods of mixing.
- b) Hydrophilic Lipophilic Balance.
- c) Explain the importance of densities in evaluating powders.
- d) Explain methods of granulation.
- e) Self-emulsifying drug delivery.
- f) Write a note on precipitate forming liquid.
- g) Evaluation of emulsion.

**Q3)** Write short note on (Any 2): **[10]**

- a) Write a note on novel drug delivery system.
- b) Explain formulation aspects of talcum powder.
- c) Write a note on different conventional dosage forms.
- d) Explain dry suspension.

**P.T.O.**

## SECTION-II

**Q4)** Explain different factors affecting rate of solubility and dissolution of drugs. [10]

OR

Define and classify dosage forms along with advantages and disadvantages of each.

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

- a) Formulation aspects of Creams.
- b) Explain along with examples different ointment bases.
- c) Explain gelling agents.
- d) Add a note on displacement value.
- e) Explain solubility and dissolution.
- f) Add a note on Ointment bases along with examples.
- g) Suppository bases.

**Q6)** Write short note on (Any 2): [10]

- a) Write a note on paste.
- b) Explain radioactivity and unit of radioactivity.
- c) Explain different types of suppository.
- d) Factors affecting solubility.



Total No. of Questions : 6]

SEAT No. :

**P2980**

[5452]-203

[Total No. of Pages : 2

**F.Y. B. Pharmacy**

**PHARMACEUTICAL ORGANIC CHEMISTRY - II**

**(2013 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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)** What are sulphonic acid? Explain their acidic nature. Explain any three methods and three reactions of sulphonic acid. **[10]**

OR

What are condensation reactions? Explain mechanism of Aldol condensation.

**Q2)** Answer the following (any five) : **[15]**

- a) Draw structures from IUPAC names of following :
  - i) 2-hydroxycyclopentanone
  - ii) 2,4,6-tribromo phenol
  - iii) 4-bromo phenol
- b) Explain the preparation and uses of diazonium salts.
- c) How will you differentiate between phenol and ethanol.
- d) What are enamines? Explain the preparations of enamines.
- e) Discuss any three methods of preparation of alcohols.
- f) Explain Williamson's ether synthesis.
- g) Explain phenols are weak acid in nature.

**Q3)** Write short solve note on (any two) **[10]**

- a) Cannizaro reaction
- b) Haloform reaction
- c) Perkin reaction
- d) Two methods of preparation of aldehyde with reaction mechanism

**P.T.O.**

## SECTION - II

**Q4)** Explain the substitution Nucleophilic unimolecular reaction with mechanism, stereochemistry and factors affecting giving suitable examples. [10]

OR

Define and classify functional derivatives of carboxylic acids with any two structures from each class. Give any two methods of preparation and reactions of esters.

**Q5)** Answer the following (Any five) : [15]

- a) Give any two reactions of amides.
- b) Give any two methods of preparation of anhydrides.
- c) Distinguish between cyanides and isocyanides.
- d) Explain any two reactions of acid chlorides.
- e) Write any two methods of preparation of alkyl halide.
- f) Discuss Dehydrohalogenation reaction.
- g) Explain any two reactions of isocyanides.

**Q6)** Write short notes on (Any Two) : [10]

- a) Compare substitution vs elimination reaction.
- b) Claisen's reaction.
- c) Substitution nucleophilic internal reaction.
- d) Dicarboxylic acids.



Total No. of Questions : 6]

SEAT No. :

**P2981**

[Total No. of Pages :2

**[5452] - 204**

**F.Y. B. Pharmacy**

**HUMAN ANATOMY & PHYSIOLOGY - II**

**(2013 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Classify Nervous system. Explain in detail the anatomy of Sympathetic and Parasympathetic nervous system? **[10]**

OR

Draw a neat labeled diagram of Human Eye. Explain in detail the Physiology of Vision?

**Q2)** Answer the following (any five) **[15]**

- a) Define the following terms.
  - i) Neurology
  - ii) Pulmonary ventilation
  - iii) Vital capacity
- b) Explain the structure of cerebellum.
- c) Explain physiology of Hearing.
- d) Explain the functions of CSF.
- e) Explain thermoregulation.
- f) Draw a neat labeled diagram of Respiratory system.
- g) Explain the meninges of CNS.

***P.T.O.***

- Q3)** Write notes on (any two) [10]
- a) Cranial Nerves.
  - b) Reflex Arc.
  - c) Cerebrum.
  - d) Limbic system.

**SECTION - II**

- Q4)** Draw a neat labeled diagram of nephron and explain detailed physiology of urine formation. [10]

OR

Discuss female reproductive cycle and hormones involved in it.

- Q5)** Answer the following (any five) [15]
- a) Define the following terms.
    - i) Urology
    - ii) Nephrology
    - iii) Endocrinology
    - iv) Renal failure
    - v) Endometriosis.
  - b) Explain the structure of sperm.
  - c) Explain physiology of micturition.
  - d) Explain the functions of kidney
  - e) Explain oogenesis.
  - f) Draw a neat labeled diagram of male reproductive system.
  - g) Explain physiological actions of thyroid gland.

- Q6)** Write notes on (any two) [10]
- a) Regulation of electrolyte balance by kidneys.
  - b) Regulation of glucagon and insulin secretion.
  - c) Anti diuretic hormone.
  - d) Menstrual cycle.



Total No. of Questions : 6]

SEAT No. :

**P2982**

[Total No. of Pages :2

**[5452] - 206**

**F.Y. B. Pharmacy**

**PHARMACEUTICAL ANALYSIS - I**

**(2013 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks :70*

*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 theoretical considerations, limitations for Non-aqueous solvents in non-aqueous titration. **[10]**

OR

What are neutralization titrations? Explain in detail Neutralization curves with suitable examples.

**Q2)** Answer the following (any five). **[15]**

- a) Define Primary standard. Enlist requirements of primary standards.
- b) Discuss correlation coefficient and coefficient of determination.
- c) What are Mixed indicators give examples.
- d) Explain effect of temperature on non-aqueous titrations.
- e) What is buffer index? Write equation to calculate buffer index.
- f) Discuss in brief Nernst equation.
- g) Explain the term confidence limit and significant figures.

**Q3)** Write short notes on (any two) **[10]**

- a) Primary and secondary standards.
- b) Indicators in Non-aqueous titrations.
- c) Test of significance.
- d) Titration of amino acid.

***P.T.O.***

## SECTION - II

**Q4)** What is pM indicator? Explain titration curve for Complexometric titration. Give an account of masking and demasking agents. [10]

OR

Differentiate between Iodimetric and Iodometric titrations. Explain importance of pH conditions for each of them. Add a note on Ceriometry.

**Q5)** Answer the following (any five). [15]

- a) How will you prepare and standardize 0.1 N AgNO<sub>3</sub> solution.
- b) Differentiate between co-precipitation and post precipitation.
- c) Explain the term Ligand and Sequestering agent.
- d) Compare Mohr's method and Volhard's method.
- e) Discuss titration curve for redox titration.
- f) Assay of Sodium Chloride injection as per I.P.
- g) Explain common ion effect. How is it utilized for controlling the concentration of weak electrolyte.

**Q6)** Write short notes on (any two). [10]

- a) Permanganate Titrations.
- b) Filtration and washing of precipitate in gravimetry.
- c) Replacement EDTA Complexometric titrations (Back titrations).
- d) Adsorption indicators.



Total No. of Questions : 6]

SEAT No. :

**P2983**

[Total No. of Pages :2

**[5452] - 301**

**Second Year B. Pharmacy**

**PHYSICAL PHARMACEUTICS - I**

**(2013 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks :70*

*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)** What are different methods used for liquefaction of gases? With neat and labelled diagram describe principle involved in two phase systems of aerosols. **[10]**

OR

What is Gibbs phase rule? Explain the terms involved in it. Add a note on pharmaceutical applications of phase rule. **[10]**

**Q2)** Attempt any five of the following. **[15]**

- a) Define polymorphism. Give different applications of polymorphism with examples.
- b) What is crystallization? Explain crystal forms and crystal habits.
- c) Explain glass transition temperature.
- d) Explain: Compressibility factor and its importance.
- e) Discuss deviations from gas theory.
- f) Explain two components system.
- g) Discuss Critical gas constants.

**Q3)** Write short notes on (any 2) **[10]**

- a) Detection techniques for polymorphs.
- b) Methods of crystal analysis.
- c) One component system.
- d) Glass transition temperature.

***P.T.O.***

## SECTION - II

**Q4)** What are colligative properties? Explain any one property with its method. [10]

OR

Explain in detail second law of thermodynamics. [10]

**Q5)** Answer the following (any five). [15]

- a) Differentiate between fractional distillation and steam distillation.
- b) Define the terms activity, activity coefficient and osmotic coefficient.
- c) Comment on problems involving molecular weight determinations w.r.t. colligative properties.
- d) Write the applications of distribution phenomenon.
- e) Write the difference between equivalent conductance and specific conductance.
- f) Comment on solubility of weak electrolytes.
- g) Define enthalpy and entropy.

**Q6)** Write short notes on (any two). [10]

- a) Elevation of boiling point.
- b) First law of thermodynamics.
- c) Depression of freezing point.
- d) Nernst distribution law and its limitations.



Total No. of Questions : 6]

SEAT No. :

**P2984**

[5452]-302

[Total No. of Pages : 2

**S.Y. B. Pharm.**

**PHARMACEUTICAL MICROBIOLOGY**

**(2013 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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)** Write in details structure, reproduction, nutritional requirement and growth curve of bacteria. **[10]**

OR

Define Culture media and explain different types of media.

**Q2)** Answer the following (ANY FIVE) : **[15]**

- a) Write Medical importance of Yeast & Moulds.
- b) Justify bacterial endospore impart heat resistance to bacteria.
- c) How will you detect presence of E. Coli in nonsterile pharmaceutical preparation's?
- d) Differentiate between Gram +ve and Gram –ve bacterial cell.
- e) Justify Agar is used as solidifying agent.
- f) Write the contribution of Louis Pasteur in the field microbiology.
- g) Explain the significance of Log phase and Lag phase in bacterial growth curve.

**Q3)** Write a note on (ANY TWO) : **[10]**

- a) Preservation of Microbial culture
- b) Prebiotic and Probiotics
- c) Multiplication of Human Virus
- d) Counting method

**P.T.O.**

**SECTION - II**

**Q4)** Define Antigen and Antibody. Describe five different classes of Immunoglobulin. **[10]**

OR

Define Vaccine. Write the general method of preparation and Quality control of bacterial vaccine.

**Q5)** Answer the following (ANY FIVE) : **[15]**

- a) Write a principle and characteristics of antigen-antibody reactions.
- b) Differentiate between Active and Passive Immunity.
- c) What do you mean by Microbial Virulence?
- d) Write a note on phagocytosis.
- e) Write note on Pasteurization.
- f) Comment “Moist heat sterilization is more superior to dry heat sterilization”?
- g) Differentiate between endotoxin and exotoxin.

**Q6)** Write a note on (ANY TWO) : **[10]**

- a) ELISA
- b) Phenol Coefficient test
- c) Moist Heat sterilization
- d) HMI and CMI



Total No. of Questions : 6]

SEAT No. :

**P2985**

**[5452]-303**

[Total No. of Pages : 2

**S. Y. B. Pharm.**

**PHARMACEUTICAL BIOCHEMISTRY**

**(2013 Pattern) (Semester - III) (Theory)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Explain effect of substrate concentration on enzyme activity. **[10]**

OR

Explain Transcription in Eucaryotic cell.

**Q2)** Attempt short notes on **any five** of the following : **[15]**

- a) Biological role of glucose and glycogen.
- b) End group analysis.
- c) Classification of amino acids based on structure.
- d) Scope of Pharmaceutical Biochemistry in Pharmaceutical Sciences.
- e) Biological role of any three important amino acids.
- f) Genetic code of Eucaryotic cell.
- g) Applications of enzymes with emphasis on marker enzymes.

**Q3)** Write notes on **any two** of the following : **[10]**

- a) Globular proteins
- b) Enzyme inhibition
- c) Nucleotides and Nucleosides
- d) Functions of Lipids

*P.T.O.*

## SECTION - II

**Q4)** Give a detailed account of Urea Cycle and its biological significance. [10]

OR

Explain the synthesis of Glycogen in detail. How is Glucose released from Glycogen?

**Q5)** Attempt short note on **any five** of the following : [15]

- a) Homeostasis of Glucose
- b) Utilization of Cholesterol
- c) Fate of Pyruvate
- d) HMP shunt
- e) Importance of Glycolysis
- f) Triglyceride metabolism
- g) Vitamin C

**Q6)** Write notes on **any two** of the following : [10]

- a) Explain the steps in Protein Synthesis.
- b) Explain TCA cycle and significance in brief.
- c) Give an account of Cholesterol synthesis.
- d) Explain beta oxidation.



Total No. of Questions : 6]

SEAT No. :

P2986

[5452]-304

[Total No. of Pages : 3

S.Y. B. Pharm.

PHARMACEUTICAL ORGANIC CHEMISTRY - III  
(2013 Pattern) (Semester - III) (Theory)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Answers to the two sections should be written in separate answer sheets.
- 4) Draw neat diagrams and structures wherever necessary.

SECTION - I

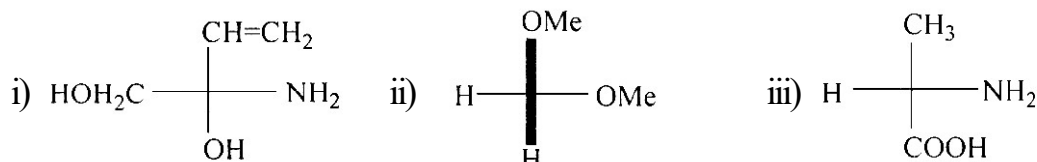
Q1) What is racemic modification? Enlist the different methods of resolution of racemic mixture. Discuss any four methods in detail. [10]

OR

Why chair conformation of cyclohexane is more stable than boat conformation? Draw the newman projection formulae for all the configurations of 1,2 and 1,4-dimethyl cyclohexane. Comment on their stabilities.

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

- a) Classify natural amino acids with examples.
- b) Establish R and S configurations of the followings



- c) Draw the structure of following peptides  
i) Gly-Ala-Phe    ii) Gly-Gly    iii) Tyr-Ala-Ser.
- d) Explain diastereomerism with example.
- e) What are amino acids? Discuss any two methods of synthesis of amino acids.
- f) Define the following terms  
i) Enantiomer  
ii) Conformation  
iii) Optical isomerism

P.T.O.

- g) Draw the fischer projection formula of followings
- Meso 2,3-dibromobutane
  - (R)-2-Bromobutane
  - (S)-Glyceraldehyde.

**Q3)** Write short note on (Any Two)

[10]

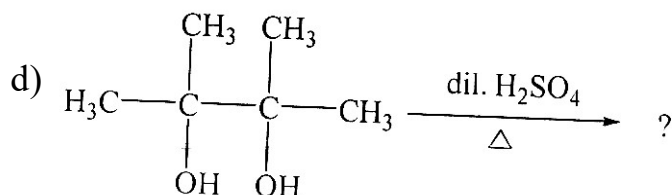
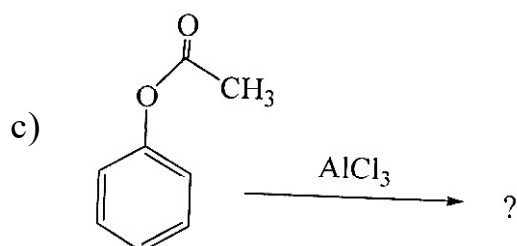
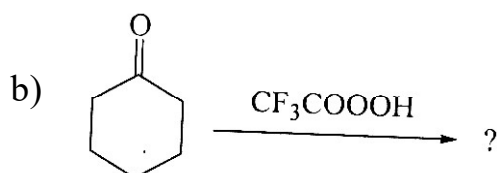
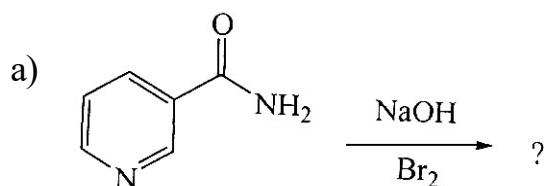
- Isoelectric point.
- Conformational analysis of n-Butane.
- Geometrical isomerism.
- Conformational isomerism of decalin.

### SECTION - II

**Q4)** What are molecular rearrangements? Discuss Benzilic acid and Wolf rearrangement with mechanism. [10]

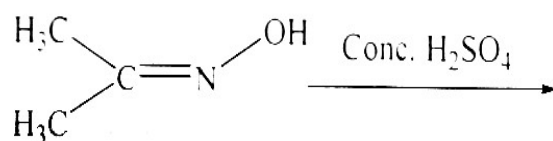
OR

Identify and complete the following reaction with mechanism involved



**Q5)** Answer the following (any five) **[15]**

- a) Define nucleophilic rearrangement reactions. Enlist the rearrangements of electron deficient nitrogen atom.
- b) Write any three reactions of anthracene.
- c) Discuss any one rearrangement to electron deficient oxygen atom.
- d) Explain stereochemistry of pinacol-pinacolone rearrangement reaction.
- e) Explain reaction and mechanism of curtius rearrangement.
- f) Write any three preparation methods of naphthalene
- g) Complete the following reaction with mechanism.



**Q6)** Write short note on (any two) **[10]**

- a) Reactions of phenanthrene
- b) Bayer-Villiger oxidation
- c) Cope rearrangement
- d) Hoffman rearrangement



Total No. of Questions :6]

SEAT No. :

**P2987**

**[5452]-305**

[Total No. of Pages : 2

**S. Y. B. Pharmacy**  
**PHARMACOLOGY - I**  
**(2013 Pattern) (Semester-III)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1)** Explain in detail drug biotransformation process. Enlist various reactions involved in drug biotransformation. **[10]**

OR

Explain in detail process of drug absorption and factors affecting drug absorption. **[10]**

**Q2)** Answer the following (Any five):

- a) Explain the term first pass metabolism. **[3]**
- b) Explain structure and function of cell membrane. **[3]**
- c) Explain clinical significance of half life of drug. **[3]**
- d) Explain various sources of drugs. **[3]**
- e) Write about essential drug concept. **[3]**
- f) Explain mechanism of drug action through enzyme induction. **[3]**
- g) Therapeutic drug monitoring **[3]**

**Q3)** Solve any two :

- a) Explain in detail various routes of administration with their advantages and disadvantages. **[5]**
- b) Define apparent volume of distribution. Explain clinical significance of volume of drug distribution. **[5]**
- c) Define bioavailability of drug. Discuss the factors affecting bioavailability. **[5]**
- d) Write in detail factors affecting excretion of drugs. **[5]**

**P.T.O.**

## SECTION - II

**Q4)** Explain in detail drug therapy in geriatric patients. **[10]**

OR

Discuss synthesis, storage, release & pharmacological actions of serotonin. **[10]**

**Q5)** Answer the following (any five) :

- a) Define carcinogenicity, mutagenicity, teratogenicity. **[3]**
- b) Define & classify drug interactions with examples. **[3]**
- c) Discuss pharmacological actions of histamine. **[3]**
- d) Explain drug synergism with example. **[3]**
- e) Define & classify adverse drug reactions with examples. **[3]**
- f) Explain structure & transduction mechanism of G- protein coupled receptor. **[3]**
- g) Discuss drug receptor interaction. **[3]**

**Q6)** Write short notes on (any two) : **[10]**

- a) Dose response curve
- b) Drug antagonism
- c) Factors affecting drug action
- d) Sites & mechanisms of drug action.



Total No. of Questions : 6]

SEAT No. :

**P2988**

[Total No. of Pages : 2

[5452]-306

**S.Y. B. Pharmacy**

**PHARMACOGNOSY AND PHYTOCHEMISTRY - I**

**(2013 Pattern) (Semester - III)**

*Time :3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

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

**SECTION - I**

**Q1) Solve any one:** **[10]**

- a) Explain scheme for pharmacognostic account of crude drugs. Give the significance of each parameter.
- b) What are carbohydrates? Give in detail occurrence, Classification, properties of carbohydrates along with suitable examples.

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

- a) Define and classify lipids with example.
- b) Write different chemical tests for the identification of castor oil.
- c) Write a note on Tragacanth.
- d) Write different chemical tests for the identification of lipids.
- e) Write biological source and uses of pectin.
- f) Explain method of preparation of silk.
- g) Write biological source, properties and uses of bromelin.

**Q3) Write notes on any two:** **[10]**

- a) General biogenesis of Lipid.
- b) Preparation of Shark liver oil.
- c) Classification of Protein.
- d) Differentiate between primary and secondary metabolites with suitable examples.

**P.T.O.**

## SECTION - II

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

a) Define and classify Glycosides. Explain properties, chemical test and general method of extraction of Glycosides.

OR

b) Define and classify Tannins. Explain their methods of extraction.

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

a) Give the chemical tests for Cardio active glycosides.

b) Give the occurrence and properties of tannins.

c) Give the biological source, chemical constituents of Digitalis.

d) Differentiate between Alexandrian Senna and Indian senna.

e) Give the biological Source, chemical constituents of Liquorice.

f) Give the chemical tests for Anthraquinone Glycosides.

g) Write short note on rhubarb.

**Q6)** Write notes on any two: **[10]**

a) Preparation of Black catechu.

b) Pharmacognostic study of Amla.

c) Differentiate between Black catechu and Pale catechu.

d) Pharmacognostic study of Kalmegh.



Total No. of Questions : 6]

SEAT No. :

**P2989**

**[5452]-401**

[Total No. of Pages : 2

**S. Y. B. Pharmacy**  
**PHYSICAL PHARMACEUTICS - II**  
**(2013 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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)** Define Surface and Interfacial tension. Enlist methods to determine surface and interfacial tension. With a neat and labelled diagram explain working of duNouy tensiometer. **[10]**

OR

- a) Mention the chemical degradative reactions which cause instability in pharmaceutical formulations. Briefly state reasons and protection for any two of these routes of decomposition. **[7]**
- b) Calculate reaction rate and shelf life of the product that decomposes by first order. The half life of drug is 65 days. **[3]**

**Q2)** Attempt any five of the following: **[15]**

- a) What do you understand by Micellar solubilization? Explain.
- b) Define and explain 'order of reaction'. What is meant by pseudo first order reaction?
- c) Classify surfactants. Give any two methods to determine HLB value of surfactants.
- d) Define and write the equation for spreading coefficient. Suggest any two methods to improve the spreading of a medicament.
- e) Calculate the activation energy of a reaction whose reaction rate at 27°C gets doubled for 10°C rise in temperature ( $R=8.314JK^{-1}mol^{-1}$ ).
- f) Explain HLB scale with its utility in pharmaceutical formulations.
- g) Discuss Drop weight and Drop count methods to determine surface tension of liquid.

**P.T.O.**

**Q3) Answer the following questions (Any 2):** **[10]**

- a) Justify the following statements:
  - i) Increase in reaction temperature by 10°C increases the rate of reaction by 2 or 3 fold.
  - ii) Water rises immediately up in the capillary tube when placed in a beaker of water.
- b) Write short note on Accelerated Stability Testing.
- c) Explain: adsorption isotherms.
- d) Discuss Pharmaceutical and Medicinal applications of surfactants.

### **SECTION-II**

**Q4) Classify various rheological systems. Write about applications of rheology in pharmacy.** **[10]**

OR

Explain various fundamental and derived properties of powders. Write about methods of determination of surface area of powders.

**Q5) Answer the following (any five):** **[15]**

- a) Define thixotropy and one method to measure it.
- b) Write about Schultz Hardy rule.
- c) Write about sieve analysis for particle size measurement.
- d) Define gold number with example.
- e) Write about Martin's and Ferret's diameter.
- f) Briefly write about optical properties of colloids.
- g) What is viscoelasticity?

**Q6) Write short notes (any two):** **[10]**

- a) Donnan membrane equilibrium.
- b) Particle size measurement by optical microscopy.
- c) Capillary viscometers.
- d) Lyophilic and lyophobic colloids.



Total No. of Questions : 6]

SEAT No. :

**P2990**

[Total No. of Pages :2

**[5452] - 402**

**S.Y. B. Pharmacy**

**PATHOPHYSIOLOGY AND CLINICAL BIOCHEMISTRY**

**(2013 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw well labeled diagrams wherever necessary.*

**SECTION - I**

**Q1)** Define and classify ulcer. Explain detail pathophysiology of Peptic Ulcer.

**[10]**

OR

Discuss in detail pathophysiology of cardiac shock.

**[10]**

**Q2)** Attempt any five of the following.

**[15]**

- a) Define Hepatitis. Enlist types of hepatitis.
- b) Discuss the clinical manifestations of fatty liver.
- c) Enlist types of heart failure.
- d) Write etiology of coronary artery disease.
- e) Define COPD. Enlist its types.
- f) Define:
  - i) Leukemia
  - ii) Constipation.
  - iii) Arrhythmia.
- g) What is meant by Gall stones? Write its symptoms.

**Q3)** Write note on following (any two).

**[10]**

- a) Parkinson's disease.
- b) Cell injury and inflammation.
- c) Inflammatory bowel disease.
- d) Varicose veins.

**P.T.O.**

**SECTION - II**

**Q4)** Discuss in detail pathophysiology and types of epilepsy. **[10]**

OR

Discuss etiology and treatment of malaria in detail. **[10]**

**Q5)** Attempt any five of the following. **[15]**

- a) Define and enlist types of depression.
- b) Write etiology of urinary calculi.
- c) Write the causative agents of Syphilis and Gonorrhoea.
- d) Enlist the clinical manifestations of diabetes mellitus.
- e) Explain in brief, pathophysiology of pain.
- f) Define:
  - i) Hyperthyroidism
  - ii) Dysmenorrhoea,
  - iii) Infertility
- g) Write the causes and types of insomnia.

**Q6)** Write note on following (any two). **[10]**

- a) Malignancy.
- b) Acute urinary tract infections.
- c) Schizophrenia.
- d) Osteoarthritis.



Total No. of Questions : 6]

SEAT No. :

**P2991**

[5452]-403

[Total No. of Pages : 2

**S.Y. B. Pharmacy**

**PHARMACEUTICAL ORGANIC CHEMISTRY - IV**

**(2013 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Answers 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)** Give a detail account of guidelines of retrosynthesis and disconnection involving C-X and C-C bonds. **[10]**

OR

Answer the following with chemical reactions **[10]**

How will you obtain :

- a) Furan from Ethylacetoacetate
- b) Pyrrole from acetylene
- c) Quinoline from o-nitrotoluene
- d) Indole from o-nitrotoluene
- e) Imidazole from paraldehyde

**Q2)** Answer in short (ANY FIVE) **[15]**

- a) Give any three methods of synthesis of furan.
- b) Give reason : Pyridine is much stronger base than pyrrole.
- c) Draw resonance structures of :
  - i) Furan
  - ii) Pyridine
- d) Give any three methods of synthesis of pyrrole.
- e) Draw the following structures with numbering :
  - i) 7-mercaptoquinazoline
  - ii) 2-acetoxypyridazine
  - iii) 4-furfuryl-cinnoline
- f) Give any three reactions of indole.
- g) Give any one method of preparation of quinoline.

**P.T.O.**

- Q3)** Write a short note on (ANY TWO) [10]
- Electrophilic substitution reactions of Furan
  - Reactions of quinoline
  - Retrosynthetic route of Ibuprofen
  - Methods of synthesis of imidazole

**SECTION - II**

- Q4)** a) Define carbohydrates? Explain the open and cyclic structure of glucose. [5]
- b) Explain Killiani-Fischer Synthesis and Ruff Degradation reactions. [5]

OR

- Q4)** What is combinatorial synthesis? Explain various techniques in combinatorial chemistry. [10]

- Q5)** Solve any five of the following. [15]

- Explain the basic principle behind Microwave synthesis.
- Give detailed account of muta-rotations of (+) Glucose.
- Explain reducing sugars with examples.
- Give any three reactions of glucose.
- Explain applications of Combinatorial chemistry.
- Write in brief about the linkers in solid support synthesis.
- Write the significance and medicinal importance of Carbohydrates.

- Q6)** Write short notes on any two of the following. [10]

- Establishment of Structure of Fructose.
- Use of Microwave in organic synthesis.
- Differentiation between Glucose and Fructose with the help of chemical reactions.
- Explain various deconvolution methods in combinatorial chemistry.



Total No. of Questions : 6]

SEAT No. :

**P2992**

[5452]-404

[Total No. of Pages : 2

**S.Y. B. Pharmacy**

**2.4.4 : PHARMACEUTICAL ANALYSIS - II**

**(2013 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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)** Write principle of Potentiometry. Discuss in detail different types of electrodes. **[10]**

OR

Explain in detail different types of conductometric titration curves. Write advantages of conductometric end point detection. **[10]**

**Q2)** Attempt any five of the following. **[15]**

- a) Define cell constant. How will you calibrate conductometer?
- b) Explain mechanisms of mass transfer in electroanalytical techniques.
- c) Define pH and discuss measurement of pH.
- d) Write in brief about ilkovic equation.
- e) Explain need of hydration of glass electrode.
- f) Draw neat labeled diagram of electrochemical cell. Explain terms associated with Nernst equation.
- g) Explain in brief applications of polarography.

**Q3)** Write notes on any two of the following. **[10]**

- a) Biamperometry
- b) Conductivity meter
- c) High frequency titrations
- d) Applications and advantages of amperometry

**P.T.O.**

## SECTION - II

**Q4)** Write about principle and theory of coulometric techniques. Discuss in detail end point determination of coulometric analysis. **[10]**

OR

Define Refractive Index? Discuss in detail about construction and working of Abbe's refractometer. **[10]**

**Q5)** Attempt any five of the following. **[15]**

- a) Explain the term Circular dichroism.
- b) Explain the types of plane polarize light.
- c) Explain about Refractive index determination.
- d) Write about Karl Fisher titration apparatus.
- e) Discuss in brief oxygen combustion flask techniques.
- f) Write the applications of coulometric analysis.
- g) Give an account on Cotton effect.

**Q6)** Write notes on any two of the following. **[10]**

- a) Kjeldahl's method.
- b) Coulometric cell
- c) Polarimeter
- d) Optical activity



Total No. of Questions :6]

SEAT No. :

**P2993**

**[5452]-405**

[Total No. of Pages : 2

**S.Y. B. Pharm.**

**PHARMACOGNOSY AND PHYTOCHEMISTRY - II**

**(2013 Course) (Semester-IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1) Give pharmacognostical account of Ephedra. [10]**

OR

Give pharmacognostical account of Cinchona. [10]

**Q2) Answer any five questions. [15]**

- a) Draw transverse section of Datura leaf.
- b) Differentiate between True alkaloids and Pseudo alkaloids.
- c) State the hydrolysis product of reserpine.
- d) Draw the structure of Psychotrine, cepheline and emetine.
- e) Write biological source, chemical constituents and uses of any one alkaloidal drug from Imidazole class.
- f) Write Vitali Morin Test and give its significance.
- g) Differentiate between Panama and Brazilian ipecac.

**Q3) Write short notes on (Any Two): [10]**

- a) Purine alkaloids
- b) Ergot
- c) Bellodonna
- d) Adultrants and substitutes of Nux vomica

***P.T.O.***

## SECTION - II

**Q4)** What are Regins? Classify with examples. Give the pharmacognostic account on “Guggul”. **[10]**

OR

What are terpenoids? Explain the chemistry and general biogenetic pathway of terpenoids.

**Q5)** Answer any five questions. **[5×3=15]**

- a) Explain cultivation, collection and uses of Clove.
- b) Explain Enfleurage method with applications.
- c) Give the biological source, chemical constituents and uses of Annato.
- d) Give the structure and uses of Podophyllin.
- e) Give the chemical constituents, chemical test and uses of Cannabis.
- f) Explain the histological characteristics of Cinnamon.
- g) Enlist various species and uses of Yew.

**Q6)** Attempt any two of the following. **[2×5=10]**

- a) Give the Pharmacognostic account on “Boswellia”.
- b) Explain quantitative analysis of volatile oils.
- c) Write a note on Ginseng.
- d) Explain in brief pharmacognostic study of Sandal wood and Artemisia.



Total No. of Questions : 6]

SEAT No. :

**P2994**

**[5452]-406**

[Total No. of Pages : 2

**Second Year B. Pharmacy**  
**PHARMACEUTICAL ENGINEERING**  
**(2013 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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 mechanism and theory of drying along with factors affecting it. Explain principle, construction and working of freeze drier. **[10]**

OR

Give classification of evaporators and explain capacity and efficiency of multiple effect evaporator in comparison to single effect evaporator. **[10]**

**Q2)** Solve the followings (Any five): **[15]**

- a) Explain farmer's law of heat transfer.
- b) Explain theory of boiling inside a vertical tube.
- c) Explain thermostatic traps for removal of condensates.
- d) Explain factors affecting drying process.
- e) Explain principle, working of centrifugal rotary evaporator.
- f) Write a note on interphase mass transfer.
- g) Explain methods for feeding of evaporators.

**P.T.O.**

**Q3) Write notes on (Any Two):** **[10]**

- a) Tubular evaporator.
- b) Drum drier.
- c) Heat exchangers.
- d) Flash dryer.

**SECTION-II**

**Q4) Define and explain distillation process with the help of boiling point diagrams. Add a note on distillation of miscible and immiscible systems.** **[10]**

OR

Explain crystallisation by cooling mechanism. Explain different types of crystallisers based on principle of cooling. **[10]**

**Q5) Solve the followings (Any five):** **[15]**

- a) Explain Mier's theory of super saturation.
- b) Explain construction and working of orifice meter.
- c) Write a note on separation of a zeotropes.
- d) Explain factors affecting corrosion process.
- e) Explain significance of Reynold's number.
- f) Explain material and energy balance equation for flow of fluids.
- g) Explain factors affecting caking of crystals and methods to prevent it.

**Q6) Write a note on (Any Two):** **[10]**

- a) Mechanisms of crystal growth.
- b) Variable area flow meter.
- c) Fractionating columns in distillation.
- d) Types of corrosion and methods to combat it.



Total No. of Questions : 6]

SEAT No. :

**P2995**

[5452]-501

[Total No. of Pages : 2

**T. Y. B. Pharm.**

**INDUSTRIAL PHARMACY - I**

**(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Give account on Biopharmaceutical consideration for development of Dosage form. **[10]**

OR

Discuss in detail manufacturing defects of Tablet.

**Q2)** Solve ANY FIVE the following. **[15]**

- a) Discuss Slugging and Direct Compression method.
- b) Discuss process of Spheronization.
- c) What is enteric coated tablet? Give three examples of enteric coated polymers.
- d) Write at least three names for tablet hardness tester.
- e) Discuss Friability test of tablet as per IP.
- f) Give account on types of Tablet.
- g) Write a note on super disintegrating agents with example.

**Q3)** Answer ANY TWO. **[10]**

- a) Give account on Weight Variation and content uniformity of tablet.
- b) Write a note on Mouth Dissolving Tablet.
- c) Give account on directly compressible materials with advantages of direct compression technique.
- d) Discuss method of preparation of Effervescent Tablet.

**P.T.O.**

**SECTION - II**

**Q4)** Discuss in detail steps involved in Sugar Coating Process. **[10]**

OR

Discuss variables in Film Coating Process.

**Q5)** Solve ANY FIVE of the following. **[15]**

- a) Give note on Electrostatic coating and Dip coating.
- b) Give details on Typical shell hardness ratio and their use.
- c) PQC of Hard gelatin capsule.
- d) Enlist additives added in gelatin mass with their role.
- e) Give note on Orange Peel Effect.
- f) What is Bloom strength and how it is measure?
- g) Filling Capacity of Empty Capsules.

**Q6)** Solve ANY TWO. **[10]**

- a) Discuss in detail Rotary Die process.
- b) Give account on Fluidized Bed Coater.
- c) Give details on Picking and Sticking with reasons and remedies.
- d) Give account on Glatt immersion sword system.



Total No. of Questions : 6]

SEAT No. :

**P2996**

[5452]-502

[Total No. of Pages : 2

**T. Y. B. Pharm.**

**3.5.2 : PHARMACEUTICAL ANALYSIS - III**

**(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Explain principle and instrumentation of Flame Photometry. Discuss in brief about the pharmaceutical applications of Flame Photometer. **[10]**

OR

Draw a neat diagram of UV-Visible Spectrophotometer. Explain in detail about the radiation sources and monochromators used in UV-Visible Spectrophotometer.

**Q2)** Attempt any five questions from the following : **[15]**

- a) Write a note of liquid-liquid extraction
- b) Draw a neat diagram and explain working of photomultiplier tube.
- c) State Beer-Lambert's law. Discuss about Instrumental deviation from Beer's law.
- d) Discuss on atomic & molecular spectroscopy.
- e) Define Chromophore, Auxochrome, Hypsochromic shift and Bathochromic Shift with suitable examples.
- f) Discuss on hollow cathode lamp
- g) What types of electrons in a molecule are generally involved in the absorption of UV or Visible radiation?

**Q3)** Write a note on any two : **[10]**

- a) Separating analytes from interferents
- b) Line broadening and Doppler effect
- c) Woodward Fieser Rule
- d) Derivative spectrophotometry

**P.T.O.**

## SECTION - II

**Q4)** Discuss in detail about instrumentation of Atomic Emission Spectrophotometry. **[10]**

OR

Discuss different deactivation process involved in photoluminescence phenomenon.

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

- a) Explain excitation and emission spectra.
- b) Discuss about Nephelometer.
- c) Write advantages of Atomic Absorption Spectrophotometry.
- d) Give an account on source used in Atomic Emission Spectroscopy.
- e) Explain factor affecting fluorescence and phosphorescence.
- f) Explain Quenching of fluorescence.
- g) Discuss source used in fluorimetric analysis.

**Q6)** Write a note on any two : **[10]**

- a) Oxidants and fuels in Atomic Absorption Spectroscopy.
- b) Spectrofluorimeter.
- c) Theory of Atomic Emission Spectroscopy.
- d) Applications of turbidometric analysis.



Total No. of Questions : 6]

SEAT No. :

**P2997**

[Total No. of Pages : 2

**[5452]-503**

**T.Y. B. Pharm.**

**MEDICINAL CHEMISTRY - I**

**(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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 side indicate full marks.*

**SECTION - I**

**Q1)** Explain structure & Function of biological membrane. Add a note on absorption of drugs. **[10]**

OR

Explain chemistry of cardiac glycosides. Discuss its SAR in detail

**Q2)** Attempt any Five of the following : **[15]**

- a) Define and classify bioisosters with suitable examples.
- b) Write about non-glycosidic cardiotonics.
- c) Discuss chemistry of statins.
- d) Explain ferguson principle.
- e) Write a note on hydrogen bonding.
- f) Write a note on anti-coagulants.
- g) Explain stereo-chemical aspects of drug actions

**Q3)** Attempt any two of the following : **[10]**

- a) Write a note on acetyl cholinesterase inhibitors
- b) Explain Phase-I biotransformation reaction in drug metabolism with suitable example.
- c) Write about atropine as cholinergic antagonist
- d) Explain drugs acting on Renin-Angiotensine pathway

**P.T.O.**

## SECTION - II

**Q4)** Give a complete account on antihypertensive agents emphasizing SAR, MOA and its uses **[10]**

OR

Classify diuretics. Give MOA and SAR of thiazide diuretics

**Q5)** Attempt any Five of the following : **[15]**

- a) Write synthesis of Furosemide
- b) Classify ganglionic blocker with example. Discuss any one.
- c) Discuss briefly about ACE inhibitors
- d) Write SAR of nicotinic Ach receptor antagonist.
- e) Classify antihyperlipidemic agents with structure of one drug from each class.
- f) Explain in detail biosynthesis and release of Nor-epinephrine
- g) Give chemistry and SAR of acetylcholine.

**Q6)** Attempt any two of the following : **[10]**

- a) Cardiac glycosides
- b) Anticholinesterase
- c) Alpha receptor antagonists
- d) Anti-anginal drug



Total No. of Questions :6]

SEAT No. :

**P2998**

**[5452]-504**

[Total No. of Pages : 2

**Third Year B. Pharmacy**  
**3.5.4. PHARMACOLOGY - II**  
**(2013 Pattern) (Semester-V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answer to the two section 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)** Define Adrenergic drugs. Classify adrenergic drugs with suitable example on the basis of their therapeutic uses. Explain metabolism of adrenaline therapeutic uses, and adverse effects of adrenaline. **[10]**

OR

Define parasympathomimetic drugs. Classify parasympathomimetic agents with suitable example. Explain the biosynthesis, storage, release and metabolism of acetylcholine. **[10]**

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

- a) Classify anticholinergic drugs with suitable example.
- b) Define the following terms :
  - i) Miotics
  - ii) Mydriasis
  - iii) Pheochromocytoma
- c) Explain biosynthesis of adrenaline.
- d) Give therapeutic uses of atropine.
- e) How myasthenic crisis and cholinergic crisis is differentiated?
- f) Classify skeletal muscle relaxants with suitable example.
- g) Classify anticholinesterases with suitable example.

**Q3)** Write short notes on (Any 2) : **[10]**

- a) Ganglion blocker
- b) Pharmacotherapy of myasthenia gravis
- c) Beta blocker
- d) Indirectly acting sympathomimetic agents

**P.T.O.**

## SECTION - II

**Q4)** Discuss biosynthesis, metabolism, mechanism of action, pharmacological actions and therapeutic effects of testosterone. **[10]**

OR

What is the mechanism of action, the pharmacological actions, adverse effects and therapeutic uses of sulphonylureas and biguanides. **[10]**

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

- a) Therapeutic uses of antithyroid drugs.
- b) Explain mechanism of action of oxytocin.
- c) Calcium homeostasis.
- d) Explain the role of gonadotrophins in male.
- e) Write the action of prolactin.
- f) Classify oral hypoglycemic agents.
- g) Adverse reactions of Insulin.

**Q6)** Write short note on (Any 2) : **[10]**

- a) Therapeutic effects of glucocorticoids
- b) Oxytocics
- c) Antiandrogens
- d) Hormones of Adenohypophysis



Total No. of Questions : 6]

SEAT No. :

**P2999**

[Total No. of Pages : 2

**[5452]-505**

**T.Y.B. Pharmacy**

**ANALYTICAL PHARMACOGNOSY AND EXTRACTION  
TECHNOLOGY**

**(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

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

**SECTION - I**

**Q1)** Attempt any one of the following. **[10]**

- a) Explain the principle, instrumentation and application of HPLC.
- b) Write a note on Good practices for herbal quality control laboratories.

**Q2)** Attempt any five of the following. **[15]**

- a) Give the chemical test for identification of Atropine and Sennosides.
- b) How is R<sub>f</sub> value calculated? Give the significance.
- c) Explain the principle of Paper Chromatography.
- d) Draw the structures of
  - i) Reserpine
  - ii) Eugenol
  - iii) Caffeine
- e) Describe the principle and applications of sublimation.
- f) Explain the significance of Bitterness value in herbal drug standardization.
- g) Write a short note on Aflatoxins.

**Q3)** Attempt any two. **[10]**

- a) Write a detailed note on Supercritical fluid extraction.
- b) Explain Extraction of Peppermint oil by steam distillation.
- c) Give the significance of analytical techniques in the quality control of Herbal drugs.
- d) Enlist Non-chromatographic separation techniques. Explain any one.

**P.T.O.**

## SECTION - II

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

Explain the principle, instrumentation and application of Soxhlet extraction method.

Describe any two quality control parameters as per WHO guidelines which determines the efficacy of herbal drugs.

**Q5)** Attempt any five of the following. **[15]**

- a) Describe the extraction of rose oil.
- b) Explain 'Haemolytic activity' as per WHO guidelines.
- c) Give the chemical tests for strychnine and Piperine.
- d) Explain the isolation procedure for caffeine.
- e) Comment on 'Swelling index' as per WHO guidelines.
- f) Explain the merits and demerits of sonication.
- g) Give the isolation procedure for Taxol.

**Q6)** Attempt any two. **[10]**

- a) Explain the maceration and percolation process.
- b) Define adulteration and explain it's types with suitable examples.
- c) Enlist parameters of proximate phytochemical analysis.
- d) Describe principle, instrumentation and application of TLC.



Total No. of Questions : 6]

SEAT No. :

**P3000**

[Total No. of Pages : 2

**[5452]-506**

**T.Y. B. Pharmacy**

**PHARMACEUTICAL BUSINESS MANAGEMENT & DISASTER  
MANAGEMENT**

**(2013 Pattern) (Semester - V)**

*Time :3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

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

**SECTION - I**

**Q1)** Give detailed account of Decision Making. **[10]**

OR

Give different principles and various flow charts of organizing.

**Q2)** Answer Any Five (Each three marks) **[15]**

- a) What are concepts of controlling?
- b) Define objective. Give importance of objective.
- c) Write short note on Inventory control.
- d) Describe various types of planning.
- e) Explain the responsibilities of manager.
- f) Define Management Information System. Give its benefits.
- g) What do you mean by *Management audit*?

**Q3)** Write note on any two (Each Five marks): **[10]**

- a) ABC technique in inventory control with suitable example.
- b) Departmentalization
- c) Fayal's Contribution in modern management
- d) Brief History of Management

**P.T.O.**

## SECTION - II

**Q4)** Define communication. Explain the process of communication and write different forms of communication.

OR

Define Pricing. Explain factors affecting pricing of a Pharmaceutical product and write procedure for determination of pricing. **[10]**

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

- a) Explain the need of performance appraisal
- b) Explain Hertzberg' theory of motivation
- c) Write different methods of Advertising.
- d) Explain different methods of sales forecasting.
- e) What is sales promotion. Write about its methods.
- f) Explain various causes of Disaster.
- g) What is the importance of marketing research.

**Q6)** Write a short note on (Any Two) **[10]**

- a) Managerial Grid
- b) Product life cycle
- c) Manmade disaster
- d) Ethics of sales



Total No. of Questions : 6]

SEAT No. :

P3692

[Total No. of Pages : 2

[5452]-507

**T.Y. B. Pharmacy**

**ACTIVE PHARMACEUTICAL INGREDIENT TECHNOLOGY**

**(2013 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate answer books.*

**SECTION - I**

**Q1)** Attempt any one question.

**[10]**

- a) What is amination by reduction? Discuss various methods of preparation of amines. Describe the manufacture of any one Active pharmaceutical ingredient by reductive amination process.

OR

- b) What is hydrolysis? Describe hydrolysing agents. Describe the manufacture of any one Active pharmaceutical ingredient by hydrolysis process.

**Q2)** Attempt any five :

**[15]**

- a) Define Active pharmaceutical ingredient, Bulk drug and Fine chemical with example of each.
- b) Enlist various methods of resolution of racemic mixtures. Explain any one method in detail.
- c) Enlist the factors affecting chemical process. Describe any one factor.
- d) Describe the manufacturing method for Metformin.
- e) Explain Unit process of Nitration.
- f) What is esterification. Describe its types.
- g) Describe the manufacturing method for Amlodipine

**P.T.O.**

**Q3) Attempt any two :** [10]

- a) Explain the importance of polymorphism in API.
- b) Mention various approaches for asymmetric synthesis. Explain asymmetric synthesis of Metoprolol.
- c) Outline the GMP guidelines for API with respect to following points.
  - i) Building and Facilities.
  - ii) Documentation and Records.

### SECTION - II

**Q4) Attempt any one question.** [10]

- a) What is a Material safety data sheet? Justify its significance and give a brief description of the contents of a Material Safety Data sheet.

OR

- b) Classify and discuss reactors used in API manufacturing.

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

- a) Discuss physical characteristics of solvents for scale-up.
- b) Explain types of health hazard in API manufacturing
- c) What are expedient route of synthesis and enlist its characteristics.
- d) Explain selection of appropriate IPC in API manufacturing.
- e) Give details of reagent selection in API synthesis.
- f) Discuss any two process variables in API manufacturing.
- g) Give details of homogenous and heterogenous liquid phase reactions.

**Q6) Write short notes on (Any Two) :** [10]

- a) Strategies for route selection in API manufacturing.
- b) Suitable techniques for API purification and isolation.
- c) Green approaches in API manufacturing.
- d) Scale-up in API manufacturing.



Total No. of Questions : 6]

SEAT No. :

**P3001**

[Total No. of Pages :2

**[5452] - 601**

**T.Y. B. Pharmacy**

**3.6.1 - (T) : INDUSTRIAL PHARMACY - II**

**(2013 Pattern) (Semester - VI)**

*Time : 3 Hours]*

*[Max. Marks :70*

*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)** What is the concept of “Pharmaceutical stability” and “thermodynamic stability” in suspensions? Discuss the stability of suspension with the help of DLVO theory. Describe role of electrolytes in stabilizing suspensions. [10]

OR

What are Instabilities in Emulsions? Explain different reasons for Creaming and approaches to stabilize emulsion.

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

- a) Enlist the additives used in formulation of stable Emulsion. Explain in brief about viscosity modifiers.
- b) What is required HLB of an emulsion? How it is calculated?
- c) Describe layout for manufacturing of Emulsion as per GMP.
- d) Describe in detail packaging and labeling instruction of Suspension.
- e) Explain in detail identification test for Emulsion.
- f) What is flocculated and deflocculated suspension? Enlist and explain any one evaluation parameter of suspension.
- g) What is the role of colloid mill in the manufacturings of disperse system.

**Q3)** Write short note on (Any 2). [10]

- a) Multiple emulsion
- b) Factors influencing Cracking/Coalescence of Emulsion.
- c) Acid neutralizing capacity.
- d) Preservation of Emulsion.

**P.T.O.**

## SECTION - II

**Q4)** Give a detail account of various factors affecting permeation of drug through skin. **[10]**

OR

What is the effect of rheology on organoleptic properties of dermatologicals?  
Give detail account of rheological evaluation of dermatological preparations. **[10]**

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

- a) Describe the composition and characteristics of water soluble dermatological bases.
- b) “Methyl paraben and propyl paraben are used in combination as preservatives in dermatologicals” - explain.
- c) What are diffusion cells? What is their use in evaluation of dermatological preparations?
- d) How low energy emulsification is useful in ointment manufacturing?
- e) “Emulsions which undergo phase inversion during manufacturing are found to be more stable” - explain.
- f) Give an account of emulsifiers used in dermatologicals.
- g) What are creams? Describe their types and enlist the ingredients used in their formulation.

**Q6)** Write short note on (Any 2). **[10]**

- a) Anatomy of human skin.
- b) Penetration enhancers.
- c) Empirical evaluation of feel, texture and extrudability of dermatological preparations.
- d) Structure of gels.



Total No. of Questions : 6]

SEAT No. :

**P3002**

**[5452]-602**

[Total No. of Pages : 2

**Third Year B. Pharmacy**  
**PHARMACEUTICAL ANALYSIS - IV**  
**(2013 Pattern) (Semester - VI)**

*Time : 3 Hours]*

*[Max. Marks :70*

*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)** Discuss the principle, instrumentation and developments of Electrophoresis. **[10]**

OR

Discuss various types of mobile phases used in TLC. Write the applications of this technique.

**Q2)** Attempt any Five of the following:

**[5×3=15]**

- a) Write principles of TLC.
- b) Explain "Capacity factor".
- c) Discuss the types of chromatographic papers.
- d) What are column packing techniques?
- e) Discuss the applications of HPTLC.
- f) Discuss factors affecting efficiency of column.
- g) Discuss the pharmaceutical applications of paper chromatography.

**Q3)** Write a note on any two of the following:

**[2×5=10]**

- a) Advantages and disadvantages of HPTLC.
- b) Partition paper Chromatography.
- c) Adsorbents used in HPTLC.
- d) Plate theory of chromatography.

**P.T.O.**

## SECTION-II

**Q4)** Describe in details instrumentation and application of TGA. **[10]**

OR

Describe in brief different techniques of measurement of Radioactivity.

**Q5)** Attempt any Five of the following: **[5×3=15]**

- a) Write about radioactive decay.
- b) Define accuracy. Explain different methods for estimation of accuracy.
- c) Write principle and instrumentation of DTA.
- d) Write about powder method in X-ray diffraction method.
- e) Tagging of compound.
- f) Qualification of an Instrument.
- g) Application of X-ray diffraction method.

**Q6)** Write a note on any two of the following: **[2×5=10]**

- a) Power compensated DSC.
- b) Analytical Method Validation as per USP guideline.
- c) Miller Indices.
- d) Geiger Muller counter.



Total No. of Questions : 6]

SEAT No. :

**P3003**

[Total No. of Pages :2

**[5452] - 603**

**T.Y. B. Pharmacy**

**MEDICINAL CHEMISTRY - II**

**(2013 Pattern) (Semester - VI)**

*Time : 3 Hours]*

*[Max. Marks :70*

*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)** Classify sedative and hypnotics with suitable example from each class. Discuss SAR and mechanism of action of oxazolidinediones. **[10]**

OR

Discuss phase I and phase II reactions in drug metabolism with suitable examples. **[10]**

**Q2)** Answer any Five. **[15]**

- a) Write metabolic pathway for tolbutamide.
- b) Write IUPAC name and structure of caffeine and phenteramine.
- c) Write SAR of barbiturates.
- d) Outline the synthesis of diazepam.
- e) Describe inhalational anaesthetics.
- f) Draw synthesis of procaine.
- g) Classify general anaesthetics with suitable example.

**Q3)** Write any two. **[10]**

- a) Give account on benzodiazepines.
- b) Explain SAR and mechanism of action of thiopentane sodium.
- c) Classify local anaesthetics. Add a note on local anaesthetics containing ester linkage.
- d) Write a note on oral anti-hyperglycemic agent.

**P.T.O.**

## SECTION - II

**Q4)** What are anti-convulsants. Enlist type and give mechanism of action of each class of anti-convulsant. **[10]**

OR

Define antidepressant drugs with their mechanism of action. Classify them, giving example with structure of each class and add synthesis of amitriptyline. **[10]**

**Q5)** Answer any five. **[15]**

- a) Outline the synthesis of amantadine.
- b) Classify CNS stimulants with suitable example.
- c) Give SAR of butyrophenone.
- d) Add a note on anti-migraine agents.
- e) Write a brief note on analeptic drugs.
- f) Drugs used in the treatment of parkinson's disease.
- g) Give synthesis of haloperidol.

**Q6)** Write Notes on any two of the following. **[10]**

- a) Write a note on tricyclic anti-depressant drugs.
- b) What do you mean by organ function test agents? Classify with suitable structure.
- c) Psychotropic agents.
- d) Write a note on radio-opaque agent.



Total No. of Questions : 6]

SEAT No. :

**P3004**

[5452]-604

[Total No. of Pages : 2

**T.Y. B. Pharm.**

**PHARMACOLOGY - III  
(2013 Pattern) (Semester - VI)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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)** Discuss Pharmacology of alcohol. Write note on the treatment of alcoholism. **[10]**

OR

Classify anti-Parkinsonian drugs with examples. Discuss Pharmacology of levodopa.

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

- a) Describe the stages of general anesthesia.
- b) Give an account of intravenous anesthetics.
- c) Write a short note on selective serotonin reuptake inhibitors.
- d) Discuss the term anxiety and add note on anxiolytics.
- e) Discuss mechanism of action, therapeutic uses of Lithium carbonate.
- f) Write uses and adverse effects of tricyclic antidepressants.
- g) Classify antiepileptic drugs with example of each class.

**Q3)** Write short note on (Any 2) **[10]**

- a) Alzheimer's disease.
- b) Benzodiazepines
- c) MAO inhibitors
- d) Techniques of administration of local anesthetics

**P.T.O.**

**SECTION - II**

**Q4)** Classify NSAIDS and discuss pharmacology of any one drug. **[10]**

OR

Write Pharmacological account of emetics and anti-emetics.

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

- a) Write MOA, Adverse Effects and Clinical uses of Aspirin.
- b) Write a short note on pharmacotherapy of diarrhea.
- c) Classify H<sub>2</sub> receptor antagonists. Give their uses.
- d) Write a note on mucolytics.
- e) How would you treat the infection caused by H. pylori.
- f) What is mean by gout? Classify anti gout drugs.
- g) Write a note on morphine antagonists.

**Q6)** Write short note on (Any 2) **[10]**

- a) Pharmacotherapy of cough
- b) COPD
- c) Opioid analgesics
- d) Rheumatoid arthritis



Total No. of Questions : 6]

SEAT No. :

**P3005**

[Total No. of Pages :2

**[5452] - 605**

**T.Y. B. Pharm.**

**NATURAL PRODUCTS CHEMISTRY**

**(2013 Pattern) (Semester - VI)**

*Time : 3 Hours]*

*[Max. Marks :70*

*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)** Attempt any one of the following. **[10]**

- a) What do you mean by biosynthetic pathway? Enlist different techniques for elucidation of biosynthetic pathway. Add a note on Tracer techniques.
- b) Explain the role of spectroscopy in NPC. Add a note on Principle and applications of NMR.

**Q2)** Attempt any five of the following. **[15]**

- a) Explain Woodward-Fischer's rule.
- b) Write significance of Optical rotation in characterization of natural products.
- c) What is R<sub>f</sub> value? Application of HPTLC.
- d) Explain different rates of reactions.
- e) Explain Circular dichroism.
- f) Explain the applications of UV.
- g) What are grafts and mutants?

***P.T.O.***

**Q3)** Attempt any two. **[10]**

- a) Write a detailed note on role of natural products in drug discovery.
- b) Describe structural elucidation of flavonoids by spectral methods.
- c) Give the principle and applications of Gas chromatography.
- d) Explain Ring formation reaction for functional group analysis.

### **SECTION - II**

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

- a) Define marine drugs. Add a detailed note on Cardio vascular marine drugs.
  
- b) Elaborate the role of natural products in new drug discovery.

**Q5)** Attempt any five of the following. **[15]**

- a) Define nutritive sweeteners and taste modifiers.
- b) Write the B.S, C.C, uses of liquorice.
- c) Write a short note on stevia.
- d) What is the difference between nutritive and non-nutritive sweeteners.
- e) Give the classification of natural colorants.
- f) Write a short note on henna.
- g) Write the B.S, C.C, uses of annatto.

**Q6)** Attempt any two. **[10]**

- a) Explain in detail serendipity berry as sweeteners.
- b) Write a note on strategies on new drug discovery.
- c) Describe drugs acting on Cardio Vascular System from marine source.
- d) Write a note on Beet and Indigo dye.



Total No. of Questions : 6]

SEAT No. :

**P3006**

[Total No. of Pages : 2

**[5452]-606**

**T.Y. B. Pharmacy**

**BIO ORGANIC CHEMISTRY & DRUG DESIGN  
(2013 Pattern) (Semester - VI) (Elective - II)**

*Time :3 Hours]*

*[Max. Marks : 70*

*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 side indicate full marks.*

**SECTION - I**

**Q1)** What is molecular recognition? Explain the types and process of molecular recognition emphasizing drug target interactions involved in molecular recognition. **[10]**

OR

Explain physiological role of cyclooxygenase 1 and 2 and its relevance in drug design. Comment on their inhibitors.

**Q2)** Attempt any five of the following. **[15]**

- a) Explain biochemical role of tyrosine kinase and its relevance in drug design.
- b) Explain proximity effect in drug design.
- c) Elaborate on MAO inhibitors
- d) Write a note on chain terminators in DNA strand breaking.
- e) What is molecular adaptation?
- f) Write a note on Carbonic anhydrase.
- g) Write a note on antisense therapy.

**Q3)** Attempt any two of the following: **[10]**

- a) Discuss the mechanism of intercalation of DNA with example.
- b) Write a note on adrenergic receptors and its agonist.
- c) Describe the mechanism of alkylating agents targeting the nucleic acid.
- d) Explain the structure and physiological role of Cholinergic receptor.

***P.T.O.***

## SECTION - II

**Q4)** Explain process of Structure-based Drug Design with suitable example. [10]

OR

Write about history, types and applications of QSAR

**Q5)** Attempt any five of the following. [15]

- a) Explain types of drug design
- b) Explain lipophilic substituent constant and partition coefficient as QSAR parameters.
- c) Write a note on enzyme inhibition.
- d) Discuss example of mutual prodrug.
- e) Explain Hammett constant ( $\sigma$ ) and give its applications.
- f) Explain applications of Pharmacophore model in drug design.
- g) Write about software used in molecular docking.

**Q6)** Answer any two of following. [10]

- a) Write a note on soft drugs
- b) Write a note on virtual screening
- c) Explain ligand-based drug designing
- d) Write a note on lead discovery



Total No. of Questions : 6]

SEAT No. :

**P3007**

[Total No. of Pages : 2

**[5452]-607**

**T. Y. B. Pharmacy**

**PHARMACEUTICAL BIOTECHNOLOGY  
(2013 Pattern) (Semester - VI) (Elective - II)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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)** Explain basic steps of genetic engineering and elaborate on tools of genetic engineering. **[10]**

OR

Define nucleic acid blotting. Discuss in detail different methods of nucleic acid blotting.

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

- a) Define cloning vector. Enlist different types of cloning vectors.
- b) Enlist methods of gene transfer and explain any one of them.
- c) Discuss in short expression vector.
- d) Explain Applications of pharmaceutical biotechnology.
- e) What do you mean by site directed mutagenesis?
- f) Draw neat and labeled diagram of shuttle vector.
- g) Explain in detail DNA fingerprinting.

**Q3)** Write short note on (any 2) **[10]**

- a) Gene synthesis
- b) Restriction endonuclease
- c) c-DNA library
- d) DNA hybridization

**P.T.O.**

**SECTION - II**

**Q4)** Explain in detail down stream processing. **[10]**

OR

Explain the production of any one antibiotic by fermentation technology.

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

- a) Explain different applications of transgenic animals.
- b) Enlist advantages and disadvantages of enzyme immobilization.
- c) Discuss in short production of interferons.
- d) What is hybridoma technology?
- e) Draw neat and labeled diagram of typical fermenter.
- f) Explain enzyme immobilization by covalent bonding.
- g) Define and classify different types of fermenters.

**Q6)** Write short note on (Any 2) **[10]**

- a) Applications of enzyme immobilization
- b) Human gene therapy
- c) Monoclonal antibodies
- d) Germ plasm storage



Total No. of Questions : 6]

SEAT No. :

**P3009**

**[5452]-702**

[Total No. of Pages : 2

**Fourth Year B. Pharm.  
PHARMACEUTICAL ANALYSIS - V  
(2013 Pattern) (Semester - VII) (Theory)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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)** Describe in details, instrumentation and applications of NIR technique. [10]

OR

Describe advantages, instrumentation and applications of FTIR technique.

**Q2)** Attempt any five of the following. [15]

- a) Compare applications of Raman and IR techniques.
- b) What are the advantages of Raman techniques?
- c) Compare Principle and advantages of SEM and TEM techniques.
- d) Explain contribution of SEM technique in scientific studies.
- e) Explain fingerprint IR region.
- f) Explain use of molecular vibrations in IR interpretation.
- g) Explain advantages of FTIR technique.

**Q3)** Attempt any two of the following. [10]

- a) Explain characteristic IR bands of organic acid compounds.
- b) Discuss dispersive IR instrument.
- c) Discuss IR solid sample handling in details.
- d) Discuss in brief FT Raman.

**P.T.O.**

## SECTION - II

**Q4)** Discuss the instrumentation, working and applications of Flash Chromatography. **[10]**

OR

Describe the different sample handling techniques used in Gas Chromatography(GC). Give the applications of GC.

**Q5)** Attempt any five of the following. **[15]**

- a) Write the principle of Flash Chromatography.
- b) Write the significance of Van Deemter equation.
- c) How derivatization is carried out in GC?
- d) Give the principle of Atomic Emission Spectroscopy.
- e) Discuss the instrumentation of Atomic Emission Spectroscopy.
- f) Discuss ideal characteristics of detectors used in GC?
- g) Write the principle of Super Critical Fluid Chromatography.

**Q6)** Write a note on any two of the following. **[10]**

- a) Stationary and Mobile phases used in GC.
- b) Flame Ionization and Differential Thermal Conductivity Detector.
- c) Instrumentation of Super Critical Fluid Chromatography.
- d) Advantages and applications of Super Critical Fluid Extraction.



Total No. of Questions : 6]

SEAT No. :

**P3010**

[Total No. of Pages : 2

**[5452]-703**

**F. Y. B. pharm.**

**MEDICINAL CHEMISTRY - III**

**(2013 Pattern) (Semester - VII)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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)** a) Give the classification of opioids with examples. Give an account of morphine class of opioids as analgesic, including the chemistry and SAR. **[10]**

OR

b) Give the chemistry of histamine. Classify the histamine receptor antagonists. Add a note on H<sub>2</sub> receptor antagonists.

**Q2)** Solve any five questions (each question carries 3 marks) : **[15]**

- a) Give the structure and Mechanism of action diclofenac and diphenhydramine.
- b) Sketch the scheme of synthesis of ibuprofen.
- c) Classify H<sub>1</sub> receptor antihistaminics with examples.
- d) Write the SAR of prostaglandins
- e) Write a note on histamine receptors.
- f) Classify NSAIDs with examples and mechanism of action.
- g) Give the biosynthesis of eicosanoids.

**Q3)** Write short note on any two (each question carries 5 marks) : **[10]**

- a) Sketch the scheme of synthesis of Paracetamol and Promethazine.
- b) Write a note on opioid receptors.
- c) Give the SAR for glucocorticoids as anti-inflammatory agents.
- d) Give the chemistry and SAR of salicylates as NSAIDs.

**P.T.O.**

## SECTION - II

**Q4)** a) Discuss the mechanism of action and SAR of proton pump inhibitors. What is the advantage of PPIs over H<sub>2</sub> receptor antagonists. [10]

OR

b) Define emesis. Classify the antiemetic agents with examples. Give their mechanism of action and uses.

**Q5)** Solve any five questions (each question carries 3 marks) : [15]

- a) Give the structure and mechanism of action of salmeterol and omeprazole.
- b) Give the scheme of synthesis of Guaifenesin.
- c) Give an account of antisecretory drugs.
- d) Classify antiasthmatic drugs with examples, mechanism of action and SAR.
- e) Classify antidiarrhoeal agents with examples, mechanism of action and SAR.
- f) Give an account of laxatives with mechanism of action.
- g) Classify with examples the drugs used in treatment of Irritable bowel syndrome.

**Q6)** Write short note on any two (each question carries 5 marks) : [10]

- a) Prokinetic drugs.
- b) Antispasmodics.
- c) Expectorants and antitussives.
- d) Anti-inflammatory steroids for asthma treatment.



Total No. of Questions :6]

SEAT No. :

[Total No. of Pages : 2

**P3011**

**[5452]-704**

**Fourth Year B. Pharmacy  
PHARMACOLOGY - IV  
(2013 Pattern) (Semester-VII)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Attempt all questions.*
- 2) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Classify antibiotics according to mechanism of action. Explain in detail mode of action, therapeutic uses, adverse effects and drug interactions of tetracyclines. **[10]**

OR

Classify antineoplastic agents with exmple. Explain mechanism of action, therapeutic uses, adverse reactions of alkylating agents. **[10]**

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

- a) Classify the drugs used in the treatment of leprosy.
- b) Explain mechanism of action and adverse effects of chloramphenicol.
- c) Classify anthelmintics with examples.
- d) Explain mechanism of action and therapeutic uses of sulfonamides.
- e) Classify antiviral agents with examples.
- f) Why tuberculosis requires multidrug therapy?
- g) Explain mechanism of action and adverse effects of Penicillins.

**Q3)** Write short notes on ANY TWO : **[10]**

- a) Immunomodulators
- b) Drugs used in treatment of urinary tract infections
- c) Pharmacotherapy of malaria
- d) Cephalosporins

***P.T.O.***

## SECTION - II

**Q4)** Classify drugs used in the treatment of congestive cardiac failure. Explain mechanism of action, pharmacological actions, therapeutic uses and adverse effects of cardiac glycosides. **[10]**

OR

Define diuretic. Explain mechanism of action, therapeutic uses and adverse effects of thiazide diuretics. **[10]**

**Q5)** SOLVE ANY FIVE : **[15]**

- a) Enlist drugs used in treatment of cardiac arrhythmia.
- b) What is safety pharmacology? Explain its significance.
- c) Explain mechanism of action and adverse effects of Atorvastatin.
- d) What are therapeutic uses of nitrates?
- e) Classify antihypertensive agents with examples.
- f) Explain mode of action and adverse effects of Losartan.
- g) Why aspirin is used in myocardial infarction?

**Q6)** Write short note on ANY TWO : **[10]**

- a) Anticoagulants
- b) Role of antioxidants in various disorders
- c) Antidiuretics
- d) Bile acid sequestrants



Total No. of Questions : 6]

SEAT No. :

**P3012**

[Total No. of Pages : 2

**[5452]-705**

**Fourth Year B. Pharmacy**

**475 : NATURAL DRUG TECHNOLOGY**

**(2013 Pattern) (Semester - VII) (Theory)**

*Time :3 Hours]*

*[Max. Marks : 70*

*Instructions to candidates:*

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

**SECTION - I**

**Q1)** Explain Ayurveda as Traditional System of medicine with special Emphasis on Tridosha theory. **[10]**

OR

Explain Principle and Applications of DNA Fingerprinting in plants. **[10]**

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

- a) Describe the Method of Preparation of Asava.
- b) How to Develop a Crude Drug Monograph?
- c) Describe the Role of Cultivation and Harvesting Technology in Quality Assurance.
- d) Comment on Principle and Treatment Aspects of Unani System.
- e) Explain in Short Currently Practiced Approaches in Cultivation.
- f) Emphasize on Vatika as ayurvedic Dosage form.
- g) How crude drugs can be protected from Mould and Bacterial Attack?

**Q3)** Write a Note on (Any Two) **[10]**

- a) Evaluation of 'Bhasma'
- b) Post Harvesting Storage of Crude Drugs
- c) WHO Guidelines for 'Good Agricultural and Collection Practices'
- d) Difficulties and Limitations in Standardization of Herbal Drugs.

**P.T.O.**

## SECTION - II

**Q4)** What are Biofuels? Explain in detail about their Method of Preparation. [10]

OR

Explain Natural Products as Oral Bioavailability Enhancers. [10]

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

- a) Classify. Herbal Dietary Supplements.
- b) Describe Evaluation of Skin care Cosmetics.
- c) How Inorganic Mineral Supplements are Important?
- d) Describe the Importance of Carotenoids.
- e) Emphasize on Hide Glue Derived from Gelatin.
- f) Give Pharmacognostic account of Rotenone.
- g) Role of Dietary fibres in Human Health.

**Q6)** Write a Note on (Any TWO) [10]

- a) Resveratrol and Garlic as Dietary Supplements.
- b) Hair Care Cosmetics.
- c) Neem as an Effective Natural Pesticide.
- d) Novel Drug Delivery Systems of Herbal Drugs.



Total No. of Questions : 6]

SEAT No. :

**P3013**

**[5452]-706**

[Total No. of Pages : 2

**Fourth Year B. Pharmacy**

**4.7.6 BIOPHARMACEUTICS AND PHARMACOKINETICS**

**(2013 Pattern) (Semester - VII)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All Questions are Compulsory.*
- 2) *Answer 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)** Enlist factors influencing absorption of drugs. Discuss patient related factors in detail. **[10]**

OR

Discuss various physiological barriers to distribution of drugs .Discuss blood brain barrier in detail.

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

- a) Blood placental barrier.
- b) Mammary excretion of drug.
- c) Non-renal routes of drug excretion.
- d) Factors affecting protein binding of drugs.
- e) Absorption via transdermal route.
- f) Effect of food on absorption drug.
- g) Passive diffusion of drug.

**Q3)** Write short note on (Any 2) **[10]**

- a) Apparent volume of Distribution and factors affecting.
- b) Phase I reactions in biotransformation of drugs.
- c) Active transport of drugs.
- d) Importance of BCS classification of drug.

**P.T.O.**

## SECTION-II

**Q4)** Define Bioavailability and Bioequivalence and explain single verses multiple dose study. Give a note on BIBD. **[10]**

OR

What is one compartmental open model. Give assessment of parameters by IV Bolus administration.

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

- a) What is wash out period.
- b) How bioavailability of poorly water soluble drug is increased.
- c) What is significance of compartmental analysis.
- d) What is loading dose.
- e) Explain Non compartmental analysis.
- f) Define and explain in short  $C_{max}$  and  $t_{max}$ .
- g) What are the advantages of urinary data over plasma data.

**Q6)** Write short note on ( Any 2). **[10]**

- a) Estimation of  $k_a$ .
- b) Biowaivers.
- c) Absolute & relative bioavailability.
- d) AUC.



Total No. of Questions : 6]

SEAT No. :

**P3014**

**[5452]-707**

[Total No. of Pages : 2

**Final Year B. Pharmacy**

**4.7.7(T) PHARMACEUTICAL JURISPRUDENCE**

**(2013 Pattern) (Semester - VII)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All Questions are Compulsory.*
- 2) *Answer 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) a)** Define drug Inspector. Explain the procedure of drug inspector for taking samples of drugs and cosmetics. **[10]**

OR

b) State the constitution and functions of drugs technical advisory board (DTAB) as per drugs and cosmetics Act, 1940 & Rules 1945.

**Q2) Answer the following (any 5 )** **[15]**

- a) Explain - "procedure for registration of pharmacist" as per pharmacy Act, 1948.
- b) Give the objective & explain the formula to calculate the retail price of a formulation as per DPCO.
- c) Give any two offences and its corresponding penalties given under pharmacy Act, 1948.
- d) Give the objectives of food safety and standards Act, 2011.
- e) Define- "drugs" under drugs & magic remedies Act, 1954.
- f) State the objectives of prevention of cruelty to animal Act, 1960.
- g) Define: i) Schedule-Y ii) Schedule-F.

**Q3) Write short note on (Any 2 )** **[10]**

- a) Give the objective, constitution and functions of consumer forum as per the consumer protection Act, 1986.
- b) Illicit traffic given under narcotic drugs & psychotropic substances Act, 1985.
- c) Conditions for repacking licenses .
- d) Manufacturing of Ayurvedic drugs.

**P.T.O.**

## SECTION-II

**Q4)** What are the criteria of patenting an invention? Which types of inventions are generally considered non patentable world wide? Why? **[10]**

OR

What is Hatch waxman Act? What is its advantage to the generic pharma companies?

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

- a) Where are the patent offices located in india? what are their jurisdictions?
- b) Differentiate between per grant and post grant opposition.
- c) What is patent certification. what is the significance of pare IV filing?
- d) what is patent infringement? How does the court decide infringement? What remedies are available for the petent owner in case of infringement?
- e) What are process patents and product patents? when were product patents introduced in India?
- f) Explain what is ordinary patent application, convention patent application and provisional patent application.
- g) Explain what was the mail box provision and Exclusive marketing rights. in which amendment of the Indian patent Act this provision was introduced?

**Q6)** Write short note on ( Any 2 ). **[10]**

- a) Significance of section 3d of Indian patent Act.
- b) Compulsory licensing.
- c) TGA.
- d) Geographical indicators.



Total No. of Questions : 6]

SEAT No. :

**P3015**

**[5452]-801**

[Total No. of Pages : 2

**Fourth Year B. Pharmacy**

**4.8.1 ADVANCED DRUG DELIVERY SYSTEM**

**(2013 Pattern) (Semester - VIII)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*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)** Explain formulation development and evaluation of transdermal drug delivery system in detail. **[10]**

OR

Differentiate between controlled release and sustain release drug delivery system, Prerequisites of drug candidates, explain dissolution based controlled drug delivery system.

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

- a) Give an account on intrauterine drug delivery system.
- b) What are probiotics write applications of probiotics.
- c) What are liposomes, enlist different types of liposomes.
- d) Write and explain the formula for dose calculation of controlled drug delivery system.
- e) Write on Parental implants.
- f) Write about osmotic pumps.
- g) Factors affecting Iontophoretic drug delivery system.

**Q3)** Write short note on (Any 2): **[10]**

- a) IUDs.
- b) Penetration enhancers.
- c) Mucosal drug delivery systems.
- d) Sonophoresis.

**P.T.O.**

## SECTION-II

**Q4)** What is meant by microencapsulation? Explain how chemical encapsulation occurs by coacervation or phase separation method. **[10]**

OR

Explain Aerosol Components and factors affecting its selection.

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

- a) Advantages of intranasal Aerosols.
- b) Advantages and disadvantages of meter dose inhalers.
- c) Explain the concept of Optimization.
- d) Describe fundamental concept of Aerosols.
- e) Enlist the polymers used in different methods of microencapsulation.
- f) Enlist the types of Aerosols system.
- g) Explain Factorial Design.

**Q6)** Write short note on (Any 2): **[10]**

- a) Describe polymer - polymer incompatibility method of Microencapsulation.
- b) Quality Control test of Aerosols.
- c) How to evaluate Microencapsulation.
- d) Describe suspension system of Aerosols.



Total No. of Questions : 6]

SEAT No. :

[Total No. of Pages :2

**P3016**

**[5452] - 802**

**Fourth Year B. Pharmacy**  
**4.8.2 : COSMETIC SCIENCE**  
**(2013 Pattern) (Semester - VIII)**

*Time : 3 Hours]*

*[Max. Marks :70*

*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)** Define cosmetics. Classify skin cosmetics. Give an account of formulation and evaluation aspects of Vanishing cream. **[10]**

OR

Explain in detail about various excipients used in manufacturing of cosmetics.

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

- a) Describe in brief about bath oils.
- b) Discuss about powder rouges.
- c) Discuss formulation aspects of cold cream.
- d) Differentiate between cosmetics and drug formulation.
- e) Discuss formulation aspects of cleansing cream.
- f) Discuss in brief about quality of water in cosmetic industry.
- g) Discuss about the formulation of after shave lotion.

**Q3)** Write short note on (Any two). **[10]**

- a) Face powders.
- b) Sunscreen preparations.
- c) Microbial control in cosmetic manufacturing.
- d) Anti ageing and anti wrinkle creams.

**P.T.O.**

## SECTION - II

**Q4)** Discuss in detail about components, formulation development, manufacturing and evaluation of shampoos. **[10]**

OR

What are dentifrices? Explain in detail about components of tooth paste. Add a note on evaluation of tooth powder.

**Q5)** Answer the following (Any Five). **[15]**

- a) Explain significance of diluent: solvent ratio in nail lacquer.
- b) Discuss various types of hair coloring systems.
- c) What are depilatories? Write about ingredients used in depilatories.
- d) Write in brief about various nail care products.
- e) Compare & contrast cosmetics and cosmeceuticals.
- f) How skin of infant is different from that of adult skin. Thus enlist functional requirements for baby product.
- g) Discuss about nail lacquer remover.

**Q6)** Write short note on (Any Two). **[10]**

- a) Chemical depilatories.
- b) Antioxidants as cosmeceuticals.
- c) Baby talcum powder.
- d) Hair conditioners.



Total No. of Questions : 6]

SEAT No. :

**P3017**

[5452]-803

[Total No. of Pages : 2

**Final Year B. Pharmacy**  
**PHARMACEUTICAL ANALYSIS - VI**  
**(2013 Pattern) (Semester - VIII)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Answer the following (Any 1) **[10]**

What is chemical shift? Elaborate the factors affecting chemical shift.

OR

Discuss the principle involved in Proton NMR and the instrumentation of conventional 300 MHz NMR instrument.

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

- a) Differentiate between acetone and acetaldehyde by  $^1\text{H-NMR}$ .
- b) Shielding and Deshielding.
- c) Discuss the peak area integration method in Proton NMR.
- d) Reference standards used in  $^1\text{H-NMR}$  spectroscopy.
- e) Significance of coupling constant 'J'.
- f) Applications of Ion Exchange Chromatography.
- g) Rules governing multiplicity of  $^1\text{H-NMR}$  spectra.

**Q3)** Write short note on (Any 2) **[10]**

- a) ESR
- b) Classify Ion Exchange Resin
- c) Capillary electrophoresis
- d) Elucidate structure of organic compound from following data  
Mol. wt. –58.  
NMR
  - i) 9.77  $\delta$ , 2 squares, singlet
  - ii) 2.5  $\delta$ , 4 squares, quartet
  - iii) 1.2  $\delta$ , 6 squares, triplet

**P.T.O.**

## SECTION - II

**Q4)** Answer the following(Any 1) **[10]**

Elaborate different system suitability parameters with their respective formula.

OR

Explain principle of Mass spectroscopy. Discuss TOF and Quadrapole mass analyzers.

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

- a) Internal standardization technique for quantitation in column chromatography.
- b) Draw neat and well labelled diagram of single focusing mass spectrometer.
- c) Define generation of metastable ion in field free region.
- d) Resolution in mass spectroscopy.
- e) Distinguish between Isocratic and Gradient elution.
- f) Nitrogen rule in mass spectrometry.
- g) Discuss the advantages of UPLC over HPLC.

**Q6)** Write short note on (Any 2) **[10]**

- a) Applications of HPLC
- b) Fast Atom Bombardment (FAB) in mass spectrometry
- c) Chemical ionization in mass spectrometry
- d) Discuss double focusing mass analyzer.



Total No. of Questions : 6]

SEAT No. :

**P3018**

[Total No. of Pages :2

**[5452] - 804**

**Final Year B. Pharm.**

**MEDICINAL CHEMISTRY - IV**

**(2013 Pattern) (Semester - VIII)**

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** What are Antiviral Agents? Classify them with examples. Add a note on Interferons. **[10]**

OR

What are Anti-neoplastic agents? Classify them with example of each class. Write in brief about Antimetabolites. **[10]**

**Q2)** Answer the following (any five) **[15]**

- a) Give the synthesis of Sequinavir.
- b) Give the SAR of Ethambutol.
- c) What is the role of pKa in the development of Sulfonamides.
- d) Write a note on Anti-leprotic Agents.
- e) Give the synthesis of Albendazole.
- f) Write a note on Trypanosomicidal drugs.
- g) Give SAR of 4-aminoquinolines as Antimalerials.

**Q3)** Write short notes on any two. **[10]**

- a) Anti-amoebic drugs.
- b) Azoles as anti-fungal drugs.
- c) Chemistry and SAR of Fluoroquinolones.
- d) Alkylating agents.

***P.T.O.***

## SECTION - II

**Q4)** Define Antibiotics. Give the chemical classification of Antibiotics with examples. Add a note on Acid resistant Penicillines. **[10]**

OR

What are estrogens? Classify them with examples. Give SAR of estrogens Give therapeutic uses of Estrogens and Antiestrogens. **[10]**

**Q5)** Answer the following (any five) **[15]**

- a) Give the scheme for synthesis of Amoxicillin Trihydrate.
- b) Write in brief about Antithyroid drugs.
- c) Give the synthesis of PAS.
- d) How Tetracycline molecule is inactivated in strong acid and strong base?
- e) Explain with examples Anabolic steroids.
- f) Give structure, MoA and use of Clavulanic Acid.
- g) Give the synthesis of Cefadroxil.

**Q6)** Write notes on any Two. **[10]**

- a) Discuss in brief about Macrolide.
- b) Androgens.
- c) SAR and MoA of Chloramphenicol.
- d) Give SAR and MoA of Aminoglycosides.



Total No. of Questions : 6]

SEAT No. :

[Total No. of Pages : 2

**P3019**

**[5452]-805**

**Fourth Year B. Pharm.  
PHARMACOLOGY - V  
Including Biostatistics  
(2013 Pattern) (Semester-VIII)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Answers to the two sections should be written in two 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)** Define and classify Drug Interactions and write a note on pharmacodynamic drug interaction with relevant examples. **[10]**

OR

Classify Adverse Drug Reactions (ADR) with examples. Discuss in brief about reporting of ADR

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

- a) What are beneficial drug -drug interactions? Justify your answer with example.
- b) What are the pre-disposing factors for Adverse Drug Reactions?
- c) What are the objectives of pharmacovigilance?
- d) Enlist the categories of drugs needs to be monitored therapeutically.
- e) Give the role of pharmacist in Therapeutic Drug Monitoring.
- f) What are different types and sources of stem cells?
- g) Enlist different Liver function tests with their significance.

**Q3)** Write notes on (Any Two). **[10]**

- a) Therapeutic drug monitoring.
- b) Gene therapy.
- c) Drug induced diseases.
- d) Kidney Function Tests.

**P.T.O.**

## SECTION-II

**Q4)** Write in brief about objectives, compositions, responsibilities and Working of pharmacy and therapeutic committee in hospital pharmacy. **[10]**

OR

Explain in brief about types and phases of clinical trials.

**Q5)** Solve any Five. **[15]**

- a) Write the advantages and disadvantages of inpatient and outpatient pharmacy.
- b) Define, protocol, comparative study and controlled study.
- c) Explain the reasons for patient non compliance.
- d) Write the qualification and responsibilities of investigator in clinical trials.
- e) Discuss special consideration in informed consent.
- f) Explain unit dose distribution system with advantages.
- g) Write ethical consideration in Nuremberg code.

**Q6)** Write short notes on (any two) **[10]**

- a) Role of hospital pharmacist in hospital committees.
- b) Schedule y
- c) Hospital formulary
- d) Blinded study



Total No. of Questions : 6]

SEAT No. :

**P3020**

[5452]-806

[Total No. of Pages : 2

**Fourth Year B. Pharmacy**

**NATURAL PRODUCTS: COMMERCE, INDUSTRY & REGULATIONS**

**(2013 Pattern) (Semester - VIII)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answer 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]**

Write in detail about the size, turnover, domestic and international share of Indian Herbal Drug Industry.

OR

Write an exhaustive note on global market size with respect to sale of nutraceuticals and sweeteners.

**Q2)** Solve any five :

**[15]**

- a) Write a note on major herbs and herbal extracts exported from India.
- b) Write in brief about the demand and supply position of herbal drug formulation.
- c) Write the significance of biofuels in national economy.
- d) Add a note on export and import of traditional medicinal products.
- e) Discuss the regulatory requirements for herbal drug manufacturing.
- f) Add a note on commerce of herbal cosmetics.
- g) Comment about the documents required for herbal drug mfg. license.

**P.T.O.**

**Q3) Write notes on any two :** [10]

- a) Add a note on domestic and global market for OTC products.
- b) Write in detail about domestic market size of spices and condiments.
- c) Comments on leading manufacturers of herbal drugs in India.
- d) Write a note on Industry oriented R&D Institutes.

**SECTION - II**

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

Explain the different ways by which herbal preparation causes toxicity. Add on pharmacokinetic and pharmacodynamics of interaction.

OR

Define and classify plant allergens. Explain in detail about the method of preparation of allergenic extracts.

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

- a) Add a note on special precautions in Geriatric patients for herbal therapy.
- b) Discuss on contactant allergens
- c) Brief on toxic reactions of Canabidiols.
- d) Write in brief about the need of Pharmacovigilance.
- e) Write a toxicity and drug interaction of Digitalis.
- f) Describe the primary exposure in allergy.
- g) Describe the role of pharmacist in Pharmacovigilance.

**Q6) Write notes on any two:** [10]

- a) Meaning and significance of Pharmacovigilance of herbal medicines.
- b) Cinchona toxicity and interaction.
- c) Toxicity of St. Jhon's wort.
- d) Application of allergens in diagnosis & treatment.



Total No. of Questions : 6]

SEAT No. :

**P3021**

[Total No. of Pages : 2

**[5452]-807**

**F .Y. B.Pharm.**

**QUALITY ASSURANCE TECHNIQUES**

**(2013 Pattern) (Semester-VIII)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Discuss the quality control of raw materials, pharmaceutical process & finished products. **[10]**

OR

What are QA and QC? write the difference between QA and QC.

**Q2)** Attempt any five of the following. **[15]**

- a) Write significance of Quality Audits.
- b) Explain PQ.
- c) Discuss sources of variation.
- d) Explain prospective validation
- e) Write the advantages of VMP.
- f) Discuss QC of finished products.
- g) Explain stages of validation.
- h) Discuss guidelines for cleaning method validation.

**Q3)** Write short notes on any two of the following: **[10]**

- a) Concurrent validation.
- b) Statistical quality control.
- c) QBD.
- d) DQ.

**P.T.O.**

## SECTION - II

**Q4)** Discuss Quality management System.

**[10]**

OR

Explain the role of QA and discuss the importance of Documentation.

**Q5)** Attempt any five of the following.

**[15]**

- a) Write the SOP for personal hygiene in pharmaceutical manufacturing plant.
- b) Explain requirement of qualification and experience of personnel in cGMP.
- c) Explain accelerated testing in stability testing of new drug.
- d) Discuss about principal area of manufacturing plant.
- e) Explain Expiration dating
- f) State the importance of SOP.
- g) Discuss maintenance of equipment log.

**Q6)** Write short notes on any two of the following:

**[10]**

- a) Harmonization of GMP.
- b) Batch production and control records.
- c) Site master file.
- d) Production record Review.

