

Total No. of Questions : 6]

SEAT No. :

**P1608**

[Total No. of Pages : 3

**[5345]-101**

**First Year B. Pharmacy (Semester - I)**

**1.1.1T PHARMACEUTICS - I**

**(2013 Pattern)**

*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]**

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

OR

Write the history of pharmacy profession in India, also write a note on Scope of Formulation Development and Hospital pharmacy.

**Q2)** Attempt any Five :

**[15]**

- a) Write the preservatives used in liquid oral formulations
- b) Write the scope of pharmaceutical engineering.
- c) What is Pharmacopoeia? Add a note on Indian Pharmacopoeia
- d) Describe Siddha and Unani as an alternate system of medicine.

**P.T.O.**

- e) Write the principles of Ayurveda.
- f) Write the different sources of drug with suitable examples
- g) What are excipients? Explain the different flavours used in pharmaceuticals.

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

- a) Career opportunities after pharmacy graduation.
- b) British Pharmacopoeia.
- c) Principles of Homoeopathy.
- d) Pharmacy code of ethics.

### **SECTION - II**

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

Differentiate between Quality control and Quality Assurance, explain cGMP requirement for pharmaceuticals

OR

Define preformulation, discuss physicochemical properties of drug for preformulation study.

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

- a) Why preservatives are not added in Simple Syrup I.P.
- b) Write formulation ingredients, procedure and direction for Concentrated Dill Water I.P.
- c) What are elixirs? Write the formulation ingredients used in any one elixir preparation.
- d) Give procedure for determination of specific gravity of solutions.

- e) Explain any one method for preparation of Aromatic Water.
- f) Discuss in brief Enema.
- g) Write the composition of any one mouth wash preparation.

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

**[10]**

- a) Solvents used in pharmaceutical solutions.
- b) ENT preparations.
- c) Medicated syrups.
- d) Solubility study in preformulation.



Total No. of Questions : 6]

SEAT No. :

P1609

[Total No. of Pages : 3

[5345]-102

F.Y. B. Pharm.

MODERN DISPENSING PRACTICES

(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) *Figures to the right indicate full marks.*
- 3) *All questions are compulsory.*

**SECTION - I**

**Q1)** Attempt any one :

**[10]**

- a) Explain good compounding and dispensing practices.
- b) Define prescription and explain in detail responding or handling to prescription.

**Q2)** Answer any five in short :

**[15]**

- a) Explain use of pictograms in dispensing.
- b) Describe in brief patient Medication Record.
- c) Explain in brief storage conditions for medicines.
- d) Explain labeling of dispensed medicines.
- e) How will you prepare 300 ml 25% alcohol from 70% alcohol?
- f) In what proportions 4 % and 10 % zinc oxide ointments will be mixed to prepare 30 gm of 6% ointment.
- g) Differentiate between compounding and dispensing.

**P.T.O.**

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

- a) Stability of pharmaceutical products.
- b) Steps in compounding.
- c) Selection of container for dispensing.
- d) Pricing of prescription.

**SECTION - II**

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

- a) Explain organization, structure and design of retail pharmacy with the legal requirement and forms to obtain FDA license.
- b) Define Posology and explain the factors affecting dose calculation.

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

- a) Write a detail note on idiosyncratic drug reactions.
- b) Write patient counseling note for diabetes.
- c) Explain the role of pharmacists in vaccination.
- d) Give patient counseling for OTC products.
- e) What would be the dose of child of 3 and 12 years; if the adult dose is 200 mg.
- f) Write a note on rational drug use.
- g) Explain the role of pharmacists in family planning.

**Q6)** Answer any two.

**[10]**

- a) Explain role of pharmacists in community healthcare and education of HIV/AIDS.
- b) Explain the steps in patient counseling and write a note on patient counseling for prescription drugs.
- c) Write in detail note on self medication.
- d) Discuss with examples; chemical incompatibility in prescription drugs.



Total No. of Questions : 6]

SEAT No. :

**P1610**

[Total No. of Pages : 3

**[5345]-103**

**First Year B. Pharmacy**

**(1.1.3T) 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? Explain in detail methods to remove Temporary and Permanent hardness of water.
- b) Explain following limit tests in detail.
  - i) Limit test of Arsenic
  - ii) Limit test for lead

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

- a) Write brief history of Indian Pharmacopoeia.
- b) Discuss the role of Sodium, Potassium and chloride ions in our body.
- c) Write a note on saline cathartics.
- d) Define Monograph. Write in brief storage conditions as per I.P.
- e) Explain bismuth compounds as GIT protective adsorbents.
- f) Give principle involved in the limit test for Iron.
- g) Give composition and role of ORS.

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

**Q3)** Solve any TWO of the following : **[10]**

- a) Write a note on electrolytes used in Acid Base Therapy.
- b) Discuss official control test of water.
- c) Write a note on sources of impurities in pharmaceuticals.
- d) What are antacids? Discuss combination of antacid preparations.

### **SECTION - II**

**Q4)** Attempt any ONE of the following : **[10]**

- a) Give the biological role of Iron and Copper. Give preparation, properties, uses and storage of –
  - i) Ferrous sulphate
  - ii) Ferric ammonium citrate
  - iii) Zinc sulphate
- b) What are topical agents? Explain mechanism of action of Antimicrobial agents. Discuss Preparation, Properties, assay and uses of Hydrogen Peroxide.

**Q5)** Solve any FIVE of the following : **[15]**

- a) Write storage and labeling conditions for Nitrogen, Nitrous oxide and Oxygen as inorganic gases.
- b) What are dentifrices? Discuss any one example in detail.
- c) Give the mechanism of action of sodium nitrite and sodium thiosulphate in cyanide poisoning.
- d) Give the biological role of zinc element in our body.
- e) Write platinum compounds as cytotoxic agents.



- f) Define along with examples
  - i) Expectorants
  - ii) Astringents
  - iii) Antidotes
- g) Give the biological role of Oxygen and Carbon dioxide.

**Q6)** Solve any TWO of the following : **[10]**

- a) Write a note on fluorides as anticaries agents.
- b) Explain topical protective and adsorbents with suitable examples.
- c) Give the physiological role of iodine and discuss iodine and its preparations.
- d) Explain Barium Sulphate as Radio opaque Contrast Media.



Total No. of Questions : 6]

SEAT No. :

P1611

[Total No. of Pages : 4

[5345]-104

F.Y. B. Pharmacy

PHARMACEUTICAL ORGANIC CHEMISTRY - 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 sheet.
- 3) Neat diagrams must be drawn in separate answer sheet.
- 4) Figures to the right indicate full marks.

**SECTION - I**

**Q1)** Define and Classify Hybridization? Explain the formation of Methane on the basis of hybridization. H-C-H bond angle in Methane is  $109^{\circ} 28'$  with tetrahedral geometry Justify. [10]

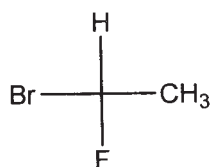
OR

What is aromatic electrophilic substitution reaction? Write down the mechanism of Halogenation and nitration of benzene. What is the importance of concentrated sulphuric acid in nitration?

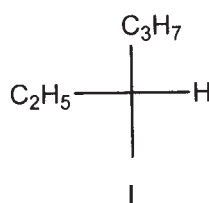
**Q2)** Answer the following (Any Five) : [15]

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

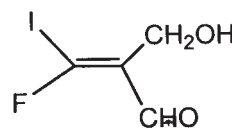
(i)



(ii)

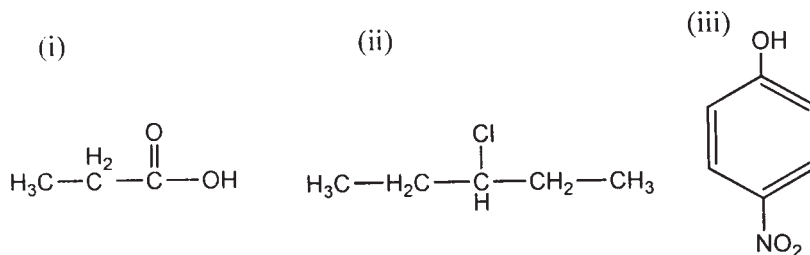


(iii)



P.T.O.

b) Write IUPAC names for following structures



c) Write any three methods of preparation of alkanes.

d) Define following terms with suitable examples.

i) Free radicals

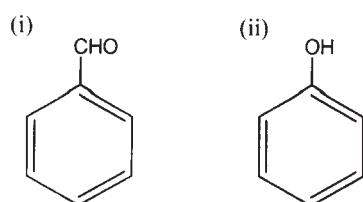
ii) Carbocation

iii) Nucleophile

e) Discuss Anti-Markovnikoff rule with example.

f) Halogens being electronegative are o,p directors in aromatic electrophilic substitutions why?

g) Draw resonating structures of following.



**Q3)** Answer the following (Any Two)

**[10]**

a) Define isomerism. Classify geometrical isomerism with examples.

b) Classify organic compounds on the basis of elemental composition (at least five classes with suitable examples).

c) Explain the addition-elimination and elimination-addition mechanisms of nucleophilic aromatic substitution.

d) Explain Tautomerism and hyper conjugation with example.

## SECTION - II

**Q4)** a) What are alkenes and alkynes? Explain any two addition reactions of alkenes. **[10]**

b) Classify chemical reactions. Explain any one type with suitable examples.

OR

Explain the directing effects of following functional groups towards electrophilic substitutions on benzene :

a)  $-\text{NH}_2$

b)  $-\text{CH}_3$

c)  $-\text{CHO}$

d)  $-\text{NO}_2$

**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) Write a note on ozonolysis.

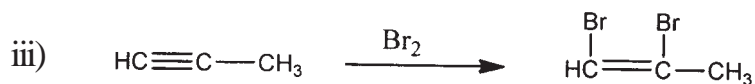
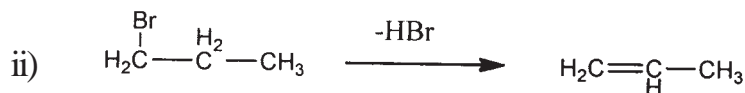
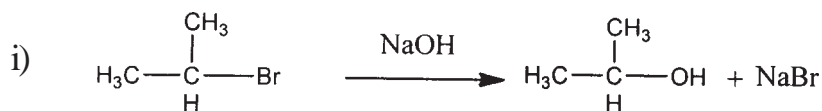
d) Draw structures from IUPAC names of following :

i) Propanamine

ii) Ethyl butanoate

iii) 3,3 dichloropentane

e) Identify the type of chemical reaction (Addition, Substitution etc) in following :



f) Explain mesomeric effect and electromeric effect with example.

g) Explain the effects of H-bonding on Melting point, solubility, and acidity with suitable examples.

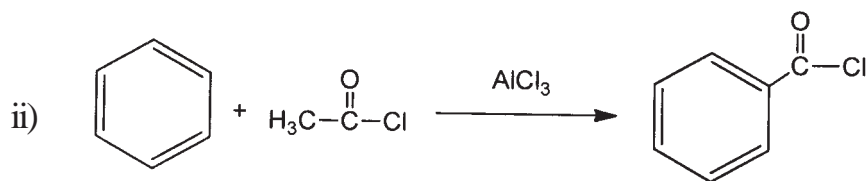
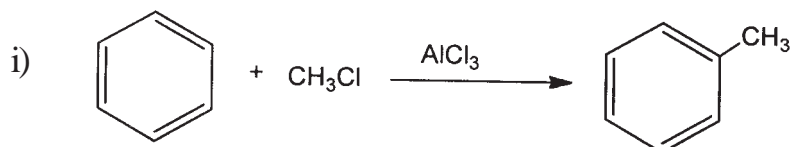
**Q6)** Answer the following (Any Two) : :

**[10]**

a) Explain Inter and Intra molecular forces of attraction.

b) What are conjugated dienes? Write their any two addition reactions.

c) Write down the stepwise mechanism for following reactions



d) Explain formation of Ammonia and its geometry on the basis of hybridization.



Total No. of Questions : 6]

SEAT No. :

**P1612**

[Total No. of Pages : 2

**[5345]-105**

**First Year B. Pharmacy**

**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) *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 the composition and functions of blood. Explain in detail mechanism of blood clotting. **[10]**

OR

Enlist the basic types of tissues. Write characteristics of each type. Describe epithelial tissues in detail.

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

- a) Explain the structure and functions of mitochondria.
- b) Describe the structure and functions of RBCs.
- c) Draw neat labeled diagram of cell.
- d) Explain the muscle tone in detail.
- e) Describe Hemolytic Disease of Newborns.
- f) Enlist various systems of human body with their components and functions.
- g) Explain the positive feedback loop with example.

**P.T.O.**

- Q3)** Write short note on (Any 2) : **[10]**
- a) WBCs.
  - b) Plasma membrane.
  - c) Connective tissues.
  - d) Cell division.

**SECTION - II**

- Q4)** With neat labeled diagram explain conduction system of heart. Add note on phases of action potential in cardiac muscles. **[10]**

OR

Enlist the organs of digestive system. Explain in detail location, anatomy, histology and functions of liver.

- Q5)** Answer the following (Any 5) : **[15]**
- a) Write a note on heart valves.
  - b) Discuss the neural regulation of blood pressure.
  - c) Explain the composition, formation and circulation of lymph.
  - d) Explain structure of lymph node.
  - e) Describe the structure of heart wall.
  - f) Define the terms: Angina, Peptic ulcers & Splenomegaly.
  - g) Explain the structure and functions of Stomach.

- Q6)** Write short note on (Any 2) : **[10]**
- a) Small intestine: Anatomy, Histology and functions.
  - b) Structure of Blood vessels.
  - c) Electro-cardiogram (ECG).
  - d) Spleen.



Total No. of Questions : 6]

SEAT No. :

**P1613**

[Total No. of Pages : 2

**[5345]-106**

**F.Y. B. Pharmacy (Semester - I)**

**COMMUNICATION AND SOFT SKILL DEVELOPMENT  
(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.*
- 3) *Neat labeled diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Write meaning and importance of communication. Explain objectives of Communication. Describe the different modes of overcoming barriers of communication. **[10]**

OR

Explain various parts of business letters. Explain the purpose and qualities of business correspondence.

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

- a) Difference between technical and general writing communication.
- b) State the principles of thinking about purpose.
- c) Language as a tool of communication.
- d) Explain about abstract.
- e) Explain need of Non verbal communication.
- f) Write the salient features of electronic communication.
- g) Explain importance of case writing.

**P.T.O.**



- Q3)** Write short note on (Any 2) : **[10]**
- a) Body Language.
  - b) Graphic Language.
  - c) Knowing the audience.
  - d) Formal report.

**SECTION - II**

- Q4)** Describe the applications of modern technology in communication. **[10]**

OR

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

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

- a) Write the importance of preparing rough data
- b) Format of Enquiry letter.
- c) Importance of written business correspondence.
- d) Describe Intonation and rhythms.
- e) Explain importance of tele communication.
- f) Write the different conventional media.
- g) Write email etiquettes.

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

- a) Notice and circular
- b) Phonetic symbols
- c) Resume
- d) Empathy



Total No. of Questions : 6]

SEAT No. :

P1614

[Total No. of Pages : 3

[5345]-107

First Year B. Pharmacy

COMPUTER APPLICATIONS AND BIostatISTICS

(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

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

**SECTION - I**

- Q1)** a) Define different types of errors in hypothesis testing with example. [5]
- b) Find Mean & Mode of the following data. [5]  
12, 7, 15, 17, 20, 15, 30, 26, 10, 9.

OR

- a) Find Median for the following data and also calculate Mean deviation about Median & its coefficient. [5]

|              |      |       |       |       |       |
|--------------|------|-------|-------|-------|-------|
| Class-limits | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
| Frequency    | 8    | 15    | 22    | 15    | 8     |

- b) Find range and its coefficient from the following data. [5]

|                |     |     |     |     |     |     |     |     |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Hour           | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   |
| Blood pressure | 120 | 130 | 140 | 100 | 110 | 120 | 120 | 130 |

- Q2)** a) Explain principle and steps involved in experimental design. Give advantages and disadvantages of experimental design. [5]
- b) Four coins are tossed simultaneously. What is the probability of getting at least two heads. [5]
- c) Write note on parallel designs. [5]

**P.T.O.**

**Q3)** a) Psychological tests of intelligence and arithemetical ability were applied to 10 candidates. Results are given below.

|                        |    |    |     |    |    |     |    |    |    |    |
|------------------------|----|----|-----|----|----|-----|----|----|----|----|
| Intelligence ratio (X) | 90 | 95 | 115 | 96 | 85 | 110 | 89 | 98 | 97 | 93 |
|------------------------|----|----|-----|----|----|-----|----|----|----|----|

|                      |    |    |     |     |    |     |    |     |     |    |
|----------------------|----|----|-----|-----|----|-----|----|-----|-----|----|
| Arithmetic ratio (Y) | 95 | 90 | 110 | 100 | 85 | 105 | 94 | 106 | 111 | 93 |
|----------------------|----|----|-----|-----|----|-----|----|-----|-----|----|

Compute Spearman's rank correlation coefficient between X and Y. [5]

b) From the data given below, calculate equation of two lines of regression.

|   | Mean | S.D |
|---|------|-----|
| X | 36   | 11  |
| Y | 85   | 8   |

Coefficient of correlation is 0.8. Also estimate value of X when Y = 75. [5]

c) Define the terms : [5]

- i) Hypothesis.
- ii) Null hypothesis.
- iii) Alternate hypothesis.
- iv) Level of significance.
- v) Statistics

### **SECTION - II**

**Q4)** a) Draw a block diagram of computer, label all components. [5]

b) Explain different forms of representing data. [5]

c) Explain various storage units of Memory. [5]

- Q5)** a) Explain Generation of computers. [10]  
b) Explain different types of softwares. [5]

OR

- b) Explain any two GUI components with a labelled diagram. [5]
- Q6)** a) Explain any two features of Word Processor. [5]  
b) State and explain any two functions used in spreadsheet. [5]

OR

- b) Explain use of presentation software in Business and Education. [5]



Total No. of Questions : 6]

SEAT No. :

**P1615**

[Total No. of Pages : 2

**[5345]-201**

**F.Y. B. Pharmacy**

**121: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)** Describe construction and working of rotary drum filter with its neat well labeled diagram. Give industrial application of rotary drum filter. **[10]**

OR

Give pharmaceutical significance of size reduction. Add a note on fluid energy mill.

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

- a) Write a note on evaluation of plastic as a packaging material?
- b) Describe strip packing as unit dose packing material.
- c) Write the factors affecting rate of filtration.
- d) What is filter aid and what are its ideal characteristics?
- e) Draw neat and well labeled diagram of Multi mill.
- f) What are various mechanisms of size reduction?
- g) Give powder gradation as per Indian Pharmacopoeia.

**P.T.O.**

- Q3)** Write short note on (Any 2) : **[10]**
- a) Filter leaf.
  - b) Blister packing.
  - c) Liquid filling technology.
  - d) Types of glass.

**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 sigma blender.
  - b) Write on planetary mixer.
  - c) How can aeration and foaming be prevented?
  - d) What is the meaning and significance of bioavailability?
  - e) Write on any two mechanisms of drug absorption.
  - f) What is first pass effect?
  - g) Define and explain the term 'minimum effective concentration'.

- Q6)** Write short note on (Any 2) : **[10]**
- a) Excretion.
  - b) Good Manufacturing Practices.
  - c) Bioequivalence.
  - d) Metabolism.



Total No. of Questions : 6]

SEAT No. :

**P1616**

[Total No. of Pages : 2

**[5345]-202**

**F.Y. B. Pharmacy (Semester - II)**

**DOSAGE FORM DESIGN**

**(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.*
- 3) *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

Define and explain different types of emulsions and discuss instabilities in emulsion.

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

- a) Compare dry gum and wet gum method.
- b) Explain novel drug delivery system.
- c) Add a note on wetting agents.
- d) Add a note on microemulsion.
- e) Formulation aspects of talcum powder.
- f) Write a note on precipitate forming liquid suspension.
- g) Clasify suspensions along with examples.

**P.T.O.**

- Q3)** Write short note on (Any 2) : **[10]**
- a) Explain different methods of granulation.
  - b) Suspending Agents.
  - c) Evaluation tests for suspension.
  - d) Define dosage forms and classify different types of dosage forms.

**SECTION - II**

- Q4)** Explain Radiopharmaceuticals and write a note therapeutic and diagnostic application of Radiopharmaceuticals. **[10]**

OR

Explain different factors affecting rate of solubility and dissolution of drugs.

- Q5)** Answer the following (Any 5) : **[15]**
- a) Formulation aspects of Creams.
  - b) Define and classify different semisolid preparations.
  - c) Explain wet granulation process.
  - d) Add a note on displacement value.
  - e) Suppository bases.
  - f) Importance of coca butter.
  - g) Explain gelling agents.

- Q6)** Write short note on (Any 2) : **[10]**
- a) Explain Noye's Whitney equation.
  - b) Factors affecting stability of suspension.
  - c) Quality control of gels.
  - d) Manufacturing of radiopharmaceutical dosage forms.





Total No. of Questions : 6]

SEAT No. :

P1617

[Total No. of Pages : 3

[5345]-203

First Year B. Pharmacy

1.2.3 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)** Aldehydes and Ketones are susceptible for nucleophilic addition reactions explain. Write any two methods of preparation of aldehydes and write a note on Cannizaro reactions. [10]

OR

Give Reaction, Mechanism and Applications of Perkin Reaction and Mannich Reaction.

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

- a) Draw structures from IUPAC names of following :
  - i) 2-methoxy butane
  - ii) 2,4,6-trinitro phenol
  - iii) 2-pentanone
- b) Discuss any two reactions of alcohols
- c) Explain Hinsberg test.
- d) Explain Kolbe - Schmidt reaction of phenols

**P.T.O.**

- e) Discuss any two methods of preparation of sulphonic acids.
- f) Comment on Williamson's ether synthesis.
- g) Explain acidity of Phenol.

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

- a) Write a note on Aldol Condensation.
- b) Tests to distinguish between primary, secondary and tertiary alcohols.
- c) Explain Haloform reaction.
- d) Explain Diazo coupling reaction

### **SECTION - II**

**Q4)** Discuss reaction mechanism and factors affecting  $SN^1$  and  $SN^2$  reactions. **[10]**

OR

Write any three methods of preparation and three reactions of carboxylic acids. Classify functional derivatives of carboxylic acids with examples.

**Q5)** Solve the following (ANY 5) : **[15]**

- a) Write any two reactions of esters.
- b) Distinguish between cyanides and isocyanides.
- c) Classify alkyl halides with suitable examples.
- d) Explain Dieckmann reaction.
- e) Write any two methods of preparation of amides.
- f) Write any two reactions of acid chlorides.
- g) Draw structures for following IUPAC names:
  - i) Propanoic anhydride
  - ii) 2-Bromo-3-hydroxy pentanoic acid
  - iii) Pentanoyl chloride

**Q6)** Write short notes on (Any 2) :

**[10]**

- a) Substitution nucleophilic internal reaction.
- b) Preparation and reactions of Nitriles.
- c) Claisen's reaction.
- d) Preparation and reaction of anhydrides.



Total No. of Questions : 6]

SEAT No. :

**P1618**

[Total No. of Pages : 2

**[5345]-204**

**F.Y. B. Pharmacy**

**124 : HUMAN ANATOMY AND 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) *Neat labeled diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Draw neat labeled diagram of internal ear. Add note on labyrinth. Explain physiology hearing. **[10]**

OR

Draw a neat labeled diagram of cross section of Spinal Cord. Explain in detail anatomy of spinal cord.

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

- a) Explain functions of hypothalamus.
- b) Write a note on extrapyramidal system.
- c) Draw a neat labeled diagram of respiratory system.
- d) Discuss about different respiratory volumes with their clinical significance.
- e) Describe the structure of trachea.
- f) Explain the epidermis of skin.
- g) Write an account on taste buds.

**P.T.O.**

- Q3)** Write short note on (Any 2) : **[10]**
- a) Cerebrum.
  - b) Lungs.
  - c) Physiology of respiration.
  - d) Sympathetic & Parasympathetic nervous system.

**SECTION - II**

- Q4)** Draw a neat labeled diagram of internal structure of kidney and explain physiology of urine Formation. **[10]**

OR

Explain in detail various phases of Menstrual Cycle and hormones involved in it.

- Q5)** Answer the following (Any 5) : **[15]**
- a) Write a note on the juxtaglomerular apparatus (JGA).
  - b) Describe the structure of sperm.
  - c) Write a note on Anti-Diuretic Hormone.
  - d) With a neat labeled diagram Explain the structure of nephron.
  - e) Draw a neat labeled diagram of male reproductive system.
  - f) Write a note on Hypothalamic hormones.
  - g) Explain the anatomy & histology urinary bladder.

- Q6)** Write short note on (Any 2) : **[10]**
- a) Pituitary gland.
  - b) Renin angiotensin aldosterone system.
  - c) Physiology of micturition.
  - d) Spermatogenesis.



Total No. of Questions : 6]

SEAT No. :

**P1619**

[Total No. of Pages : 3

**[5345]-205**

**F.Y. B.Pharmacy**  
**PHARMACOGNOSY**  
**(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) Attempt any one :**

- a) Elaborate a detail account of important branches of biology along with its relevance of biology to pharmaceutical sciences. **[10]**

OR

- b) Elaborate a detail account of Plant cell division.

**Q2) Attempt any Five :**

**[15]**

- a) Provide a classification of seeds.
- b) Enlist various classes of applied biology.
- c) Enlist various steps involved in RNA Translation.
- d) Provide Reserve materials of plant origin.
- e) Provide in brief classification of Trichomes.
- f) Provide morphological details of back.
- g) Differentiate between meristematic tissue and permanent tissue.

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

**Q3)** Write short note on any Two of following : **[10]**

- a) Molecular basis of hereditary.
- b) Structure and functions of proteins.
- c) Phytohormones.
- d) Primary and Secondary growth.

**SECTION - II**

**Q4)** Attempt any one :

Explain in detail Definition. History Development status of pharmacognosy. **[10]**

OR

Explain need of classification in plant taxonomy along with importance of artificial and natural methods of classification.

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

- a) Differentiate between Autotropic and Heterotropic.
- b) Provide significance of Chemosynthesis.
- c) Provide historical account of contribution to botanical system of classification.
- d) Explain in brief ecological succession.
- e) Differentiate Speciation and Extinction.
- f) Describe in brief Mutation.
- g) Define crude drug and enlist its various classes.

**Q6)** Write short note on any two of following :

**[10]**

- a) Conservation strategies.
- b) Factors responsible for Rapid degradation of habitats of western ghats.
- c) Scope & significance of pharmacognosy.
- d) Hybridization.





Total No. of Questions : 6]

SEAT No. :

P1620

[Total No. of Pages : 2

[5345]-206

**F.Y. B.Pharmacy (Semester - II)**  
**PHARMACEUTICAL ANALYSIS - I**  
**(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 books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Explain theoretical considerations, limitations and 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.

**P.T.O.**

**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.

**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 Cerimetry.

**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
- d) Adsorption indicators.



Total No. of Questions : 6]

SEAT No. :

P1621

[Total No. of Pages : 3

[5345]-301

S.Y. B. Pharmacy

231 : PHYSICAL PHARMACEUTICS - 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 diagram must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.

**SECTION - I**

Q1) Attempt any one :

Explain the different terms used in the Gibbs phase rule, explain the phase diagram for one component system with its pharmaceutical significance. [10]

OR

Explain the different methods for liquefaction of gases with their principles.

Q2) Attempt any Five :

[15]

- a) What is Raoult's law? give its significance in pharmacy.
- b) Draw a neat labeled phase diagram for two component system having eutectic point.
- c) Explain the Van der Waal equation for real gases.
- d) Explain the concept of Escaping Tendency of a material.

P.T.O.

- e) The freezing point depression of a solution of 1.000 g of 1,3-dinitrobenzene in 50.0 g of benzene was determined by the equilibrium method and was found to be  $0.6095^{\circ}\text{C}$ . Calculate the molecular weight of 1,3-dinitrobenzene if cryoscopic constant for benzene is 5.12
- f) What are solid dispersions? give its significance in pharmacy.
- g) Why lowering of the Vapour Pressure is a colligative property?

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

- a) Osmotic pressure measurement.
- b) Specific and equivalent conductance.
- c) Ebullioscopic method for determination of boiling point elevation.
- d) Fractional distillation and boiling point diagram.

### **SECTION - II**

**Q4)** Attempt any one :

Derive the equation for solubility of solids in liquids and discuss factors affecting it. **[10]**

OR

Explain effect of molecular affinity and ionic dissociation on Distribution phenomenon.

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

- a) Discuss applications of distribution phenomenon
- b) Define and differentiate between saturation solubility and intrinsic solubility.
- c) Derive Bragg's equation and give its significance.

- d) State the equation for solubility parameter and give its significance.
- e) Discuss significance of polymorphism in Pharmaceuticals.
- f) Define Thermodynamic, Enthalpy and entropy.
- g) Discuss distribution Coefficient Phenomenon and factors affecting it.

**Q6)** Write short notes (Any two) :

**[10]**

- a) Factors affecting solubility.
- b) Solubility of gases in liquids.
- c) Crystal parameters.
- d) Glass transition temperature.



Total No. of Questions : 6]

SEAT No. :

P1622

[Total No. of Pages : 2

[5345]-302

**S.Y. B. Pharmacy (Semester - III)**  
**PHARMACEUTICAL MICROBIOLOGY**  
**Physical Microbiology**  
**(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 books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Define Culture media and write the different techniques used for preservation of bacterial culture. **[10]**

OR

Enlist the different growth requirement of bacteria and explain in detail different methods used for measurement of bacterial growth.

**Q2)** Answer the following (ANY FIVE) : **[5 × 3 = 15]**

- a) Explain the importance of yeast and moulds.
- b) Explain the basis of five Kingdom classification scheme according to Whittaker.
- c) How will you detect presence of Salmonella in pharmaceuticals?
- d) Draw the growth curve of bacteria.
- e) Write contribution of Robert Koch in microbiology.
- f) Draw the structure of penicillium.
- g) Write the general properties of viruses.

**P.T.O.**

**Q3) Write a note on (ANY TWO) :** **[2 × 5 = 10]**

- a) Significance of Prebiotics and Probiotics.
- b) Identification of specific microorganism
- c) Historical development of microbiology.
- d) Multiplication of Human Virus.

**SECTION - II**

**Q4) What are vaccines? Write the general method of preparation and Quality control of vaccines.** **[10]**

OR

What are microbial virulence and Explain in details nonspecific defense mechanism of host.

**Q5) Answer the following (ANY FIVE) :** **[5 × 3 = 15]**

- a) Write advantages and disadvantages of phenol coefficient test.
- b) Differentiate between Exotoxin and Endotoxin.
- c) Write characteristics of antigen-antibody reaction.
- d) Draw the structure of immunoglobulin.
- e) Write note on phagocytosis.
- f) Write note on ‘Filtration sterilization’.
- g) Comment ‘Moist heat sterilization is more superior to dry heat sterilization’.

**Q6) Write a note on (ANY TWO) :** **[2 × 5= 10]**

- a) Dry heat sterilization.
- b) Radio Immunoassay.
- c) Types of Immunity.
- d) HMI and CMI.



Total No. of Questions : 6]

SEAT No. :

P1623

[Total No. of Pages : 2

[5345]-303

**S.Y. B. Pharmacy (Semester - III)**  
**PHARMACEUTICAL BIOCHEMISTRY**  
**(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 books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Give a classification of enzymes with suitable examples. Explain Non Competitive enzyme inhibition in detail. **[10]**

OR

Give a brief summary of glucose homeostasis. Explain Glycolysis in detail giving its energetics.

**Q2)** Write short note on **any five** of the following : **[15]**

- a) Isoenzymes.
- b) Mutarotation.
- c) Lipoproteins.
- d) Genetic code.
- e) Cholesterol.
- f) Tertiary Structure of Proteins.
- g) Haemoglobin.

**P.T.O.**



- Q3)** Explain **any two** of the following : **[10]**
- a) Transcription.
  - b) Significance of PUFAs.
  - c) Sanger's Method.

**SECTION - II**

- Q4)** Give an overview of Protein Metabolism. Explain the process of Transamination and its significance. **[10]**

OR

Explain the structure and significance of Glycogen. Give a detailed account of its metabolism.

- Q5)** Attempt short notes on **any five** of the following : **[15]**
- a) Transamination.
  - b) Gluconeogenesis.
  - c) Utilization of Cholesterol.
  - d) Synthesis of ATP.
  - e) Ketone bodies.
  - f) Galactose metabolism.
  - g) Purine synthesis.

- Q6)** Write notes on **any two** of the following : **[10]**
- a) Urea Cycle.
  - b) Glycogen metabolism.
  - c) TCA cycle and energetics.



Total No. of Questions : 6]

SEAT No. :

P1624

[Total No. of Pages : 2

[5345]-304

S.Y.B Pharmacy (Semester - III)

PHARMACEUTICAL ORGANIC CHEMISTRY - III

(2013 Pattern) (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.
- 4) Neat diagrams must be drawn wherever necessary.

**SECTION - I**

**Q1)** Explain what is stereo isomerism? Enumerate differences between conformational & configurational stereoisomers . **[10]**

OR

Draw newman projections for all the conformations of 1, 2 – dimethyl cyclohexane and 1,4-dimethyl cyclohexane and comment on their stability.

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

- a) Give significance of stereo chemistry in biological activity of compounds.
- b) What are amino acids, classify them and give any one method of their synthesis
- c) What is meant by flagpole interactions in cyclohexane? Discuss with suitable example.
- d) Comment with suitable example on 1, 3-diaxial interactions.
- e) Discuss in brief the elements of symmetry of a molecule.
- f) Explain the most stable conformation of cyclohexane with reasons
- g) Explain what is torsional strain?

**P.T.O.**

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

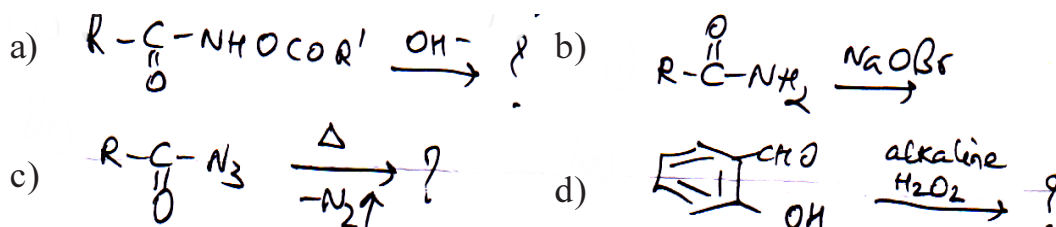
- a) Reg flipping with suitable examples
- b) 1, 3-diaxial interactions
- c) Stereochemistry involved in catalytic hydrogenation
- d) Steric strain with suitable examples.

### SECTION - II

**Q4)** Define molecular rearrangement reactions and classify them. Explain in brief any 2 reactions with mechanisms involving Electron deficient Nitrogen. [10]

OR

Predict the Product/s.



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

- a) Explain the Haworth synthesis of anthracene.
- b) To which of the  $\alpha$ - or  $\beta$ - positions electrophilic substitution preferred in naphthalene? Explain.
- c) Discuss any 2 methods of synthesis of naphthalene
- d) How shall you prepare 2- and 3- phenanthrene sulfuric acids?
- e) Write a short note on cope rearrangement.
- f) Discuss the Bayer – villiger Oxidation.
- g) What is meant by sigmatropic rearrangements? Explain.

**Q6)** Short notes (Any Two) [10]

- a) Favorskii rearrangement
- b) Neber rearrangement
- c) Stevens rearrangement
- d) Lossen rearrangement

▽▽▽▽

Total No. of Questions : 6]

SEAT No. :

**P1625**

[Total No. of Pages : 2

**[5345]-305**

**S.Y. B. Pharm. (Semester - III)**

**PHARMACOLOGY - I**

**(2013 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

- 1) All questions are compulsory.*
- 2) Figures to the right indicate full marks.*
- 3) Write answers for section I and section II in separate answer sheets.*

**SECTION - I**

**Q1)** What are different routes of drug administration? Write merits and demerits of parenteral route of drug administration. **[10]**

OR

Define drug bioavailability. Discuss factors affecting drug bioavailability.

**Q2)** Solve any five

- a) Define pharmacokinetics and pharmacodynamics. **[3]**
- b) Enlist factors affecting drug distribution. **[3]**
- c) Define volume of distribution? What is its importance? **[3]**
- d) Define first pass metabolism of drug? **[3]**
- e) What are essential medicines? **[3]**
- f) What are different types of drug nomenclature? Explain with examples. **[3]**
- g) Enlist new approaches in new drug discovery process. **[3]**

**Q3)** Solve any two

- a) Write a brief note on sublingual route of drug administration. **[5]**
- b) Explain various phases of drug metabolism. **[5]**
- c) Write a short note on clinical trials. **[5]**
- d) Enlist and explain transport process of drugs across plasma membrane. **[5]**

*P.T.O.*

## SECTION - II

**Q4)** Classify receptor and explain in details with example structure and function of ion channel receptor. **[10]**

OR

Write in details pathophysiological role of histamine, classify antihistaminics and write about antihistaminics drugs.

**Q5)** Answer the following (Any five)

- a) What is drug toxicity and Write in detail types of drug toxicity. **[3]**
- b) Explain in detail dose response curve. **[3]**
- c) Define pharmacodynamics and add a note on therapeutic Index. **[3]**
- d) Define drug interaction and classify them with example. **[3]**
- e) Explain in detail drug synergism and drug antagonism phenomenon. **[3]**
- f) Write in details different types and pathophysiological role of prostaglandins. **[3]**
- g) Explain in detail structure activity relationship and its effect on drug action. **[3]**

**Q6)** Solve any two

- a) Explain in details with example structure and function of G protein coupled receptor. **[5]**
- b) Discuss in detail drug treatment in pediatric patients. **[5]**
- c) Define adverse drug reactions with their type. **[5]**
- d) Explain in detail principles of drug action and write in detail factors modifying drug action. **[5]**

▽▽▽▽

Total No. of Questions : 06]

SEAT No. :

P1626

[Total No. of Pages : 2

[5345]-306

S.Y.B. (Pharmacy) (Semester - III)

PHARMACOGNOSY & PHYTOCHEMISTRY - I

(2013 Pattern)

*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 books.*
- 4) *Draw neat and labelled diagram wherever necessary.*

**SECTION - I**

**Q1)** Define Pharmacognosy. Explain in detail the Pharmacognostic scheme of crude drugs. Give the Pharmacognostic scheme of Senna. **[10]**

OR

What are cardiac glycosides? Give the tests for cardiac glycosides. Differentiate between Cardenolides and Bufadienolides.

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

- a) Explain the general extraction of tannins.
- b) Explain the method of preparation of natural fibres.
- c) Give the applications of Agar & Guar gum.
- d) Give the chemical constituents of Digitalis and Citrus peel.
- e) Give the properties of natural fibres.
- f) Give the source and uses of Gelatin.
- g) Give the uses of Artemisia & Strophanthus.

**P.T.O.**

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

- a) Extraction of Pectin.
- b) Gums and mucilage with examples.
- c) Tannins.
- d) Industrial applications of lipids & proteins.

### **SECTION - II**

**Q4)** Write a detailed note on the Enzymes and their significance. Add a note on Papain and Streptokinase. **[10]**

OR

What are plant metabolites? Distinguish between primary & secondary metabolites. Explain the significance of secondary metabolites with examples.

**Q5)** Answer any four questions : **[15]**

- a) Give the uses of Senna, squill and Rhubarb.
- b) How do you evaluate fats and oils?
- c) What are natural fibres?
- d) What are O-glycosides and C-glycosides? Give examples.
- e) What is Gambier? Give its pharmaceutical importance.
- f) What is Myrobalan? Give its pharmaceutical importance.
- g) What is the basic classification of crude drugs?

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

- a) Saponins.
- b) Anthraquinones.
- c) Kalmegh.
- d) Natural fibres.

▽▽▽▽

Total No. of Questions : 6]

SEAT No. :

P 1627

[Total No. of Pages : 2

[5345] - 401

**S.Y. B. Pharmacy (Semester - IV)**  
**PHYSICAL PHARMACEUTICS - II**  
**(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 books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Elaborate significance of thixotropy and give methods of its measurement.  
Write in detail about viscoelasticity. **[10]**

OR

Explain various pathways of decomposition of pharmaceuticals. Add a note on stabilization of pharmaceuticals. **[10]**

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

- i) Define krafft point and cloud point.
- ii) How will you prevent oxidation of a pharmaceutical product?
- iii) Explain chemisorption / chemical adsorption.
- iv) Explain the significance of Arrhenius equation in stability studies.
- v) State the Newtons law of flow and give examples of Newtonian systems.
- vi) Explain principle of capillary rise method for surface tension determination.
- vii) Classify surfactants with examples.

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

- i) Shelf life determination
- ii) Spreading coefficient
- iii) Micellar solubilization
- iv) Cup and bob viscometers

**P.T.O**



## SECTION - II

**Q4)** Define colloids. What are its different types? In a tabular form compare the properties of different types of colloids. **[10]**

OR

Enumerate the various derived properties of powder. How can these be determined?

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

- i) Describe : Brownian motion and Gold number. Give its importance in the field of pharmacy.
- ii) Explain coulter counter method in detail.
- iii) Justify factors affecting flow of powders.
- iv) Define : Angle of repose, Porosity and Granule density.
- v) Explain Hofmeister series.
- vi) What are protective colloids? What are its application in pharmacy?
- vii) Explain the concept of Donnan-membrane equilibrium with its role in pharmacy.

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

- i) Particle size and size distribution.
- ii) Stabilization of colloidal system.
- iii) Method for determining surface area.
- iv) Electrical double layer.



Total No. of Questions : 6]

SEAT No. :

P 1628

[Total No. of Pages : 2

[5345] - 402

**S.Y. B. Pharmacy (Semester - IV)**

**PATHOPHYSIOLOGY AND CLINICAL BIOCHEMISTRY**

**(2013 Pattern)**

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Define & classify heart failure. Explain in detail pathophysiology of heart failure. **[10]**

OR

Discuss in detail pathophysiology of chronic obstructive pulmonary disease.

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

- a) Write the etiology of Ulcer
- b) Define and Enlist the types of heart failure
- c) Define Ulcer and Leukaemia.
- d) Write the complications of arrhythmia
- e) Write pathophysiology of hypertension
- f) Define and enlist the types of Hepatitis
- g) Write the clinical manifestations of alcoholic liver disease.

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

- a) Buerger disease
- b) Inflammation
- c) Pneumonia
- d) Leukaemia

**P.T.O**

**SECTION - II**

**Q4)** Define pain and explain in detail pathophysiology of pain. **[10]**

OR

Define Nephritis and explain in detail pathophysiology of Nephritis.

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

- a) Define and classify Epilepsy
- b) Write etiology of sexually transmitted Diseases
- c) Write epidemiology of Alzheimers disease
- d) Write causative agent of malaria and syphilis
- e) Discuss clinical manifestations of Gout.
- f) Write possible complications of urinary calculi
- g) Define :
  - i) Epidemiology
  - ii) Dysmenorrhea
  - iii) Malignancy

**Q6)** Write note on following (Any two) : **[10]**

- a) Sleep disorders
- b) Diabetes Mellitus
- c) Myasthenia gravis
- d) Osteoarthritis



Total No. of Questions : 6]

SEAT No. :

P 1629

[Total No. of Pages : 2

[5345] - 403

S.Y. B. Pharmacy (Semester - IV)

PHARMACEUTICAL ORGANIC CHEMISTRY - IV

(2013 Pattern)

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 and rules in retrosynthesis. **[10]**

OR

Give methods of synthesis and reactions of pyrrole.

**Q2)** Answer in short (any five) **[15]**

- a) Give reason : Indole like pyrrole is non basic in nature
- b) Give following reactions of quinoline
  - i) Chichibabin Reaction
  - ii) Reduction
- c) Give reason : Furan shows electrophilic substitution at 2 or 5 position
- d) Give any three methods of preparation of imidazole
- e) Give following reactions of pyridine :
  - i) Nitration
  - ii) Metallation
- f) Give any three reactions of furan
- g) Draw the following heterocycles with numbering and example of one drug each :
  - i) Pyrimidine
  - ii) Quinazoline
  - iii) Isoquinoline

**P.T.O**

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

- a) Electrophilic substitution reactions of quinoline
- b) Methods of synthesis of indole
- c) Electrophilic substitution reactions of imidazole
- d) Retrosynthetic route of sulfamethoxazole

**SECTION - II**

**Q4)** What is combinatorial synthesis? Comment on Mix and split synthesis in combinatorial chemistry. Give applications of combinatorial chemistry. **[10]**

OR

Establish general and cyclic structures of Fructose.

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

- a) What is the reaction of glucose with
  - i) Nitric acid?
  - ii) Bromine water?
  - iii) Sodium borohydrate?
- b) Explain lengthening and shortening the chain of aldoses with respective examples.
- c) How will you distinguish between glucose and fructose?
- d) Give detailed account of muta-rotations of (+) Glucose.
- e) Explain use of Nanochemistry in pharmaceutical organic chemistry.
- f) Explain any two reactions of Arabinoses.
- g) Explain reducing sugars with examples.

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

- a) Microwave assisted synthesis.
- b) Killiani Fischer synthesis
- c) Mary field peptide synthesis.
- d) Establishment of structures of Fructose.



Total No. of Questions : 6]

SEAT No. :

**P1630**

[Total No. of Pages : 2

**[5345] - 404**

**S.Y. B.Pharmacy (Semester - IV)  
PHARMACEUTICAL ANALYSIS - II  
(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.*
- 3) Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Write principle of polarography. Discuss in detail dropping mercury electrode. Write in brief about ilkovic equation. **[10]**

OR

Explain in detail different types of conductometric titration curves. Comment on calibration of conductometer. **[10]**

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

- a) Classify different electrodes used in potentiometry.
- b) Explain mechanisms of mass transfer in electroanalytical techniques.
- c) Define and give formula for specific and equivalent conductance.
- d) What is cell constant? Write its importance.
- e) Write in brief about end point detection in potentiometry.
- f) Explain need of hydration of glass electrode.
- g) Write role of supporting electrolyte and maxima suppressors in polarography.

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

- a) Pulse polarography.
- b) High frequency titrations.
- c) Ion selective electrodes.
- d) Applications of conductometry

## SECTION - II

**Q4)** Write principle of coulometric analysis. Discuss in detail about Instrumentation of constant Current Coulometric analysis. **[10]**

OR

Discuss about principle, instrumentation and applications of Amperometric titrations. **[10]**

**Q5)** Attempt any five of the following. **[5 × 3 = 15]**

- a) Write a note on CD and ORD spectra.
- b) Explain specific and molar refraction.
- c) Give an account on general characteristic of coulometric technique.
- d) Effect of temperature and solvent on optical activity.
- e) Explain cotton effect.
- f) Discuss about Karl fisher reagent.
- g) Write function of Czerny Turner mount. In which instrument it is used.

**Q6)** Write a note on (any two) **[2 × 5 = 10]**

- a) Spectropolarimeter.
- b) Oxygen combustion flask techniques.
- c) Applications of polarimetry.
- d) Abbe's Refractometer.



Total No. of Questions : 6]

SEAT No. :

**P3994**

[Total No. of Pages : 2

**[5345]-405**

**S.Y. B.Pharm. (Semester - IV)**

**PHARMACOGNOSY AND PHYTOCHEMISTRY - II**

**(2013 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answers 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 Ipecac** **[10]**

OR

Give pharmacognostical account of Rauwolfia **[10]**

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

- a) Draw transverse section of Ephedra bark
- b) Write Murexide test and give its significance.
- c) Differentiate between True alkaloids and Amino alkaloids
- d) Differentiate between Bolivian coca and Peruvian coca
- e) Write biological source, chemical constituents and .uses of drug of Glycoalkaloid class
- f) Explain life cycle of Ergot
- g) State the microscopical difference between the Cinchona bark and Kurchi bark

**P.T.O**



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

- a) Pilocarpus
- b) Extraction of alkaloids
- c) Tobacco
- d) Adulterants and substitutes of Nuxvomica

**SECTION - II**

**Q4) What are volatile oils? Explain general methods of extraction of volatile oils. [10]**

OR

What are terpenoids? Give the pharmacognostic account on "Cinnamon". [10]

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

- a) Give the biological source, chemical constituents and uses of Taxus.
- b) Explain the histological characteristics of Clove.
- c) Explain adulterants of Saffron.
- d) Classify Resins with examples.
- e) Give structure and uses of Bixin,
- f) Give the biological source, chemical constituents and uses of Cannabis.
- g) Give the chemical constituents, chemical test and uses of Santonica.

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

- a) Give the Pharmacognostic account on "Guggul".
- b) Explain general biogenesis of terpenoids.
- c) Write a note on Podophyllum.
- d) Explain in brief pharmacognostic study of Boswellia and Lavender.



Total No. of Questions : 6]

SEAT No. :

**P1631**

[Total No. of Pages : 2

**[5345] - 406**  
**S.Y. B. (Pharmacy) (Semester - IV)**  
**PHARMACEUTICAL ENGINEERING**  
**(2013 Pattern)**

*Time :3 hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

- 1) Answer to the two sections should be written in separate answer 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 Heat transfer. Which are the different mechanisms of heat transfer and discuss heat transfer by radiation. **[10]**

OR

Define evaporation. Explain multiple effect evaporator in detail. **[10]**

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

- a) Draw a neat labelled diagram of spray dryer.
- b) Explain fourier's law of heat transfer.
- c) Explain wiped film evaporator.
- d) Explain detail classification of heat exchangers.
- e) Explain molecular diffusion in gases.
- f) Give applications of drying.
- g) Explain convective type of heat transfer.

**Q3)** Answer the following (any two) **[10]**

- a) Explain tray drier.
- b) Give surface renewal theory and penetration theory of interphase mass transfer.
- c) Tubular heat exchanger.
- d) Vertical short tube evaporator.

**P.T.O.**

## SECTION - II

**Q4)** Discuss crystallization phenomenon with reference to supersaturation and nucleation. **[10]**

OR

Define and explain rectification and molecular distillation. **[10]**

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

- a) Define corrosion and factors influencing corrosion process.
- b) Explain Reynold's number.
- c) Explain any one differential manometer.
- d) Explain theories of crystal growth.
- e) Explain working of Rotameter.
- f) Explain boiling point diagram.
- g) Explain the concept of HETP.

**Q6)** Answer the following (Any two) **[10]**

- a) Swenson Walker crystallizer.
- b) Azeotropic distillation.
- c) Caking of crystals.
- d) Bernoulli's theorem.



Total No. of Questions : 06]

SEAT No. :

P1632

[Total No. of Pages : 2

[5345]-501

T.Y.B. (Pharmacy) (Semester - V)

INDUSTRIAL PHARMACY - I

(2013 Pattern)

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All the 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)** Discuss biopharmaceutical consideration for dosage form design. **[10]**

OR

Discuss in detail different additives used in tablet formulation.

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

- a) Discuss wet granulation process with example.
- b) Give the importance of dissociation of drug and  $p^H$  at GIT with respect to absorption.
- c) Give detail account on mechanism of granulation.
- d) Discuss friability test as per IP.
- e) Discuss chilsonator roller compaction process.
- f) Give detail account on evaluation of granules.
- g) What is the role of superdisintegrants in Mouth dissolving tablet? Give examples.

**P.T.O.**

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

- a) Discuss defects in tablet. Give its remedies.
- b) Give the importance of multiple layer tablets. Discuss buccal and sublingual tablets.
- c) Discuss force volume relationship in tablet manufacturing.
- d) Discuss Extrusion and Spheronization.

**SECTION - II**

**Q4) Describe in detail steps involved in Sugar coating.** **[10]**

OR

Enlist different types of Tablet coating pans and Discuss in detail any two coating pans.

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

- a) What are different shapes of soft gelatin capsule? Discuss concept of Gel strength.
- b) Enlist various enteric coating materials?
- c) Write about Accela - coata?
- d) What do you mean by Rotofil and Rotosort. Discuss mG2
- e) Explain various material used in Film coating?
- f) Discuss Dria - coater?
- g) Enlist difference between Hard Gelatin Capsule and Soft Gelatin Capsule.

**Q6) Solve any two:** **[10]**

- a) Discuss in details variables involved in sugar coating.
- b) Add note on Fluidized Bed Coater.
- c) Discuss in detail film coating defects and give its remedies.
- d) IPQC test for Capsules as per I.P



Total No. of Questions : 6]

SEAT No. :

P1633

[Total No. of Pages : 2

[5345]-502

T.Y. B.Pharmacy

352 : PHARMACEUTICAL ANALYSIS - III

(Semester - V) (2013 Pattern) (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)** What is EMR. Explain the wave and particle properties of EMR. Classify instrumental methods based on interaction of EMR with Matter. [10]

OR

State Beer-Lambert's law and derive equation for it. Discuss in detail the limitations to Beer's law.

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

- a) Classify instrumental methods of analysis.
- b) Discuss interferences encountered in analysis by flame photometry.
- c) Write a note on Woodward-Fieser rule.
- d) Explain the term chromophore, bathochromic shift and hypsochromic shift.
- e) Write a note on applications of flame photometry.
- f) Discuss different types of electronic transitions involved in UV-Spectroscopy.
- g) Write a note on separating analytes from interferents.

**P.T.O.**

**Q3)** Write a note on Any Two: [10]

- a) Radiation sources used in UV-Vis. Spectrophotometry
- b) Principle & instrumentation of flame photometry
- c) Liquid-liquid extraction
- d) Derivative spectrophotometry

**SECTION - II**

**Q4)** Discuss in detail about principle and theory of fluorimetric analysis [10]

OR

Explain about instrumentation of Atomic Absorption Spectroscopy

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

- a) Excitation and emission spectra
- b) Applications of Atomic emission Spectroscopy
- c) Explain instrument of Phosphorimeter
- d) Factor affecting fluorescence and phosphorescence
- e) Theory of turbidometric analysis
- f) Write applications of phosphorimetry
- g) Discuss source used in Atomic Emission Spectrophotometry

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

- a) Burners used in Atomic Emission Spectroscopy
- b) Theory of Atomic Emission Spectroscopy
- c) Nephelometer
- d) Spectrofluorimeter



Total No. of Questions : 6]

SEAT No. :

P1634

[Total No. of Pages : 2

[5345]-503

Third Year B.Pharmacy (Semester - V)

MEDICINAL CHEMISTRY - I

(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.*
- 3) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** What are major pathways of drug metabolism? Explain phase I reactions. [10]

OR

Classify diuretics with suitable example. Discuss MOA and SAR of each class.

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

- a) Write synthesis of furosemide.
- b) Explain Ing's rule of five.
- c) Classify ganglionic blockers with suitable example.
- d) Write synthesis of prazosin.
- e) Highlight SAR of directly acting sympathomimetics
- f) Give focus on anticoagulants.
- g) What is protein binding? Write its significance.

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

- a) Discuss SAR and MOA of acetylcholine inhibitors.
- b) Comment on blood brain barrier and its effects on drug distribution.
- c) Write synthetic route of guanethidine.
- d) Explain stereochemical factors affecting drug action.

**P.T.O.**



## SECTION - II

**Q4)** Write in detail about anti-arrhythmic agents. **[10]**

OR

Explain in detail about adrenergic receptor antagonists.

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

- a) Explain in detail about cholinergic receptors.
- b) Give an account of forces involved in drug receptor interactions.
- c) Write synthesis of methyldopa.
- d) Comment on cardio tonics.
- e) Write biosynthesis, storage, metabolism and release of catecholamine.
- f) Explain structure and functions of intracellular cyclic nucleotides.
- g) Write biosynthesis, storage, release and metabolism of acetylcholine.

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

- a) Write note on antihyperlipidemics.
- b) Sketch out synthetic pathway of atenolol.
- c) What are the types of receptors? Explain each type in detail.
- d) Classify parasympathomimetics and explain any one class in detail.



Total No. of Questions : 6]

SEAT No. :

P1635

[Total No. of Pages : 2

[5345]-504

T.Y. B.Pharmacy (Semester - V)

3.5.4. :PHARMACOLOGY - II

(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.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Define anticholinesterase agents. Classify anticholinesterase agents with suitable example. Explain the mechanism of action, therapeutic uses and adverse effects of reversible anticholinesterases. **[10]**

OR

Define adrenergic receptor antagonist. Classify beta blockers with suitable example. Explain pharmacological action, adverse effect, drug interaction and therapeutic uses of beta blockers.

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

- a) Define the following terms
  - i) Glaucoma
  - ii) Mydriasis
  - iii) Pheochromocytoma
- b) Enlist the difference between sympathomimetic and parasympathomimetic agents.
- c) Classify anticholinergic drugs with suitable example.
- d) Explain biosynthesis of adrenaline.
- e) Classify skeletal muscle relaxants with suitable example.
- f) Classify cholinergic receptors with their site or location.
- g) Comment on succinyl choline is depolarizing blocker.

**P.T.O.**

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

- a) Neuromuscular blocker
- b) Organophosphorus poisoning and its treatment
- c) Alpha blocker
- d) Pharmacotherapy of glaucoma

**SECTION - II**

**Q4) Describe biosynthesis, pharmacological actions, adverse effect and therapeutic uses of estrogen. [10]**

OR

Describe biosynthesis, storage and release of Insulin. Add a note on Insulin preparations.

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

- a) Mode of action of thyroid hormones
- b) Physiological actions of insulin
- c) Therapeutic uses of anabolic steroids
- d) Physiological actions of growth hormone
- e) Mechanism of action of Acarbose
- f) Mechanism of action of oral contraceptives.
- g) Physiological actions of ADH

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

- a) Hormones of hypothalamus.
- b) Calcitonin
- c) Antithyroid drugs
- d) Antiprogesterone



Total No. of Questions : 6]

SEAT No. :

P1636

[Total No. of Pages : 2

[5345]-505

T.Y. B.Pharmacy

**355 : ANALYTICAL PHARMACOGNOSY AND  
EXTRACTION TECHNOLOGY  
(Semester - V) (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.*
- 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) Explain the principle, instrumentation and applications of Supercritical fluid extraction system.
- b) Explain the Principle and applications of Column chromatography.

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

- a) Give the chemical tests for reserpine and atropine
- b) Explain the isolation procedure of rose oil
- c) Describe significance & application of centrifugation
- d) Explain merits and demerits of counter current extraction.
- e) Explain determination of ash values as per WHO guidelines
- f) Explain types of adulteration with an example
- g) Enlist toxic metals and their maximum acceptable limits ion formulation

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

- a) Explain Source, properties, isolation & tests of Piperine
- b) Explain procedure & significance of determination of bitterness value
- c) Explain Source, properties, isolation & tests of eugenol
- d) Explain requirements for Personnel in pharmaceutical quality control laboratories

**P.T.O.**

## SECTION - II

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

- a) Describe in detail method for determination of Tannin content as per WHO
- b) Comment on proximate phytochemical analysis

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

- a) Give the chemical tests for digoxin and menthol
- b) Explain the isolation procedure of atropine
- c) Enlist different types of adsorbents for TLC
- d) Explain merits and demerits of Sonication
- e) Add a note on ‘foaming index’ as per WHO guidelines
- f) Explain principle of sampling
- g) Explain significance of extractable matters

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

- a) Explain solvent extraction process for sennosoids
- b) Explain chemical derivatization technique
- c) Explain the requirements of Infrastructure as per WHO guidelines for Pharmaceutical Laboratory
- d) Add a note on sampling



Total No. of Questions : 6]

SEAT No. :

P1637

[Total No. of Pages : 2

[5345]-506

T.Y.B.Pharmacy

**PHARMACEUTICAL BUSINESS MANAGEMENT & DI-  
SASTER MANAGEMENT**

**(Semester - V) (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.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks*

**SECTION - I**

**Q1)** Explain in detail concept of material management in pharmaceutical industry. **[10]**

OR

Give in details about Organizational structure.

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

- a) What do you mean by levels of management?
- b) Give classification of material.
- c) Describe steps in rational decision making model.
- d) Give an objectives and principals of purchasing.
- e) Give various factors affecting choice of distribution channels.
- f) Describe various types of budgets.
- g) Describe in brief management information system

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

- a) Give Concepts and purpose of controlling. Describe budgetary control.
- b) Market Research with nature and importance.
- c) Functions & responsibility of manger
- d) Fayol's principles of management

**P.T.O.**

## SECTION - II

**Q4)** Define leadership. Explain the qualities of leader and write about different styles of leadership. **[10]**

OR

What is Marketing research? Explain its purpose and write about steps involve in marketing research

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

- a) Define communication. Explain communication process in detail.
- b) Explain factors affecting determination of price
- c) Write different methods of Advertising
- d) Explain 'Maslow's theory of Motivation
- e) Write the difference between Advertisement and Sales promotion
- f) Explain various types of Disaster
- g) Explain in detail steps involve in launching of new product in market

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

- a) Theory X and Theory Y
- b) Disaster preparedness plan
- c) Medical Representative role & qualities required
- d) Sales promotion



Total No. of Questions : 6]

SEAT No. :

P1638

[Total No. of Pages : 2

**[5345]-507**  
**T.Y.B.Pharmacy**  
**357 : API TECHNOLOGY**  
**(Semester - V) (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.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks*

**SECTION - I**

**Q1)** What is oxidation? Describe oxidizing agents with example. Give details of any one API manufactured by oxidation process. **[10]**

OR

What is esterification? What are different types of esterification? Describe manufacturing process of any one API by esterification process.

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

- a) Enlist and describe types of alkylation and various alkylating agents.
- b) What is D.V.S give its importance.
- c) What is fine chemical, describe with examples
- d) What is Bechamp reduction? Describe in short.
- e) Distinguish between Unit process and Unit operation
- f) What is Batch process? Give its details in short
- g) Outline Asymmetric synthesis of Propranolol

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

- a) Outline the following with reference to the Q7 Guideline of API manufacturing:
  - i) Equipment Maintenance and Cleaning
  - ii) Personnel
- b) Unit process of Hydrolysis
- c) Polymorphism in API
- d) Chirality in API Industry

**P.T.O.**



## SECTION - II

**Q4)** Attempt any one question **[10]**  
Explain in brief the steps involved in optimization of organic reactions and processes.

OR

Discuss the various green chemistry approaches in API manufacturing?

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

- a) What is a MSDS?
- b) Explain industrial manufacturing of Amlodipine with suitable flow charts.
- c) Discuss safety and toxicity considerations for selection of reagents for API preparation.
- d) Discuss classification of solvents in API manufacturing.
- e) What are expedient route of synthesis and enlist its characteristics.
- f) Discuss any two process variables in API manufacturing
- g) Explain selection of appropriate IPC in API manufacturing.

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

- a) Reactors in API manufacturing.
- b) Industrial manufacturing method of Metformin with suitable flow charts
- c) Suitable techniques for API purification and isolation.
- d) Strategies for route selection in API manufacturing.



Total No. of Questions : 6]

SEAT No. :

P1639

[Total No. of Pages : 2

**[5345]-601**  
**T.Y.B.Pharmacy**  
**INDUSTRIAL PHARMACY - II**  
**(Semester - VI) (2013 Pattern)**

*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 diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks*

**SECTION - I**

**Q1)** Explain the formulation aspect of suspension. Give evaluation test parameters for suspensions. **[10]**

OR

What are instabilities of emulsion? Explain in detail reasons and precaution to be taken to avoid instability of emulsion.

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

- a) Give classification of emulsifiers.
- b) Enlist and describe in detail any one method for manufacturing of multiple emulsion
- c) Explain various interparticle forces arise between particles in disperse system.
- d) Write a note on structured vehicle with suitable example.
- e) Explain the theory of emulsification.
- f) What is diffusible and indiffusible suspension? Explain quality control parameters of suspension.
- g) Explain concept of Schulze- Hardy rule in stability of suspension.

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

- a) Identification test for type of Emulsion
- b) Microemulsion
- c) Phase Inversion Temperature
- d) Zeta potential

**P.T.O.**

## SECTION - II

**Q4)** Explain penetration of drug through skin and explain the factors affecting it. **[10]**

OR

Explain in detail safety evaluation testing for semisolid dermatological formulations. Write a note on skin irritation test.

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

- a) Describe layout for manufacturing of suspension as per Schedule M.
- b) Describe formulation aspect of creams.
- c) Describe in vivo methods for studying drug penetration/diffusion through skin.
- d) Describe equipments used for large scale manufacturing of semisolids.
- e) Describe ointment bases with appropriate examples.
- f) Explain in brief evaluation parameters of semisolids
- g) Explain role of colloid mill in the manufacturing of disperse system.

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

- a) Cold cream Vs Vanishing cream
- b) Penetration enhancer
- c) Rheology of gels
- d) Preservation of semisolids



Total No. of Questions : 6]

SEAT No. :

P1640

[Total No. of Pages : 2

[5345]-602

T.Y. B.Pharmacy

PHARMACEUTICAL ANALYSIS - IV

(Semester - VI) (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.*
- 3) *Figures to the right indicate full marks*

**SECTION - I**

**Q1)** Discuss the principle, instrumentation and developments of Electrophoresis. [10]

OR

Explain the factors influencing HPTLC Separation. Discuss the instrumentation and applications of HPTLC system.

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

- a) Explain Van Deemter equation.
- b) Discuss principle of Electrophoresis.
- c) Write the factors affecting efficiency of a column.
- d) Discuss different types of plates used in HPTLC.
- e) Compare between TLC and HPTLC.
- f) Write various principles of separation involved in chromatography.
- g) Discuss important applications of column chromatography.

**Q3)** Write a note on any two of the following [10]

- a) Development of TLC and its evaluation.
- b) Differential Scanning Calorimetry.
- c) "System Suitability Parameters" in chromatography.
- d) Developments and applications of Electrophoresis.

**P.T.O.**

## SECTION - II

**Q4)** Describe the steps of equipment qualification. **[10]**

OR

Discuss method validation parameters for limit tests for impurities.

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

- a) Explain the term URS with suitable examples.
- b) What are the methods of determination of Accuracy?
- c) Write principle of DTA
- d) What are sample characteristics affecting TGA results?
- e) Explain with suitable example, how TGA helps to decide the drying temperature.
- f) Enlist components of DTA apparatus
- g) Write applications of Isothermal Titration Calorimetry

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

- a) Applications of X-ray diffraction
- b) Types of Thermobalances
- c) Particles emitted in radioactive decay
- d) The Geiger Tube



Total No. of Questions : 6]

SEAT No. :

P1641

[Total No. of Pages : 2

**[5345]-603**  
**T.Y.B.Pharmacy**  
**MEDICINAL CHEMISTRY - II**  
**(Semester - VI) (2013 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:-*

- 1) *All questions are compulsory*
- 2) *Draw structures wherever necessary.*

**SECTION - I**

**Q1)** Classify anti hyperglycemics? Describe SAR, mode of action & uses of Sulfonyl ureas. **[10]**

OR

Classify Sedative & Hypnotics. Discuss SAR, mode of action & uses of barbiturates.

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

- a) Classify General anesthetics with one structure of drug from each class
- b) Give structures MOA of any two analeptic drugs
- c) Draw synthesis of Thiopental Sodium.
- d) Write structure MOA & uses of Phenytoin
- e) Explain piperidine derivatives as sedatives.
- f) Explain Glucuronoid conjugation reactions with suitable example
- g) Write a note on metabolism of Diazepam

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

- a) Write a note on general structural features of Anticonvulsants.
- b) Explain phase I reactions using suitable examples.
- c) Write classification of Local anesthetics & add a note on Esters type of drugs.
- d) Write synthesis MOA & uses of metformin

**P.T.O.**

## SECTION - II

**Q4)** Classify anti alzheimers and write structure of one drug from each class.[10]

OR

Classify antipsychotics and write structure of one drug from each class.

**Q5)** Attempt any Five **[15]**

- a) Write synthesis of Haloperidol
- b) Justify use of MAO-B inhibitors over MAO-A inhibitors in Parkinson's treatment.
- c) Explain metabolism of Procaine
- d) Write chemistry of Hydantoins with structures of drugs.
- e) Write synthesis of Chlorpromazine.
- f) Write synthesis of Amantadine.
- g) Write synthesis of Diazepam.

**Q6)** Attempt any Two **[10]**

- a) Write a note on Radio Opaque agents.
- b) Discuss SAR of tricyclic antidepressant agents.
- c) Write SAR of benzo diazepines with liberal use of examples.
- d) Explain the factors influencing drug metabolism.



Total No. of Questions : 6]

SEAT No. :

P1642

[Total No. of Pages : 2

[5345]-604

T.Y.B.Pharmacy

3.6.4. - PHARMACOLOGY - III

(Semester - VI) (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.
- 3) Neat labeled diagrams must be drawn wherever necessary
- 4) Black figures to the right indicate full marks.

**SECTION - I**

**Q1)** Classify anti-Parkinsonian drugs. Write pharmacological account of levodopa and carbidopa. **[10]**

OR

Write pharmacokinetics and pharmacodynamics of Ethanol. Discuss the treatment of alcoholism.

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

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

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

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

**P.T.O.**



## SECTION - II

**Q4)** Write Pharmacological account of emetics and anti-emetics **[10]**

OR

Classify NSAIDS and write pharmacological details of Paracetamol

**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 diarrhoea
- c) Classify H<sub>2</sub> receptor antagonists and write their Uses
- d) Write a note on mucolytics
- e) How would you treat the infection caused by H.pylori
- f) Define and classify anti-emetics along with their clinical uses
- g) Write a note on mucosal defense enhancers

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

- a) Write pharmacotherapy of cough
- b) Write Pharmacotherapy of COPD and add a note on  $\beta$ -agonists
- c) MOA, ADR and Uses of any Ibuprofen, Omeprazole Naloxone
- d) Explain pharmacotherapy of Rheumatoid arthritis



Total No. of Questions : 6]

SEAT No. :

P1643

[Total No. of Pages : 2

**[5345]-605**  
**T.Y.B.Pharmacy**  
**NATURAL PRODUCT CHEMISTRY**  
**(Semester - VI) (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.*
- 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 are different spectroscopic methods of characterization? Explain the significance UV and IR spectroscopy with respect to natural products characterization.
- b) What do you mean by carbon skeleton of natural product? How will you determine the carbon skeleton of natural products by chemical method? Describe each method with example.

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

- a) Discuss the advantages of tracer techniques.
- b) Explain Principle of Thin Layer chromatography.
- c) Give the applications of elucidation of biogenetic pathway.
- d) Give the importance of rates of reactions.
- e) Explain Optical rotation and Circular Dichroism.
- f) What is R<sub>f</sub> value? Give applications of HPTLC.
- g) What is Ozonolysis?

**P.T.O.**

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

- a) What are the various techniques used to investigate the biosynthetic pathways? Describe any one of them
- b) Explain spectral methods for structural elucidation of flavonoids
- c) Give principle and applications of proton NMR.
- d) Explain elemental composition by combustion analysis.

## SECTION - II

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

- a) Write a detailed note on use of Natural products as Pharmaceutical excipients.
- b) Explain the role of marine drugs in healthcare. Add a note on anti-cancer marine drugs.

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

- a) Comment on Liquorice.
- b) What is the difference between nutritive and non-nutritive sweeteners.
- c) Classify colorants and give their chemical properties.
- d) Write a note on Beet and Indigo dyes.
- e) Write B.S, C.C, & uses of Henna.
- f) Comment on Turmeric.
- g) Define secondary plant metabolites with examples.

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

- a) What are natural sweeteners? Explain with examples
- b) Write a detailed note on natural colorants.
- c) Elaborate on cardiovascular agents from marine source
- d) Write in detail about contribution of natural products in new drug discovery.



Total No. of Questions : 6]

SEAT No. :

P1644

[Total No. of Pages : 2

**[5345]-606**  
**T.Y.B.Pharmacy**  
**BIO ORGANIC CHEMISTRY & DRUG DESIGN**  
**(Semester - VI) (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.*
- 3) Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** What are receptors? Explain the structure and function of following receptors:

- a) GABA receptor **[10]**
- b) Adrenergic receptors

OR

Explain in detail various drug — target interactions observed in molecular recognition.

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

- a) Explain role of human Factor Xa
- b) Explain mechanism of action of drugs acting on PPAR  $\gamma$
- c) Explain Molecular adaptation
- d) Discuss HMG CoA reductase inhibitors
- e) Write about dopamine receptors and enlist their antagonists
- f) Explain hydrolytic cleavage of strand breaking
- g) Explain role of Phosphofructokinase enzyme

**P.T.O.**

**Q3)** Answer any two of following [10]

- a) Write a note on COX enzyme and their inhibitors
- b) Explain folate pathway and give significance of DHFR enzyme in drug design.
- c) Explain complexation mechanism of Drug-DNA interaction
- d) Explain how Captopril is discovered as ACE inhibitor.

### **SECTION - II**

**Q4)** Explain QSAR. Discuss the various parameters commonly used in QSAR. [10]

OR

Explain various steps employed in lead identification

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

- a) Write a note on Molecular modeling
- b) Write a note on Molecular Docking
- c) Write a note on structure based drug design
- d) Explain Pharmacophore model
- e) Explain 3D-QSAR techniques.
- f) Write a note on Molecular mechanics
- g) Write applications of prodrug

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

- a) Write a note on virtual screening
- b) Explain Quantum mechanics
- c) Classify prodrugs. Give examples of any two prodrugs
- d) Write about history of QSAR



Total No. of Questions : 6]

SEAT No. :

P1645

[Total No. of Pages : 2

[5345]-607

**T.Y. B.Pharmacy (Semester - VI)**  
**PHARMACEUTICAL BIOTECHNOLOGY**  
**(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 books.*
- 3) *Neat diagrams as well as flow-charts must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Give the principle of r-DNA technology along with significance of enzymes. Enlist and explain various methods of screening the recombinants. **[10]**

OR

Define Biotechnology.

Write a detailed account on scope, potential and achievements of biotechnology to pharmaceutical sciences.

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

- a) Enlist different genetic engineering techniques. Add a note on genomic library.
- b) Explain steps involved in isolation of DNA.
- c) What is gene transfer? Enlist methods of gene transfer and explain *any one* of them
- d) Give benefits and method of preparation of cDNA.
- e) Explain principle and applications involved in southern blotting.
- f) Describe alkaline phosphatase in gene cloning as modifying enzyme in brief.
- g) Enumerate types of cloning vectors. Add a note on YAC as vector.

**P.T.O.**

**Q3)** Write short notes on Any Two of the following: [10]

- a) Gene sequencing
- b) Human gene therapy
- c) RFLP
- d) Expression vector

**SECTION - II**

**Q4)** What do you mean by *hybridoma technology*? Explain steps involved in monoclonal antibodies production and its applications. [10]

OR

Explain benefits of recombinant DNA products.

Write a detailed account on human insulin production by rDNA technology.

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

- a) What is enzyme immobilization? Give applications of Enzyme immobilization.
- b) Explain methods of germplasm storage.
- c) Describe components and working of fermentor.
- d) Give benefits of transgenic animals with suitable examples
- e) How to control foam during fermentation
- f) Explain the process of manufacturing of antibiotic by fermentation with suitable example.
- g) Give role of HAT medium in monoclonal antibody production.

**Q6)** Write short notes on ANY TWO of the following [10]

- a) Down stream processing
- b) Interferon production by rDNA
- c) Production of vitamin by fermentation
- d) Human Gene therapy



Total No. of Questions : 6]

SEAT No. :

P1646

[Total No. of Pages : 2

**[5345]-701**  
**F.Y.B.Pharmacy**  
**STERILE PRODUCTS**  
**(Semester - VII) (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 books.*
- 3) Neat diagrams must be drawn wherever necessary*
- 4) Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Explain in detail HAVAC system for preparation of parenteral products. [10]

OR

Explain in detail quality control and evaluation tests for glass and plastic containers.

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

- a) Write the importance of tonicity adjustment in parenteral formulation.
- b) Write the advantages of prefilled syringes.
- c) Draw the parenteral production process flow diagram.
- d) What is reconstituted products? Explain.
- e) How will you validate HEPA filter.
- f) Explain in short various solvents used in formulations of SVPs
- g) Explain in short filling area design for parenterals.

**Q3)** Write notes on (Any two) [10]

- a) Preformulation of sterile products.
- b) Composition of SVPs
- c) Parenteral suspensions.
- d) Pyrogen test.

**P.T.O.**



## SECTION - II

**Q4)** Explain in detail the influence of different parameters in the development of LVPs. **[10]**

OR

What is freezing? Explain different steps involved in freeze drying process.

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

- a) Write the ideal properties of surgical dressings.
- b) Explain in short quality control of blood products.
- c) Define and classify ophthalmic products.
- d) Write the importance of electrolyte solutions.
- e) Explain the applications of freeze drying process.
- f) Write in short composition of ophthalmic products
- g) Write the importance and types of surgical bandages.

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

- a) Standards of catgut.
- b) Plasma volume expanders
- c) Contact lens.
- d) Peritoneal dialysis fluid.



Total No. of Questions : 6]

SEAT No. :

P1647

[Total No. of Pages : 2

[5345]-702

F.Y.B.Pharmacy

PHARMACEUTICAL ANALYSIS - V  
(Semester - VII) (2013 Pattern) (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 principle, instrumentation and advantages of NIR technique. [10]

OR

Describe principle, instrumentation and applications of SEM technique.

Q2) Attempt any five of the following [15]

- a) Compare dispersive and nondispersive IR techniques.
- b) What are the advantages of Raman techniques?
- c) Compare SEM and TEM techniques.
- d) Explain principle of TEM.
- e) Explain fingerprint IR region.
- f) Explain importance of stretching vibrations in IR structural interpretation.
- g) Explain advantages of FTIR technique.

Q3) Attempt any two of the following [10]

- a) Explain characteristic IR bands of aromatic compounds.
- b) Discuss construction and working of dispersive IR instrument.
- c) Discuss use of IR technique as sensor.
- d) Discuss working of TEM instrument.

P.T.O.

## SECTION - II

**Q4)** Discuss instrumentation, working and applications of Super Critical Fluid Chromatography. **[10]**

OR

Explain the principle of Gas Chromatography (GC). Discuss various stationary and mobile phases used in this technique.

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

- a) Write important applications of GC.
- b) Write principle of Atomic Emission Spectroscopy.
- c) Discuss theory of Super Critical Fluid extraction.
- d) Give applications of Flash Chromatography.
- e) Discuss any one detector used in GC.
- f) Write principle of Super Critical Fluid Chromatography.
- g) Discuss derivatisation in GC.

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

- a) Working of Flash Chromatography
- b) Applications of Atomic Emission Spectroscopy
- c) Internal standard and External standard method
- d) Instrumentation of Atomic Emission Spectroscopy



Total No. of Questions : 6]

SEAT No. :

P1648

[Total No. of Pages : 2

**[5345]-703**  
**F.Y.B.Pharmacy**  
**MEDICINAL CHEMISTRY - III**  
**(Semester - VII) (2013 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:-*

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

**SECTION - I**

**Q1)** Classify NSAIDs with examples. Give an account of salicylates and propionic acids as NSAIDs. **[10]**

OR

Classify H<sub>1</sub> receptor antagonists with examples. Give the SAR of H<sub>1</sub> receptor antagonists.

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

- a) Give the structure and mechanism of action of Diclofenac and Diphenhydramine.
- b) Give the scheme of synthesis of Propoxyphen.
- c) Give the SAR of benzomorphans.
- d) Give the biosynthesis and metabolism of hydrocortisone.
- e) Write in short about H<sub>2</sub> antagonists.
- f) Give an account of COX inhibitors.
- g) Give an account of opioid antagonists.

**P.T.O.**

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

- a) Write a note on opioid receptors along with mechanism of action.
- b) Sketch the scheme of synthesis of Piroxicam and Methadone.
- c) Give an account of prostaglandins.
- d) Give the SAR of morphine class of opioids.

### SECTION - II

**Q4)** What are expectorants? Classify with examples and give the mechanism of action. Give the synthesis of Guiaphenesin. [10]

OR

Which are the various respiratory tract disorders? Classify with examples and mechanism of action of antiasthmatic agents.

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

- a) Give the structure and mechanism of action of Ambroxal and Dextromethorphan.
- b) Give the scheme of synthesis of Omeprazole.
- c) What are prokinetic drugs? Explain with examples and give mechanism of action.
- d) Classify with examples the drugs used in treatment of peptic ulcer.
- e) Classify antiemetic agents with examples, mechanism of action and SAR.
- f) What are opioid antidiarrhoeals? Give mechanism of action and SAR.
- g) Classify the drugs used in treatment of Irritable bowel syndrome.

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

- a) Antispasmodics.
- b) Proton pump inhibitors.
- c) Mucolytic agents.
- d) Drugs used in treatment of constipation.



Total No. of Questions : 6]

SEAT No. :

P1736

[Total No. of Pages : 2

[5345]-704

Final Year B.Pharmacy (Semester - VII)

PHARMACOLOGY - IV

(2013 Pattern)

*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)** Classify antibiotics according to the mechanism of action. Explain mode of action, therapeutic uses and adverse effects of Penicillin G. **[10]**

OR

Classify antimalarial agents. Explain in detail mode of action and adverse effects of three commonly used drugs in malaria. **[10]**

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

- a) Explain the mechanism of action and therapeutic uses of fluroquinolones.
- b) What are the adverse effects of aminoglycoside antibiotics?
- c) Discuss rationale of using sulphamethoxazole with trimethoprim?
- d) Explain role of hormones in treatment of cancer.
- e) Classify cephaolsporins with examples.
- f) Explain mechanism of action and adverse effects of tetracyclines.
- g) Classify antiviral agents with examples.

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

- a) Explain various mechanisms for development of drug resistance.
- b) DOT therapy
- c) Antimetabolites used in cancer therapy
- d) Sulfonamides.

**P.T.O.**

## SECTION - II

**Q4)** Classify anti-arrhythmic agents. Explain mode of action, therapeutic uses and adverse effects of beta blockers. **[10]**

OR

Classify antihypertensive agents. Explain mode of action, therapeutic uses and adverse effects of calcium channel blockers. **[10]**

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

- a) Explain role of nitrates in the treatment angina pectoris?
- b) Classify diuretics with examples.
- c) Explain mode of action and therapeutic uses of digitalis glycosides.
- d) Explain role of aspirin in myocardial infarction.
- e) Differentiate between oral and parenteral anticoagulants.
- f) Classify anti-hyperlipidemic agents with examples.
- g) Explain mode of action and therapeutic uses of ACE inhibitors.

**Q6)** Write short notes on ANY TWO. **[10]**

- a) Hemopoietics.
- b) Safety pharmacology.
- c) Bile acid sequestrants.
- d) Thiazide diuretics.



Total No. of Questions : 6]

SEAT No. :

P1650

[Total No. of Pages : 2

[5345]-705

**Fourth Year B.Pharmacy (Semester - VII)**

**4.7.5 : NATURAL DRUG TECHNOLOGY**

**(2013 Pattern) (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 Right indicate full marks.*

**SECTION - I**

**Q1) What are WHO guidelines for GACP. [10]**

OR

Emphasize on Post Harvesting Storage of Crude Drugs with special reference to WHO Guidelines on Good Storage Practices of Pharmaceuticals. [10]

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

- a) Explain Taila as Ayurvedic formulation.
- b) What is System Biology Approach?
- c) Describe the Need of Authentication.
- d) Explain Siddha System of Medicine.
- e) Explain the Method of Evaluation for Churna.
- f) Give Justification about Expiry Date of Asava and Arishta.
- g) Enlist Ashtadhatu's, Panchmahabhuta's and Triguna's in Ayurveda.

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

- a) Methods to Control infestation during Storage of Crude Drugs.
- b) Current Approaches in Standardization of Herbal Drugs.
- c) DNA Fingerprinting in Plants.
- d) Homeopathy.

**P.T.O.**



## SECTION - II

**Q4)** What are Prebiotics and Probiotics? Explain in detail about Soya Products as Dietary Supplements. **[10]**

OR

Elaborate Novel Drug Delivery Systems for Herbal Drugs. **[10]**

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

- a) Explain the Role of Corn Protein in Wound Management.
- b) Describe Citronella as Natural Pesticide.
- c) Describe the Radiation Protection Agents.
- d) Describe the Importance of Essential Oils in Skin Permeation Enhancers.
- e) Give a Brief Account of Proanthocyanidins.
- f) Explain Digestive Enzymes.
- g) How 'Aloe vera' is useful in Herbal Cosmetics?

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

- a) Evaluation of Skin Cosmetics.
- b) Significance of Biofuels in National Economy.
- c) Classification of Natural Pesticides and Methods of Pest Control.
- d) Comment on PUFA.



Total No. of Questions : 6]

SEAT No. :

P1651

[Total No. of Pages : 2

[5345]-706

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) 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 influence of dosage forms on oral absorption of drugs. [10]

OR

Define distribution of drug. Discuss various factors affecting distribution of drug.

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

- a) Buccal and sublingual routes of administration.
- b) Protein binding of drugs.
- c) Enterohepatic cycling of drug.
- d) Phase II reactions and their characteristics.
- e) Salivary excretion.
- f) Absorption via intranasal administration.
- g) Effect of polymorphs on dissolution.

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

- a) Blood Brain barrier.
- b) Renal route of excretion and its influence on drug dosing.
- c) Pre-systemic metabolism of drug.
- d) Non linear Pharmacokinetics.

**P.T.O.**

## SECTION - II

**Q4)** Define Bioavailability and Bioequivalence and explain study designs for conducting bioequivalence study. **[10]**

OR

Explain ONE Compartmental open model for assessment of parameters by IV Bolus administration.

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

- a) What is the meaning of flip flop method for estimation of  $K_a$ ?
- b) What are the advantages of urinary data over plasma data?
- c) How bioavailability determined on the basis of urinary excretion data?
- d) What is Wash out period?
- e) Single verses Multiple dose study.
- f) What are Biowaivers?
- g) What is absolute bioavailability?

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

- a) Wagner Nelson method.
- b) Plasma concentration time profile.
- c) Assessment of Bioavailability.
- d) Compartmental analysis.



Total No. of Questions : 6]

SEAT No. :

P1652

[Total No. of Pages : 2

[5345]-707

Final Year B.Pharmacy

4.7.7 (T) : PHARMACEUTICAL JURISPRUDENCE

(Semester - VII) (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 on separate answer books.
- 3) Neat labelled diagrams must be drawn wherever necessary
- 4) Figures to the right indicate full marks.

**SECTION - I**

**Q1)** State the constitution, working and functions of pharmacy council of India (PCI) according to pharmacy Act, 1948. **[10]**

OR

State the constitution and functions of Drugs Technical Advisory Board (DTAB) & Drug Consultative Committee (DCC) as per Drugs & Cosmetics Act, 1940.

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

- a) Give the objectives of DPCO & explain the formula to calculate retail price of a formulation.
- b) Explain various provisions required for retail sale of drugs.
- c) Write a note on 'Education Regulations' as per pharmacy act, 1948.
- d) Give the objective of prevention of cruelty to Animals Act, 1960.
- e) State the objective of Food Safety & Standards Act, 2011.
- f) Define
  - i) Schedule M
  - ii) Schedule J
- g) Define "Drugs" under Drugs & Magic Remedies Act, 1954.

**P.T.O.**

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

- a) Constitution & functions of central consumer protection council.
- b) Powers and Duties of Drug Inspector.
- c) Controlled operations under Narcotic Drugs & Psychotropic substances Act.
- d) Repacking Licenses.

**SECTION - II**

**Q4)** What are the criteria for patenting an invention? Which types of inventions, in general, are not patentable in patent acts of all the countries? Explain with suitable examples. [10]

OR

What is Patent Co-operation Treaty? What are its advantages? Describe the process of filing a PCT application along with the PCT timelines.

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

- a) Differentiate between product patents and process patents.
- b) What is pre grant opposition? Who can file a pre grant opposition to a patent in India?
- c) What is the significance of para IV filing to a generic company?
- d) What are the remedies available to a patent owner in case of patent infringement?
- e) Where are the patent offices located in India? What are their jurisdictions?
- f) Explain what is an ordinary patent application, convention patent application & provisional patent application.
- g) What was the mail box provision in the Indian patent act? In which amendment of the Indian patent act, this provision was introduced?

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

- a) Section 3(d) of the Indian patent act & its significance to pharmaceutical industry.
- b) Compulsory licensing
- c) USFDA
- d) Trademarks



Total No. of Questions : 6]

SEAT No. :

P1653

[Total No. of Pages : 2

**[5345]-801**  
**F.Y.B.Pharmacy**  
**ADVANCED DRUG DELIVERY SYSTEM**  
**(Semester - VIII) (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.*
- 3) *Neat labeled diagrams must be drawn wherever necessary*
- 4) *Black figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Describe concept of controlled drug delivery system, Prerequisites of drug candidates, explain diffusion based controlled drug delivery system [10]

OR

Explain formulation development and evaluation of colon targeted drug delivery system in detail

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

- a) Give merits and demerits of gastroretentive drug delivery system
- b) What are prebiotics write applications of prebiotics
- c) What are liposomes give its types
- d) Write formula for dose calculation for controlled drug delivery system
- e) Write an account on polymers
- f) What are current related factors in iontophoresis
- g) Factors affecting sonophoretic drug delivery system

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

- a) Osmotic pump
- b) Penetration enhancers
- c) Mucosal drug delivery system
- d) Parenteral implants

**P.T.O.**

## SECTION - II

**Q4)** Describe pharmaceutical aerosols and explain in details components of aerosols [10]

OR

What is microencapsulation. explain merits, demerits of Microencapsulation?  
Explain coaccervation technique in detail.

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

- a) Spheronization technique of Microencapsulation
- b) Advantages and Disadvantages of Aerosols
- c) Explain solution type of Aerosol system
- d) Explain in-situ polymerization technique of Microencapsulation
- e) What is the use of optimization technique in Pharmaceutical Industry
- f) Describe fundamental concept of Microencapsulation
- g) Enlist the Microencapsulation methods

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

- a) Write on Metered dose Aerosol systems
- b) Explain fluidized bed coater method of Microencapsulation
- c) Explain two level factorial design
- d) Write on Foam system of Aerosols



Total No. of Questions : 6]

SEAT No. :

P1654

[Total No. of Pages : 2

**[5345]-802**  
**F.Y.B.Pharmacy**  
**COSMETIC SCIENCE**  
**(Semester - VIII) (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.*
- 3) *Neat labeled diagrams must be drawn wherever necessary*
- 4) *Black figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Discuss in detail about formulation development, manufacturing and evaluation of Lipsticks. **[10]**

OR

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

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

- a) Discuss about perfumes in cosmetics.
- b) Discuss about the formulation of shaving creams.
- c) Discuss about powder rouges.
- d) Discuss formulation aspects of cleansing cream.
- e) What are antiperspirants? Write about liquid antiperspirants.
- f) Discuss formulation aspects of moisturizing cream.
- g) Discuss in brief about quality of water in cosmetic industry.

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

- a) Bath soaps
- b) Compact rouges
- c) Microbial control in cosmetic manufacturing
- d) Face Powder

**P.T.O.**



## SECTION - II

**Q4)** Discuss in detail about ideal properties. components of nail lacquer. Add a note on its manufacturing and evaluation. **[10]**

OR

What are eye makeup preparations? Explain in detail about components of eye liner and eye shadow.

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

- a) What are abrasives? Write in brief about significance of particle size for abrasives.
- b) Explain two types of practices to change the color of hairs.
- c) Discuss disadvantage of sulphides as depilatory; enlist other class of depilatories that are most commonly used, along with their advantages.
- d) Discuss in short about dentifrices.
- e) Differentiate between cosmetics and cosmeceuticals.
- f) Write in brief about composition of mouthwashes.
- g) Discuss about alpha hydroxyl acid as cosmeceuticals.

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

- a) Semi-permanent hair colorants
- b) Eye brow pencil
- c) Baby shampoo
- d) Medicated hair tonics



Total No. of Questions : 6]

SEAT No. :

P1655

[Total No. of Pages : 2

[5345]-803

**F.Y.B.Pharmacy (Semester - VIII)**  
**PHARMACEUTICAL ANALYSIS - VI**  
**(2013 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:-*

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

**SECTION - I**

**Q1)** Discuss the principle of  $^{13}\text{C}$ -NMR. Discuss the instrumentation of conventional 60MHz NMR instrument. **[10]**

OR

Discuss principle, instrumentation and application of Ion exchange chromatography.

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

- a) Differentiate between propanol and Isopropyl alcohol by  $^1\text{H}$ -NMR
- b) Discuss n+1 rule with suitable example.
- c) Significance of Integration of peak in NMR
- d) Discuss  $^1\text{H}$ -NMR spectrum of 1-bromoethane,
- e) Hyperfine Splitting in ESR
- f) Solvents used in NMR Spectroscopy
- g) Give characteristics chemical shift values for Aliphatic, Aromatic, Aldehydic and carboxylic acid Proton  $^1\text{H}$  NMR?

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

- a) Chemical and Magnetic Equivalence with suitable example
- b) Chemical Shift reagents in NMR
- c) Stationary phases in Ion Exchange Chromatography
- d) Capillary electrophoresis

**P.T.O.**

## SECTION - II

**Q4)** Answer the following (Any one)

Discuss in detail quantification techniques in HPLC [10]

OR

Discuss Electron impact and Chemical Ionization in Mass spectrometry.

**Q5)** Answer the following (Any 5)

[15]

- a) Sample injection in HPLC
- b) Applications of Mass Spectroscopy
- c) MS-MS
- d) McLafferty rearrangement in mass spectrometry
- e) RI detector in HPLC
- f) Resolution and number of theoretical plates in HPLC
- g) Why mass spectrometry operated under negative pressure?

**Q6)** Write short note on (Any 2)

[10]

- a) Quadrapole Mass Analyzer
- b) Isotope Ion peaks in mass spectrometry
- c) Trouble shooting of HPLC column issues
- d) Coupling (Interfaces) mechanism used for GC and MS



Total No. of Questions : 6]

SEAT No. :

P1656

[Total No. of Pages : 2

**[5345]-804**  
**F.Y.B.Pharmacy**  
**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 books.*
- 3) *Black figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Classify antineoplastic agents explain alkylating agents and antimetabolites in detail. **[10]**

OR

Classify antiviral agents with suitable example. Give detail account of purine and pyrimidine analogues as antivirals. **[10]**

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

- a) Give the scheme of synthesis of Amodiaquine.
- b) Discuss benzimidazole derivatives as anthelmintic agents.
- c) Discuss chemistry, MOA and uses of azole antifungal agents.
- d) Give the scheme of synthesis of Nevirapine.
- e) Explain general chemistry SAR and MOA of Quinolone antibacterials.
- f) Explain chemistry, MOA and side effects of Antileprotic sulfones.
- g) Give the scheme of synthesis of Melphalan.

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

- a) Antiretroviral agents
- b) Antitubercular agents.
- c) Antiviral agents interfering with Virus Attachment, Penetration, Uncoating, and Early Viral Replication
- d) Antileprotic agents.

**P.T.O.**

## SECTION - II

**Q4)** Write penam and cephem ring system with their chemical names. Discuss chemistry, MOA and SAR of antibiotics containing cephem ring system. [10]

OR

Classify antibiotics on basis of chemical nature. Discuss the mechanism of action and structure activity relationship with examples of Aminoglycoside antibiotics. [10]

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

- a) Give the scheme of synthesis of Metronidazole.
- b) Write a note on GnRH agonist.
- c) Write a note on Aromatase inhibitors.
- d) Give the scheme of synthesis of Isoniazid.
- e) Explain Polypeptide antibiotics.
- f) What are estrogenic agents? Explain Nonsteroidal estrogenic agents in detail.
- g) Give the scheme of synthesis of Cephadroxil.

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

- a) SAR and role of Androgens.
- b) Write chemistry, SAR and mode of action of macrolide antibiotics
- c) SAR and MOA of Chloramphenicol.
- d) Antithyroid agents.



Total No. of Questions : 6]

SEAT No. :

P1657

[Total No. of Pages : 2

[5345]-805

Final Year B.Pharmacy (Semester - VIII)

PHARMACOLOGY - V

(Including Biostatistics)

(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.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Define and classify adverse drug reactions. Discuss hypersensitivity and Idiosyncrasy reactions with suitable example. **[10]**

OR

Classify drug interaction. Explain drug interaction during drug metabolism and excretion with suitable examples.

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

- a) Write the application of stem cell therapy.
- b) Explain drug abuse and drug misuse with suitable example.
- c) Write the advantages of bioavailability and bioequivalence study.
- d) Explain the effect of change in pH during drug absorption with example.
- e) Discuss teratogenicity reaction.
- f) Write drug food interaction with suitable example.
- g) Explain the laboratory tests for liver dysfunction.

**Q3)** Write notes on (Any two) **[10]**

- a) Application and importance of Gene therapy.
- b) Detection and reporting of ADR.
- c) Pharmacodynamic drug interaction.
- d) Advantages and applications of Therapeutic Drug Monitoring (TDM).

**P.T.O.**

## SECTION - II

**Q4)** Define clinical trials. Write its types and discuss in brief about different phases of Clinical Trials. **[10]**

OR

Explain the essential components of hospital formulary in hospital pharmacy.

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

- a) Discuss the process of patient recruitment in clinical trials.
- b) Define case report form, comparative study and controlled study.
- c) Explain bed side pharmacy and floor ward stock system.
- d) What is mean by patient compliance? Write the reasons for patient non compliance.
- e) Write the process of Blinded study.
- f) Explain the necessary requirements for handling of investigational products.
- g) Write the importance of declaration of Helsinki.

**Q6)** Write notes on (Any two) **[10]**

- a) CRO in clinical trials.
- b) Special consideration in informed consent.
- c) Centralized and decentralized drug distribution system.
- d) Role and Responsibilities of IRB.



Total No. of Questions : 6]

SEAT No. :

P1658

[Total No. of Pages : 2

**[5345]-806**  
**F.Y.B.Pharmacy**  
**NATURAL PRODUCTS : COMMERCE, INDUSTRY &**  
**REGULATIONS**  
**(Semester - VIII) (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.*
- 3) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Solve any one: **[10]**  
Write in detail about global and domestic market size of traditional medicinal products.

OR

Write an exhaustive note on Government agencies involved in development and promotion, promotional policy for entrepreneurship development.

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

- a) Add a note on potential spices exported from India.
- b) Write in brief the demand and supply position of phytopharmaceuticals.
- c) Write a note on major herbs and herbal extracts exported from India.
- d) Add a note on export and import of traditional medicinal products.
- e) Write the significance of biofuels in national economy.
- f) Classify essential oil market on the basis of their application.
- g) Enlist the list of medicinal plants with respect to their high market potential.

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

- a) Write a note on technical and funding assistance schemes.
- b) Comments on leading manufacturers of herbal drugs in India.
- c) Write in detail about the important plants used in indigenous system of medicine.
- d) Add a note on domestic and global market for OTC products.

**P.T.O.**



## SECTION - II

**Q4)** Solve any one: **[10]**  
Define and classify plant allergens. Explain in detail method of preparation of allergenic extracts.

OR

Enlist various ways of herbal toxicity. Describe the toxic reactions and interactions of Garlic with other drugs.

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

- a) Explain roll of health care providers in monitoring adverse drug reactions.
- b) Explain method of preparation of allergenic extract.
- c) Write a toxicity and drug interaction of liquorice.
- d) Write in brief about the need of Pharmacovigilance.
- e) Write drug interactions of Cinchona.
- f) Write appropriate method for safety monitoring of herbal medicines.
- g) Describe the mechanism of allergenic reaction.

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

- a) Explain the meaning and significance of Pharmacovigilance of herbal medicines.
- b) Write in detail about the toxicity and drug interaction of Digitalis.
- c) Add a brief note on inhalant allergens.
- d) Write a note on application of allergens in diagnosis & treatment.



Total No. of Questions : 6]

SEAT No. :

P1659

[Total No. of Pages : 2

**[5345]-807**  
**F.Y.B.Pharmacy**  
**QUALITY ASSURANCE TECHNIQUES**  
**(Semester - VIII) (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.*
- 3) Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** Explain prospective, concurrent, retrospective and revalidation. ` [10]

OR

Discuss quality control. Explain major components of quality control.

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

- a) Explain validation of steam sterilization.
- b) Discuss importance of statistical quality control
- c) Explain types of validation
- d) Discuss IQ.
- e) Write importance of QA.
- f) Give the importance of QBD.
- g) Write quality control of raw materials.

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

- a) URS and DQ
- b) Cleaning validation of equipment.
- c) VMP
- d) Quality Audits

**P.T.O.**

## SECTION - II

**Q4)** Elaborate on master production and control records. **[10]**

OR

Requirements of organization and personnel as per USFDA.

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

- a) Explain Storage Conditions in stability testing of new drug.
- b) Write the contents and importance of equipment log.
- c) Enlist the requirement of qualification and experience of personnel in cGMP.
- d) Elaborate on Handling of rejected material.
- e) Explain Design, size and location for equipment.
- f) State Importance of staff training.
- g) Explain Sewage disposal in manufacturing plant

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

- a) GMP issues for personnel
- b) Management of rejected and recovered material in pharmaceutical processing
- c) Functions of QA department in Pharmaceutical organization
- d) SOP on records of Calibration

