

Total No. of Questions : 6]

SEAT No. :

P2238

[Total No. of Pages : 2

**[5145] -101**  
**F.Y.B.Pharmacy (Semester -I)**  
**111T PHARMACEUTICS-I**  
**(2013 Pattern)**

*Time : 3 Hours]*

*[Maximum 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 side indicate full marks.*

**SECTION -I**

**Q1)** Attempt any one

**[10]**

Classify the dosage form and Explain different routes of drug administration in brief.

OR

How excipients are classified? Add a note on flavours and colors used in pharmaceuticals.

**Q2)** Attempt any five

**[15]**

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

**P.T.O**

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

- a) Pharmacy code of ethics
- b) Principle of Siddha and Unani
- c) Scope of Hospital Pharmacy
- d) U.S.P.

**SECTION -II**

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

Discuss in detail formulation aspect of Pharmaceutical solutions.

OR

Discuss physicochemical properties to be studied for preformulation of liquid dosage form.

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

- a) Write difference between quality control and quality assurance.
- b) Discuss formulation of simple linctus and give direction for its administration.
- c) Why excessive heating of glycerin is avoided during preparation of paints?
- d) Why excipients are used along with drug to formulate dosage form?
- e) Write importance of stability study.
- f) Explain mechanism of solubilization of dill oil in concentrated Dill Water I.P.
- g) Discuss quality control test for solutions.

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

- a) Sweeteners in pharmaceuticals
- b) Concept of Quality Assurance
- c) Enema
- d) Bulk drug characterization



Total No. of Questions : 6]

SEAT No. :

**P1966**

**[5145]-102**

[Total No. of Pages : 2

**F.Y.B.Pharmacy**

**112 : MODERN DISPENSING PRACTICES**

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

**SECTION - I**

**Q1)** Answer in detail any one: **[10]**

- a) Explain different steps in compounding.
- b) Define Prescription and explain parts of prescription.

**Q2)** Attempt in brief. (Solve any five) **[15]**

- a) Comment on Personnel and housekeeping with respect to compounding.
- b) Explain stability of Dispensed Medicines.
- c) What is the proof strength of 80% v/v and 45% v/v ethanol?
- d) What are the content and advantages of Cash Memo?
- e) Explain labeling of dispensed product.
- f) Write the importance of pictograms with example.
- g) Explain errors in prescription.

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

- a) Explain in detail patient medication record.
- b) Write a note on storage of dispensed medication.
- c) Discuss Purchase and Stock record.
- d) Write a note on Different formulas for calculation of Child does.

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

## SECTION - II

**Q4)** Answer any one from the following: **[10]**

- a) Define posology and Factors affecting the dose.
- b) Write in detail chemical incompatibility.

**Q5)** Answer in brief. (Solve any Five) **[15]**

- a) Explain idiosyncrasy.
- b) Write a note on rationale use of drugs.
- c) What are Dispensing errors?
- d) Explain precaution to be taken by diabetic patient.
- e) Explain in detail Self Medication.
- f) Write the formulas for the calculation of dose depending upon age.
- g) Write a note on patient counseling for tuberculosis.

**Q6)** Answer any two from following: **[10]**

- a) Explain in brief Code of Ethics.
- b) Explain role of pharmacist in Family planning.
- c) Explain the steps and importance of patient counseling.
- d) Write a note on Pharmacovigilance.

**x      x      x**

Total No. of Questions : 6]

SEAT No. :

**P1967**

**[5145]-103**

[Total No. of Pages : 3

**F.Y. 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) Write in detail the different sources of Impurities in Pharmaceuticals.
- b) Explain Limit test of Iron and Lead in detail.

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

- a) Write a note on ORS.
- b) Discuss the role of Potassium and chloride in our body.
- c) Explain why combination of Aluminium and Magnesium antacid is used?
- d) Define Monograph. Write in brief storage conditions as per I.P.
- e) Write brief history of Indian Pharmacopoeia.
- f) Why water is called as universal pharmaceutical vehicle?
- g) Give the properties and uses of Titanium Dioxide as topical protectives.
- h) What are Antidepressants? Explain Lithium Carbonate as inorganic antidepressant.

**P.T.O.**

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

- a) Explain GIT protective and Adsorbent along with one example each.
- b) Write a note on electrolytes used in Acid Base Therapy.
- c) Discuss official control test of water.
- d) Write Physiological role of Copper and Iodine.

### **SECTION - II**

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

- a) What are topical agents? Explain mechanism of action of Antimicrobial agents. Discuss Preparation Properties, assay and uses of Hydrogen Peroxide.
- b) Define and classify Antacids. Explain ideal properties of Antacids. How they are evaluated. Write properties and uses of calcium carbonate and Magnesium Hydroxide.

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

- a) Define along with examples-i) Anticaries agents, ii) Astringents, iii) Antidotes.
- b) Write storage and labeling conditions for Nitrogen, Nitrous oxide and Helium as inorganic gases.
- c) Write short note on properties and uses of sodium thiosulphate
- d) Write in brief about Sodium Fluoride as Anticaries agent.
- e) Write a note on Zinc as trace ion.
- f) Define Hardness of Water. Enlist methods used to remove temporary and permanent hardness of water
- g) Explain role of lead acetate cotton plug in limit test for Arsenic.

**Q6)** Solve any TWO of the following:

**[10]**

- a) Explain Barium Sulphate as Radio opaque Contrast Media.
- b) Write a note on Aluminium Chloride as an expectorant.
- c) Explain Properties and uses of Oxygen and Carbon dioxide as official Inorganic gas.
- d) What are topical protective agents? Explain in detail Talc and Zinc oxide as protectives.



Total No. of Questions :6]

SEAT No. :

P1968

[Total No. of Pages :4

[5145] - 104

F.Y.B. Pharmacy

114: 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**

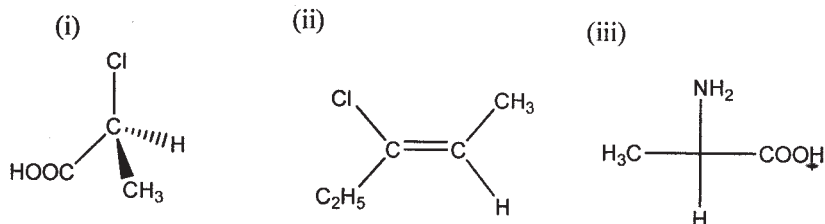
**Q1)** What are elimination reactions? Explain mechanism, stereochemistry of  $E_1$  and  $E_2$  reactions. Compare  $E_1$  and  $E_2$  mechanism [10]

OR

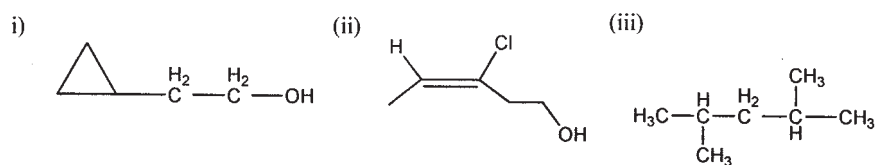
Explain any five factors affecting electron availability? [10]

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

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



b) Write IUPAC names for following structures



P.T.O.



- c) Write any three reactions of alkanes.
- d) Define following terms with suitable examples:
  - i) Carbocation
  - ii) Carbanion
  - iii) Electrophile
- e) Tertiary carbocations are more stable than secondary carbocations explain.
- f) Explain Tautomerism with example.
- g) Draw resonating structures of any two from following:
  - i) Aniline
  - ii) Nitrobenzene
  - iii) Benzoic acid

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

- a) Explain the addition-elimination and elimination-addition mechanisms of nucleophilic aromatic substitution.
- b) Define hybridization. Mention different types of hybridization? Explain  $sp^2$  hybridization.
- c) Classify organic compounds on the basis of elemental composition (at least five classes with suitable examples).
- d) Explain with example
  - i) Homolytic bond fission
  - ii) Heterolytic bond fission

## SECTION -II

**Q4)** a) Define isomerism? Explain any three types of isomerism with examples. [10]

b) Explain types of chemical reactions with suitable examples.

OR

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

a)  $-\text{OH}$     b)  $-\text{CH}_3$     c)  $-\text{COOH}$     d)  $-\text{NO}_2$

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

a) Arrange following in order of increasing acidity with explanation

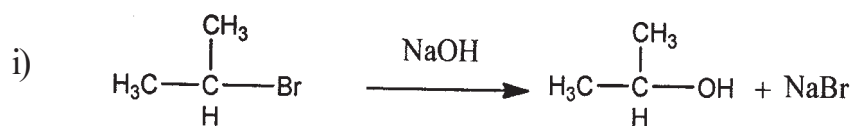
- i) Acetic acid
- ii) Trichloroacetic acid
- iii) Chloroacetic acid

b) Explain Saytzeff rule for 1, 2 elimination reaction?

c) Write a note on ozonolysis.

d) Explain mechanism of  $\text{E}_1$  CB reaction.

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



f) Draw structures from IUPAC names of following:

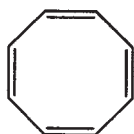
i) 4-nitro aniline

ii) 2-chloropropanoic acid

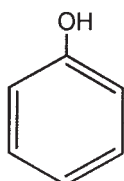
iii) 2-Pentanone

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

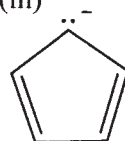
i)



(ii)



(iii)



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

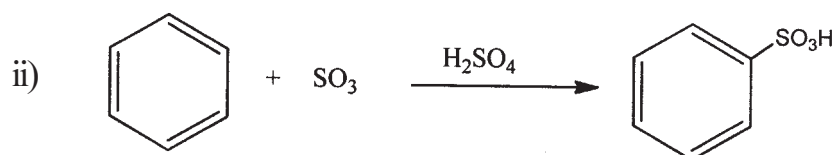
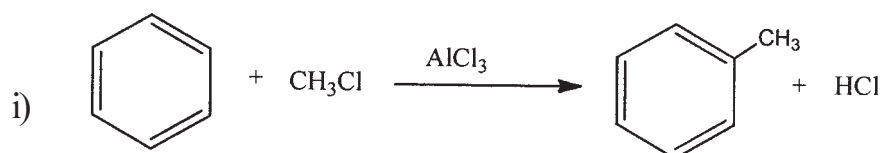
**[10]**

a) Explain inter and Intra molecular forces of attraction.

b) What are alkynes? Write their any two methods of preparation and two reactions.

c) State and explain Markovnikov and Anti Markonikov Rule.

d) Write down the stepwise mechanism for following reactions



*EEE*

Total No. of Questions : 6]

SEAT No :

**P1969**

**[5145]-105**

[Total No. of Pages :2

**First Year B.Pharmacy**

**1.1.5: HUMAN ANATOMY & 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)** Classify and explain different types of muscle tissues with their properties and functions. Discuss in detail anatomy & physiology of skeletal muscles.[10]

OR

Discuss in detail anatomy, physiology & life cycle of erythrocytes.

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

- a) Explain the structure and functions of cytoskeleton.
- b) Describe the structure and functions of endoplasmic reticulum.
- c) Add an account on thrombocytes.
- d) Explain the composition and functions of blood.
- e) Explain events of interphase of cell division.
- f) Define the terms Anemia, Polycythemia and Inflammation.
- g) Explain the components of feedback system.

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

- a) Transport across plasma membrane.
- b) Platelet plug formation.
- c) Protein synthesis.
- d) WBCs.

**P.T.O.**

## SECTION-II

**Q4)** Explain composition, formation and circulation of lymph. Add note on spleen. **[10]**

OR

Draw neat labeled diagram of digestive system. Explain in detail location, anatomy, histology and functions of small intestine.

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

- a) Write a note on AV valves.
- b) Discuss the role of baroreceptors in regulation of blood pressure.
- c) Describe the structure of salivary glands.
- d) Explain structure of lymph node.
- e) Discuss conduction system of heart.
- f) Define the terms hypertension, myocardial infarction and congestive heart failure.
- g) Explain the structure and functions of liver.

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

- a) Renin-angiotensin-aldosterone system.
- b) Structure of Blood vessels.
- c) Stomach: Anatomy, Histology and functions.
- d) Electro-cardiogram (ECG).



Total No. of Questions : 6]

SEAT No. :

**P1970**

**[5145]-106**

[Total No. of Pages : 2

**F.Y. B.Pharmacy**

**1.1.6: COMMUNICATION & SOFT SKILL DEVELOPMENT  
(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)** Answer any one.

**[10]**

- a) Explain various parts of a business letter. Explain purpose and qualities of a business correspondence.
- b) Explain principles of developing effective messages with regards to thinking about purpose, knowing the audience, structuring the message, selecting proper channels and minimizing barriers.

**Q2)** Answer any five.

**[15]**

- a) Explain the objective and need for communication.
- b) State the importance of body language in communication.
- c) Explain different types of commercial correspondence and their drafting.
- d) Write a note on summary and abstract of a formal report.
- e) Write a note on use of charts, graphs and tables for effective writing.
- f) Differentiate between objective style and literary composition.
- g) Write a note on case writing.

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

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

- a) Explain electronic communication process.
- b) What are common barriers that make communication ineffective?
- c) Write a note on expressing ideas with minimum word limit.
- d) Why it is essential to maintain variety in sentences and paragraphs in written communication?

**SECTION - II**

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

- a) Enlist different types of business correspondence and explain any one in details.
- b) Explain scope and significance of soft skills, and write in details about emotional intelligence.

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

- a) Write a note on complaint letter with example.
- b) Write a note on e-mail writing and e-mail etiquette.
- c) Give scope and significance of negotiation skills.
- d) Write a note on tele and video conferencing.
- e) Give a note on empathy and reflective thinking.
- f) Write an order letter with example.
- g) Write a note on resume and effective profiling.

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

- a) Write a note on globalization in business with respect to information technology.
- b) Give salient feature of inter and intra personal skills.
- c) Write a detail note on interview skills.
- d) Write a note on critical thinking.



Total No. of Questions : 6]

SEAT No. :

**P1971**

**[5145]-201**

[Total No. of Pages : 2

**First Year B.Pharmacy**  
**1.2.1 (T) : PHARMACEUTICS - II**  
**(2013 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Give advantages, disadvantages, types of plastic as pharmaceutical packaging material. Describe evaluation tests for plastic. **[10]**

OR

Discuss centrifugation. Write construction of separators working on the principle of centrifugation.

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

- a) Describe the construction and working of Ball Mill.
- b) Discuss the role of packaging in pharmaceutical products.
- c) What are applications of size separation?
- d) What is filter aid and what are its ideal characteristics?
- e) Draw neat and well labeled diagram of Hammer mill.
- f) What are the types of glass?
- g) Write the pharmaceutical significance of size reduction.

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

- a) Rotary filter.
- b) Standards of sieves.
- c) Blister packing of unit dosage forms.
- d) Factors affecting size reduction.

**P.T.O.**



## SECTION - II

**Q4)** Describe the mixing technologies for oral solutions. Add a note on deaeration. **[10]**

OR

Draw and explain general layout of pharmaceutical manufacturing plant.

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

- a) Write on mixing of powders.
- b) Discuss in brief bioequivalence and generic products.
- c) Describe baffles and their application in mixing operation.
- d) Write on passive absorption.
- e) What is first pass effect?
- f) Write on non renal routes of excretion.
- g) Write on planetary mixer.

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

- a) Packing of oral solution.
- b) Plasma drug concentration - Time profile.
- c) Metabolism.
- d) Good Manufacturing Practices.



Total No. of Questions : 6]

SEAT No. :

**P1972**

**[5145]-202**

[Total No. of Pages : 2

**First Year B.Pharmacy**

**1.2.2.T: DOSAGE FORM DESIGN**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Explain theories of emulsion and formulation aspects of emulsion. **[10]**

OR

Define and explain different types of powders. Explain method of preparation of efferevecent granules.

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

- a) Methods of mixing powders
- b) Explain the importance of densities in evaluating powders
- c) Add a note on emulsifier
- d) Differentiate between flocculated and deflocculated suspension
- e) Write a note on HLB and RHLB
- f) Explain different properties of powders
- g) Write a note on modified release dosage forms

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

- a) Self emulsifying drug delivery
- b) Evaluation tests for suspension
- c) Add a note on angle of repose and its importance in solid dosage forms
- d) Formulation aspects of tooth powder

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

## SECTION -II

**Q4)** Define suppositories; explain formulation and evaluation aspects of suppositories. **[10]**

OR

Explain different methods of enhancement of solubility of drugs.

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

- a) Write a note on Jellies
- b) Differentiate between ointment and creams
- c) Write the applications of radiopharmaceuticals
- d) Define paste and explain types of paste
- e) Ointment bases
- f) Evaluation tests for ointment
- g) Explain the concept of radioactivity

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

- a) Factors affecting rate of dissolution
- b) Mechanism of dissolution
- c) Quality control of radiopharmaceuticals
- d) Formulation aspects of creams



Total No. of Questions : 6]

SEAT No. :

**P1973**

**[5145]-203**

[Total No. of Pages :2

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

**PHARMACEUTICAL ORGANIC CHEMISTRY - II**  
**(2013 Pattern) (Semester - II)**

*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)** Explain why aldehydes are more reactive than Ketones for nucleophilic addition reaction and add a note on Cannizzaro reaction? **[10]**

OR

What are sulphonic acids? Explain any two methods of preparation and two reactions of sulphonic acid. Add a note on aromatic sulfonic acid and acidity of sulphonic acid.

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

- a) Aniline is less basic than methylamine, explain.
- b) Write any three Methods of preparations of Phenol.
- c) What are enamines how are they prepared.
- d) How will you distinguish between primary, secondary and tertiary amine by simple chemical tests.
- e) Draw structures for the following IUPAC names.  
3-chloropentanal, 3-pentanol and 2-methoxy propane.
- f) Explain methods of preparation of ethers.
- g) Explain acidity of phenols.

**P.T.O.**

- Q3)** Write short note on (Any 2): **[10]**
- a) Preparation of amines.
  - b) Oppenaur oxidation.
  - c) Reactions of Alcohols.
  - d) Haloform reactions.

**SECTION - II**

- Q4)** Define Substitution Nucleophilic Bimolecular reaction. Explain mechanism, kinetics and stereochemistry of  $S_N^2$  reactions. **[10]**

OR

What are esters? Discuss Dieckmann reaction and addition of Grignard reagents to esters in detail.

- Q5)** Answer the following (Any 5): **[15]**
- a) Discuss any two reactions of cyanides.
  - b) Comment on hydrolysis of carboxylic acid derivatives
  - c) Explain trans esterification reaction.
  - d) Define amides, how will you convert acids to amides.
  - e) Classify carboxylic acid derivatives with examples. Give any two methods of preparation of amides.
  - f) What are anhydrides? Draw structures of Succinic anhydride and Pthallic anhydride.
  - g) Give any two methods of preparation of alkyl halide.

- Q6)** Write short note on (Any 2): **[10]**
- a) Williamson's Synthesis.
  - b) Hofmann Degradation.
  - c) Cyanides and Isocyanides.
  - d) Preparation and use of carboxylic acids.



Total No. of Questions : 6]

SEAT No. :

**P1974**

**[5145]-204**

[Total No. of Pages :2

**First Year B. Pharmacy**

**1.2.4. HUMAN ANATOMY PHYSIOLOGY - II  
(2013 Pattern) (Semester-II)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION-I**

**Q1)** Draw a neat labeled diagram of respiratory system. Explain mechanism of breathing and exchange of gases at lung and tissue level. **[10]**

OR

Classify nervous system. Write in detail anatomy and functions of brain stem.

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

- a) Draw a neat labeled diagram of cross section of Spinal Cord.
- b) Discuss limbic system in brief.
- c) Explain the structure of lungs.
- d) Describe anatomy of taste buds.
- e) Write a note on interior of eyeball.
- f) Explain thalamic nuclei.
- g) Define the terms tidal volume, inspiratory reserve volume and vital capacity

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

- a) Reflex arc.
- b) Process of neurotransmission.
- c) Thermoregulation.
- d) Physiology of hearing.

**P.T.O.**

**SECTION-II**

**Q4)** Explain in detail physiology of urine formation. **[10]**

OR

Explain synthesis, storage, release and function of thyroid hormones.

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

- a) Draw a neat labelled diagram of internal structure of kidney.
- b) Explain Oogenesis.
- c) Enlist various hormones secreted by anterior pituitary gland with their functions.
- d) Write a note on Anti-Diuretic Hormone.
- e) Write a note on Semen.
- f) Write a note on Histology of a renal corpuscle.
- g) Explain structure of sperm with a neat labelled diagram.

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

- a) Adrenal glands
- b) Physiology of lactation
- c) Nephron
- d) Spermatogenesis



Total No. of Questions :6]

SEAT No. :

[Total No. of Pages :3

**P1975**

**[5145] - 205**

**F.Y.B. Pharmacy**

**125: PHARMACOGNOSY**

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

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

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

**SECTION -I**

**Q1)** Elaborate in detailed types, structure and function of meristematic and permanent tissue. **[10]**

OR

Define applied biology and give important branches of biology also explain relevance of biology to pharmaceutical sciences.

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

- a) Explain RNA translation.
- b) Describe primary and secondary growth of plant cell.
- c) What are unorganized drugs.
- d) Explain morphology of leaf.
- e) Explain secretory plant cells.
- f) Explain Mendelian genetics.
- g) Explain in brief Mitosis process.

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



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

- a) Types and function of stomata and trichomes.
- b) Morphology and microscopy of seed.
- c) Structure and function of protein.
- d) Morphology of Barks.

**SECTION -II**

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

- a) Define Pharmacognosy and explain the scope of Pharmacognosy in detail along with the contribution of various scientists.

OR

- b) Describe in detail significance, site and pathways involved in Photosynthesis.

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

- a) Explain in brief natural method of classification of crude drugs.
- b) Explain in brief food chain and energy flow.
- c) Discuss about dynamics of ecosystem.
- d) Explain in brief need for classification of plants.
- e) What is chemosynthesis?
- f) Explain in brief speciation and extinction.
- g) Explain biodiversity.

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

**[10]**

- a) Components of ecosystem.
- b) Hybridization.
- c) Auxin and Gibberellins.
- d) Pollution and global warming.

*EEE*

Total No. of Questions : 6]

SEAT No. :

**P1976**

**[5145]-206**

[Total No. of Pages : 2

**F. Y. B. Pharmacy**  
**PHARMACEUTICAL ANALYSIS-I**  
**(2013 Pattern) (Semester-II)**

*Time : 3 hours]*

*[Max. Marks: 70*

*Instructions to the candidates:*

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

**SECTION-I**

**Q1)** What are types of errors? Explain ways to minimize it. Add note on accuracy and precision. **[10]**

OR

Explain in detail neutralization curves (with examples) of

- a) Strong acid & Strong base titration.
- b) Strong base & weak acid titration.

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

- a) Define Primary standard. Enlist requirements of primary standards.
- b) Explain the terms significant figures and standard deviation.
- c) Preparation and Standardization of 0.1 M Perchloric acid solution.
- d) What do you mean by Protogenic and protophilic solvent explain with examples.
- e) Define Molarity, Molality and Mole Fraction.
- f) Discuss in brief Ostwald's theory.
- g) Explain the terms Buffer, Buffer index, Buffer capacity.

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

- a) Primary and secondary standards.
- b) Types of Non-aqueous solvents.
- c) Errors in analysis.
- d) Expression of concentration and strength of solution.

**P.T.O.**

**SECTION-II**

**Q4)** What are Argentometric titrations? Give comprehensive account of different Precipitation titrations to detect end point. **[10]**

OR

What is Gravimetric analysis? Discuss in detail unit operations in Gravimetric analysis.

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

- a) How will you Prepare and standradize 0.1 N AgNO<sub>3</sub> solution.
- b) How solubility product and common ion effect affects precipitation.
- c) Discuss types of EDTA titrations.
- d) Differentiate between iodimetric and Iodometric titration.
- e) Explain essay of calcium gluconate as per I.P
- f) How will you prepare and standardize 0.05 M disodium EDTA solution.
- g) Explain digestion in gravimetry.

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

- a) Sodium Nitrate Titration
- b) pM indicators.
- c) Pharmaceutical Applications of Gravimetry.
- d) Titanious Chloride titration.



Total No. of Questions : 6]

SEAT No. :

**P1977**

**[5145]-301**

[Total No. of Pages : 2

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

**2.3.1 T : 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 with suitable example, phase diagram for two component system containing liquid phases, and also write the applications of phase rule. **[10]**

OR

What are aerosols? Explain the principle involved in the two phase system aerosols.

**Q2)** Answer any five

**[15]**

- a) What is ideal gas equation? Explain the Van der Waals Equation for Real Gases.
- b) Explain the deviations to Raoult's law?
- c) Explain the Claude's process for liquefaction of gases.
- d) Draw a neat labeled triple point phase diagram for one component system.
- e) A solution containing 9g of sucrose dissolved in 90g of water has a boiling point of 100.149°C. What is the molecular weight of sucrose if ebullioscopic constant ( $K_b$ ) for water is 0.51?
- f) Write the van't Hoff Equation for Osmotic Pressure.
- g) Explain the Boiling point diagram of an ideal binary mixture.

**P.T.O.**

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

- a) Osmotic Pressure as colligative property.
- b) Specific and equivalent conductance.
- c) Three component system.
- d) Depression of freezing point as colligative property.

**SECTION - II**

**Q4) Attempt any one.**

Explain crystallization and methods of Crystal analysis. [10]

OR

- a) Write a note on Polymorphism. [6]
- b) Discuss BCS classification in detail. [4]

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

- a) Define solubility, Intrinsic solubility and saturation solubility.
- b) Discuss drug and solvent properties affecting Distribution coefficient.
- c) Define glass transition temperature and its significance in pharmacy.
- d) Define and differentiate Entropy and Enthalpy.
- e) State laws of thermodynamics.
- f) Discuss the types of interaction between Solute and solvent.
- g) Explain combined effect of pH and Solvents on solubility.

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

- a) Solubility Parameter.
- b) Nerst distribution law and its Applications.
- c) Factors affecting crystallization and crystal size.
- d) X-Ray Crystallography.

**x x x**

Total No. of Questions : 6]

SEAT No. :

**P1978**

**[5145]-302**

[Total No. of Pages : 2

**S.Y.B.Pharmacy**

**232:PHARMACEUTICAL MICROBIOLOGY AND IMMUNOLOGY  
(2013 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Write in details scope & Application of microbiology to pharmaceuticals.  
Write a note on "Whittaker's Five Kingdom Concept". **[10]**

OR

Explain in details different techniques used for preservation of bacterial culture and write significance of prebiotic and Probiotics.

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

- a) What do you mean by Binary fission?
- b) Write about the contribution of Paul Ehrlich in microbiology.
- c) Differentiate between Endospore and Vegetative bacteria.
- d) Write Morphological characteristics & Importance of *saccharomyces cerevisiae*.
- e) Draw the structure of HIV.
- f) What are the advantage and Disadvantages of Pour plate techniques.
- g) Write the classification of bacteria, depending on arrangement of flagella.

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

- a) Cultivation of Viruses.
- b) Major and Minor Part of Bacteria.
- c) Measurement of Bacterial Growth.
- d) Microbial Limit Test.

**P.T.O.**

## SECTION - II

**Q4)** Define sterilization. Explain different methods of Sterilization with suitable example. **[10]**

OR

Explain in detail specific and nonspecific defense mechanism of host.

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

- a) Define
  - i) Vaccine
  - ii) Sera
  - iii) Antigen
- b) Classify different Immunological product with suitable example.
- c) Differentiate between Active and Passive Immunity.
- d) Write advantages and disadvantages of RW Test?
- e) Why active immunization therapy is not recommend to immunodeficient person?
- f) Write Principle of ELISA test.
- g) Differentiate between CMI and HMI.

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

- a) Antigen-Antibody Reaction.
- b) Chemical classification of Disinfectants.
- c) Classes of Immunoglobulin.
- d) Quality control of Vaccine.

**x      x      x**



Total No. of Questions : 6]

SEAT No. :

**P1979**

**[5145]-303**

[Total No. of Pages : 2

**S.Y. B.Pharmacy**

**233: PHARMACEUTICAL BIOCHEMISTRY**

**(2013 Pattern) (Semester III) (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) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

**Q1)** What is enzyme inhibition? Explain Competitive enzyme inhibition in detail.

Give its significance.

**[10]**

OR

Classify proteins based on biological role and give suitable examples. Comment on secondary structure of proteins.

**Q2)** Attempt short note on any five of the following:

**[15]**

- a) Keratin
- b) t RNA
- c) Lipoproteins
- d) Fatty acids
- e) Cellulose
- f) Globular Proteins
- g) Homopolysaccharides

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

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

- a) DNA replication
- b) Applications of Enzymes
- c) End group analysis in proteins

**SECTION - II**

**Q4)** Explain the steps involved in HMP shunt.

Give the significance of this metabolic pathway. **[10]**

OR

Explain beta oxidation of Fatty acid involving odd no of carbons. Give energetics with suitable example.

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

- a) Ketone bodies
- b) Transamination
- c) Oxidative phosphorylation
- d) Vit D
- e) Biosynthesis of Glycine
- f) Fructose metabolism
- g) Glucogenolysis

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

- a) Cholesterol synthesis
- b) Purine catabolism
- c) Urea cycle and its significance



Total No. of Questions : 6]

SEAT No. :

P1980

[5145]-304

[Total No. of Pages : 3

S.Y. B.Pharmacy

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

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

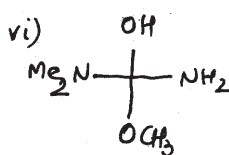
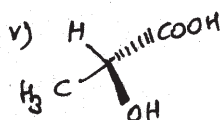
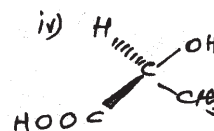
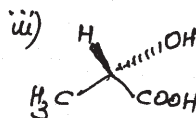
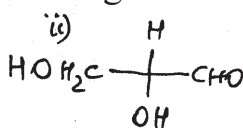
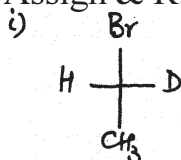
- 1) All questions are compulsory.
- 2) Answers to the two sections to be written in separate answer books.
- 3) Figures in right indicate full marks.
- 4) Neat diagrams to be drawn if necessary.

**SECTION - I**

**Q1)** What do you mean by racemic modification? Explain with suitable examples the various methods used for the racemic modification in details.. [10]

OR

a) Assign & R.& S. configuration for the following [6]



b) What are enantiomers & diastereomers, explain with suitable examples. [4]

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

- a) Write in brief on peptide linkage and its geometry. Classify amino acids.
- b) Explain in brief: Atropisomerism.
- c) Why chair conformation is more stable than boat conformation? Explain.

P.T.O.

- d) Enumerate few advantages of Z/E nomenclature over cis/ trans nomenclature.
- e) Enlist the priority rules for assigning R/S configuration.
- f) Optical isomerism is not exhibited by meso compounds, why?
- g) Discuss the D&L method of nomenclature and its limitations.

**Q3) Short Notes Any Two.**

**[10]**

- a) Syn. & Anti addition.
- b) Conformation of cyclohexane.
- c) Newman & sawhorse projections.
- d) Conformation of Ethane.

### SECTION - II

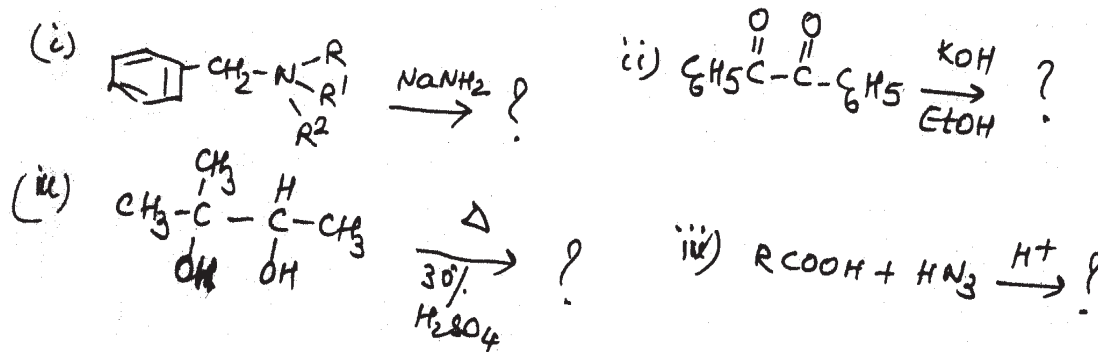
**Q4) Define molecular rearrangement reactions and classify them. Explain in brief any 2 reactions with mechanisms at electron deficient oxygen.**

**[10]**

OR

Produce the product/s

**[10]**



**Q5) Answer Any 5**

**[15]**

- a) Explain electrophilic aromatic substitution in naphthalene.
- b) Discuss Howarth Synthesis of polycyclic aromatic compounds.
- c) How is anthracene prepared from benzene?
- d) Give a short note on wolf rearrangement.
- e) Why does curtives rearrangement lead to urea derivatives as side products.
- f) How shall you prepare 9, 10- dehydrophenanthrene.
- g) Discuss wittig rearrangement.

**Q6) Write short notes (ANY TWO)**

**[10]**

- a) Hoffman Rearrangement.
- b) Claisen Rearrangement.
- c) Lossen Rearrangement.
- d) Stevens rearrangement

ζ ζ ζ

Total No. of Questions : 6]

SEAT No. :

**P1981**

**[5145]-305**

[Total No. of Pages :2

**Second Year B.Pharmacy  
235:PHARMACOLOGY - I  
(2013 Pattern) (Semester - III)**

*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)** Explain various phases of drug metabolism with examples. **[10]**

OR

Enlist various routes of drug administration. Write advantages and disadvantages of oral, sublingual, intravenous, and intramuscular route. **[10]**

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

- a) What are advantages and disadvantages of topical route of drug administration?
- b) Explain enzyme induction and inhibition with example.
- c) Enlist factors affecting drug metabolism.
- d) Define absorption, distribution and elimination.
- e) Enlist and elaborate routes of drug elimination.
- f) What are the factors affecting drug distribution.
- g) Define volume of distribution and half-life of drug? What is their significance?

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

- a) Discuss different transport mechanisms of drugs across plasma membrane.
- b) Write a brief note on nature and sources of drugs.
- c) Explain factors affecting drug bioavailability.
- d) What are the different phases of clinical trials? Explain in detail.

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

## SECTION - II

**Q4)** Explain in detail principles of drug action and write in detail factors modifying drug action. **[10]**

OR

Classify receptor and explain in details with example structure and function of G protein coupled receptor.

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

- a) Define adverse drug reactions with their type.
- b) Explain in detail dose response curve.
- c) Define pharmacodynamics and add a note on therapeutic Index.
- d) Define drug interaction and classify them with example.
- e) Explain in detail drug synergism and drug antagonism phenomenon.
- f) Write in details different type and pathophysiological role of prostaglandins.
- g) Explain in detail structure activity relationship and its effect on drug action.

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

- a) What is drug toxicity and write in detail types of drug toxicity.
- b) Discuss in detail drug treatment in geriatric patients.
- c) Write in details pathophysiological role of histamine and write about antihistaminics.
- d) Discuss transduction mechanism of kinase linked receptor



Total No. of Questions : 6]

SEAT No. :

**P1982**

**[5145]-306**

[Total No. of Pages : 2

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

**236 : PHARMACOGNOSY AND PHYTOCHEMISTRY - 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 answer books.*
- 2) *All questions are compulsory.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

**SECTION - I**

**Q1)** Define carbohydrates? Write in detail occurrence, classification, properties of carbohydrates along with suitable example. **[10]**

OR

What are primary and secondary metabolites? Explain functions of different plant metabolites in plant.

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

- a) Write method of extraction of Pectin.
- b) Add a brief note on Linseed oil.
- c) Write biological source, chemical constituents and uses of shark liver oil.
- d) Add a brief account on Jute.
- e) What is PUFA? Write example and use of PUFA.
- f) Differentiate between fats and Waxes.
- g) Which are different enzyme drugs? Explain general properties and uses.

**Q3)** Answer Any Two questions: **[10]**

- a) Write in detail pharmacognostic account of tragacanth.
- b) Write biological source, chemical constituents and uses of Lecithin.
- c) Explain classification of proteins with suitable examples.
- d) Write a brief note on Inulin.

**P.T.O.**



## SECTION - II

**Q4)** Define and Classify the Glycosides. Explain the method of extraction of Glycosides. **[10]**

OR

Define and classify Tannins. Explain their methods of extraction.

**Q5)** Answer Any Five questions: **[15]**

- a) Differentiate between Cardenolides and Buffadenolides.
- b) Give the biological source, chemical constituents of Gambier.
- c) Explain the Borntragers and Modified Borntragers test.
- d) Write biological source, chemical constituents and uses of liquorice.
- e) Chemical tests for Tannins.
- f) Give the chemical tests for Guar Gum.
- g) Give the biological source, chemical constituents of Rhubarb.

**Q6)** Answer Any Two questions: **[10]**

- a) Give the method of preparation of Black Catechu.
- b) Give the method of preparation of Shark liver oil.
- c) Add an account on Digitalis.
- d) Explain in detail different varieties of Aloe.

x      x      x

Total No. of Questions : 6]

SEAT No. :

**P1983**

**[5145]-401**

[Total No. of Pages : 2

**S.Y. B.Pharmacy**

**PHYSICAL PHARMACEUTICS - II**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Define 'Thixotropy'. Explain the methods used for determination of thixotropy, add a note on its application in pharmacy. **[10]**

OR

Describe various methods to measure surface tension. Write a note on interfacial tension and how it can be measured. **[10]**

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

- a) Explain sieve analysis method for particle size measurement along with its limitations.
- b) Give principle behind Ostwald viscometer.
- c) How is the half life for first order reactions calculated?
- d) Define the following concept: Colloids - Lyophilic sol and Lyophobic sol.
- e) What is viscoelasticity?
- f) Explain briefly the methods for measurement of surface area of particles.
- g) Describe the applications of colloids in pharmacy.

**P.T.O.**

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

- a) Electrical double layer.
- b) Falling ball viscometer.
- c) Half life and shelf life.
- d) Schulze - Hardy rule.

**SECTION - II**

**Q4)** Explain the different methods used for determination of 'order of reaction'. [10]

OR

What do you understand by derived and fundamental properties of particle? [10]

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

- a) Describe the different types of particle diameters.
- b) One point determination is virtually useless in characterizing flow properties of non newtonian liquids. Explain.
- c) Justify: first order reaction is independent on initial concentration of reactant.
- d) Describe gold number.
- e) Describe application of rheology in suspension.
- f) Discuss Nernst and Zeta potential.
- g) Explain non-newtonian liquids.

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

- a) Hydrophilic and hydrophobic colloids.
- b) Flow of powders.
- c) Krafft and cloud point.
- d) Bulges and spurs.



Total No. of Questions :6]

SEAT No. :

[Total No. of Pages :3

**P1984**

**[5145] - 402**

**S.Y.B. Pharmacy**

**PATHOPHYSIOLOGY & CLINICAL BIOCHEMISTRY**

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

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

**SECTION -I**

**Q1)** Discuss and classify Heart failure. Explain the pathophysiology of heart failure. **[10]**

OR

Describe in detail pathophysiology and management of chronic obstructive airway disease. **[10]**

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

- a) Discuss the etiology of ulcer.
- b) Define and enlist the types of cardiac shock.
- c) Define ulcer, leukemia and pancreatitis.
- d) Write the complication of Anemia.
- e) Write the pathophysiology of coronary artery disease.
- f) Define and classify hepatitis.
- g) Explain the clinical manifestations of Cirrhosis.

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

**Q3)** Write a note on the following (Any Two):

**[10]**

- a) Cell injury.
- b) Burger disease.
- c) Leukemia.
- d) Low blood pressure.

**SECTION -II**

**Q4)** Discuss in detail diabetes mellitus.

**[10]**

OR

Discuss etiology and treatment of Malaria in detail.

**Q5)** Solve any five of the following:

**[15]**

- a) Write pathophysiology of Tuberculosis.
- b) Explain in brief renal calculi.
- c) Explain in brief about pain.
- d) Write clinical manifestations of Parkinson's disease.
- e) Explain gout in brief.
- f) Define the terms;
  - i) Nephritis.
  - ii) Leprosy.
  - iii) Anxiety.
- g) Define and classify epilepsy.

**Q6)** Write a note on following (any two):

**[10]**

- a) Malignancy.
- b) Acute Urinary tract Infections.
- c) Schizophrenia.
- d) Osteoarthritis.

*EEE*

Total No. of Questions : 6]

SEAT No. :

**P1985**

**[5145]- 403**

[Total No. of Pages : 2

**S.Y.B.Pharmacy**

**243 : PHARMACEUTICAL ORGANIC CHEMISTRY - IV  
(2013 Pattern) (Semester - IV)**

*Time :3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1) a)** Give a detail account of guidelines and rules in retrosynthesis. **[10]**

OR

b) Give methods of synthesis and reactions of Pyridine. **[10]**

**Q2) Answer in short (Any Five) **[15]****

- a) Nucleophilic substitution reactions of quinoline
- b) Give reason: Furan shows electrophilic substitution at 2 or 5 position.
- c) Give following reactions of furan:
  - i) Diels-Alder reaction
  - ii) Gomberg reaction
- d) Give properties of imidazole.
- e) Draw the following heterocycles with numbering and example of one drug each:
  - i) Cinnoline
  - ii) Benzthiazole
  - iii) Oxazole
- f) Draw the resonance structure of:
  - i) Imidazole
  - ii) Pyridine
- g) Give any two reactions of pyrrole.

***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)** Write in detail structural establishment of Glucose. [10]

OR

What is combinatorial synthesis? Add a note on multiple parallel synthesis in Combinatorial chemistry. Explain Tea Bag method of synthesis. [10]

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

- a) Explain combinatorial chemistry in drug discovery.
- b) How will you distinguish between glucose and fructose?
- c) Explain mutarotation of glucose.
- d) Explain any two reactions of any hexose.
- e) Explain use of Microwave in Pharmaceutical Organic chemistry.
- f) Write short notes on Solid supported synthesis of peptides.
- g) Explain lengthening and shortening the chain of aldoses with respective examples.

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

- a) Deconvolution method in combinatorial chemistry.
- b) Nanochemistry
- c) Killiani - Fischer synthesis.
- d) Solid supported synthesis of peptides.





Total No. of Questions : 6]

SEAT No. :

**P1986**

**[5145]-404**

[Total No. of Pages :2

**Second Year B. Pharmacy**

**244 : PHARMACEUTICAL ANALYSIS - II**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION-I**

**Q1)** Explain in detail different types of conductometric titration curves. Write advantages of conductometric end point detection. **[10]**

OR

Discuss in detail types of polarographic techniques. Write applications of polarography. **[10]**

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

- a) Explain in brief principle of amperometry.
- b) Explain effect of dilution on specific, molecular and equivalent conductance.
- c) Discuss measurement of electrode potential.
- d) Write about biamperometric titrations.
- e) Classify different electrodes used in potentiometry.
- f) Write role of supporting electrolyte and maxima suppressors in polarography.
- g) What is half wave potential? Explain different parts of polarogram.

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

- a) Ion selective electrodes
- b) Conductivity meter
- c) Dropping mercury electrode
- d) High frequency titrations

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

## SECTION-II

**Q4)** Answer the following

- a) Determination of water by Karl Fisher method [5]
- b) Spectropolarimeter [5]

OR

Write principle of coulometric analysis. Discuss in detail about constant current coulometric analysis. [10]

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

- a) Discuss about Optical activity
- b) Explain about determination of Refractive index
- c) Explain the terms Specific and Molar refraction
- d) Explain the different types of plane polarize light
- e) Add a note on Abbe's refractometer
- f) Give an account on Cotton effect
- g) Discuss about application of refractometry

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

- a) Oxygen combustion flask technique
- b) Determination of nitrogen by Kjeldahl's method
- c) ORD and CD curve
- d) Silver coulometer



Total No. of Questions : 6]

SEAT No. :

**P1987**

**[5145]-405**

[Total No. of Pages : 2

**Second Year B.Pharm.**

**PHARMACOGNOSY AND PHYTOCHEMISTRY - II**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Define Alkaloids, protoalkaloids and pseudoalkaloids. Explain pharmacognosy of a Quinoline alkaloid. **[10]**

OR

Classify Alkaloids on the basis of its chemical nature. Discuss pharmacognostic account of narcotic Isoquinoline Alkaloid. **[10]**

**Q2)** Answer any five of the following: **[5 × 3 = 15]**

- a) Write biosynthesis for Tropane Alkaloid.
- b) Discuss adultrants of Rauwolfia.
- c) Write chemical tests for identification of Alkaloids.
- d) Describe chemical constituents of Claviceps perpuria.
- e) Draw labelled diagram of T.S. of Priwinkle leaf.
- f) Describe chemical properties of Alkaloids.
- g) Discuss chemical constituents and uses of Holarrhena.

**P.T.O.**

**Q3) Solve Any Two of the following:** **[2 × 5 = 10]**

- a) Note on artificial method of cultivation of Ergot.
- b) Explain microscopy and uses of stem containing Amino alkaloid.
- c) Write extraction, isolation and identification test for purin alkaloids.
- d) Explain method of extraction and isolation for Strychnin and Brucin.

**SECTION - II**

**Q4) Define and classify Terpenoids. Write in detail methods of extraction of volatile oils.** **[10]**

OR

Describe the detail pharmacoonostic account of Commiphora. **[10]**

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

- a) Compare between Podophyllum root and rhizome.
- b) Describe chemical constituents and uses of Ginger.
- c) Describe method of cultivation and collection of Kalmi Dalchini.
- d) Draw T.S. of Clove bud.
- e) Explain uses of Artimissia.
- f) Give importance of Optical activity.
- g) Note on Clavenger apparatus.

**Q6) Discuss on Any Two of the following:** **[2 × 5 = 10]**

- a) Sandalwood.
- b) Taxol.
- c) Boswellia.
- d) Analysis of volatile oils.



Total No. of Questions : 6]

SEAT No. :

**P1988**

**[5145]-406**

[Total No. of Pages : 2

**S.Y. B.Pharmacy**  
**PHARMACEUTICAL ENGINEERING**  
**(2013 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Explain theory & mechanism of drying. Give working of spray dryer in detail. **[10]**

OR

Write a note on different types of heat exchangers and explain process of heat transfer in boiling liquids.

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

- a) Explain factors affecting evaporation process.
- b) Give Stefan-Boltzmann law of heat transfer.
- c) Give working of Horizontal Effect Evaporator.
- d) Explain factors affecting drying.
- e) Explain construction & working of flash dryer.
- f) Classify heat exchangers & draw a labelled diagram of shell & tube heat exchangers.
- g) Give application of freeze dryer.

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

- a) Fourier's law & steady state heat transfer.
- b) Fluidized bed dryer.
- c) Falling film evaporator.
- d) Two film theory of mass transfer.

**P.T.O.**

## SECTION - II

**Q4)** Explain Bernoulli's theorem, with its application and limitations. **[10]**

OR

Explain various types of corrosion. Explain any two methods to combat corrosion.

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

- a) Explain Reynold's number.
- b) What is boiling point diagram?
- c) Explain plate efficiency.
- d) What is caking of crystals? How it is prevented?
- e) Explain working of Rotameter.
- f) Explain diffusion theory of crystal growth.
- g) Add a note on fractionating columns used in distillation process.

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

- a) Theory of supersaturation with its limitations.
- b) Molecular distillation.
- c) Types of packing in packed columns.
- d) Swenson-Walker crystallizer.



Total No. of Questions : 6]

SEAT No. :

**P1989**

**[5145]-501**

[Total No. of Pages : 2

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

**INDUSTRIAL PHARMACY - I  
(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answer 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 in detail IPQC tests for tablet. **[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 pH at GIT with respect to absorption.
- c) Give detail account on mechanism of granulation.
- d) Write a note on co-processed excipients.
- e) Discuss chilsonator roller compaction process.
- f) Discuss Extrusion and Spheronization.
- g) Discuss types of tablet.

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

- a) Discuss defects in tablet. Give its remedies.
- b) Discuss biopharmaceutical consideration for dosage form design.
- c) Discuss force volume relationship in table manufacturing.
- d) Give detail account on evaluation of granules.

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

## SECTION - II

**Q4)** Discuss in details the process of Manufacturing of Hard Gelatin Capsule. **[10]**

OR

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

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

- a) Discuss Shell Hardness ratio and their uses.
- b) Write about Glatt immersion sword system?
- c) Discuss various enteric coating materials?
- d) Discuss in detail Film coating Defects.
- e) Discuss Electrostatic coating process?
- f) What do you mean by Rotoweight and Rotosort.
- g) Discuss weight variation test of capsules as per USP.

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

- a) Discuss in details variables involved in sugar coating.
- b) Add note on Fluidized Bed Coating.
- c) Write a note on Accela-coata and Dria coater.
- d) IPQC test for Capsules as per I.P.

x      x      x



Total No. of Questions : 6]

SEAT No. :

**P1990**

**[5145]-502**

[Total No. of Pages : 2

**T.Y.B.Pharmacy**

**3.5.2 : PHARMACEUTICAL ANALYSIS - III  
(2013 Pattern) (Semester - V) (Theory)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** State Beer - Lamberts law and derive equation for it. Discuss in detail the limitations to Beer's law. **[10]**

OR

Draw a neat diagram of double beam UV-Visible Spectrophotometer. Describe various radiation sources and detectors used in UV-Visible spectroscopy.

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

- a) Explain the term chromophore, auxochrome and bathochromic shift.
- b) Classify instrumental methods of analysis.
- c) Explain principle involved in flame photometry.
- d) Write a note on sampling plan.
- e) Discuss different types of electronic transitions involved in UV-Spectroscopy.
- f) Write a note on separating analytes from interferents.
- g) Draw a neat diagram of burner used in flame photometry and explain its functioning.

**P.T.O.**

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

- a) Derivative spectrophotometry.
- b) Applications of flame photometry.
- c) Liquid-liquid extraction.
- d) Monochromators used in UV-Spectrophotometry.

**SECTION - II**

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

OR

Discuss different deactivation process involved in photoluminescence phenomenon.

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

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

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

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

**x x x**

Total No. of Questions : 6]

SEAT No. :

**P1991**

**[5145]-503**

[Total No. of Pages : 2

**Third Year B.Pharmacy**  
**353: MEDICINAL CHEMISTRY-I**  
**(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** What are antihypertensive agents? Discuss with one example from each class, SAR and MOA of antihypertensive agents. **[10]**

OR

Define receptor. Enlist the different types of receptor. Explain in detail about various forces involved in drug-receptor interactions. **[10]**

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

- a) Write a short note on beta blockers.
- b) Discuss SAR and MOA of potassium sparing diuretics.
- c) Give synthesis of methyldopa.
- d) Add a note on Ferguson principle.
- e) Write a note on receptor site theories.
- f) Explain in detail biosynthesis, storage and release of acetylcholine.
- g) What is protein binding? Write significance of protein binding.

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

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

- a) Stereochemical factors affecting drug actions.
- b) Signal transduction mechanism.
- c) Cholinergic receptor.
- d) Cardiotonics.

**SECTION - II**

**Q4) Explain in detail SAR and MOA of sympathomimetic drugs. [10]**

OR

Write MOA of anti-anginal agents and classify it with one example from each class. [10]

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

- a) Write synthesis of prazosin.
- b) Add a short note on anticoagulants.
- c) Discuss SAR of acetylcholine.
- d) Highlight of neuro-muscular blocking agents.
- e) Comment on adrenergic receptors along with their locations.
- f) Explain and classify ganglionic blocking agents.
- g) Give focus on bioisosterism.

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

- a) Biosynthesis, storage and metabolism of catecholamines.
- b) Alpha blockers.
- c) Osmotic and loop diuretics.
- d) Conjugation reaction.



Total No. of Questions : 6]

SEAT No. :

**P1992**

**[5145]-504**

[Total No. of Pages : 3

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Define Parasympathomimetic drugs. Classify cholinergic drugs with suitable example. Explain biosynthesis, storage, release and metabolism of acetylcholine (Ach). Enlists various cholinergic receptor. **[10]**

OR

Define Anti-adrenergic agents. Classify adrenoceptor blocking drugs with suitable example. Explain pharmacological effect of alpha ( $\alpha$ ) blockers and give therapeutic uses of  $\alpha$ -(alpha) blocker. **[10]**

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

- a) Define the following term.
  - i) Glaucoma
  - ii) Mydriasis
  - iii) Pheochromocytoma
- b) Enlist the difference between parasympathetic and sympathetic nervous system.
- c) Classify anticholinesterase agents with suitable example.
- d) Explain neurohumoral transmission at nerve terminal.

**P.T.O.**

- e) Classify anticholinergic drugs with suitable example.
- f) Explain biosynthesis of Adrenaline.
- g) Give therapeutic uses of atropine.

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

- a) Ganglion blocker.
- b) Organophosphate poisoning and its treatment.
- c) Pharmacotherapy of myasthenia gravis.
- d) Neuromuscular blockers.

### **SECTION - II**

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

OR

Describe biosynthesis, storage, and release of Insulin. Add a note on Insulin preparation. [10]

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

- a) Explain mode of action of thyroid hormones.
- b) What are tocolytics? Explain in brief.
- c) Explain calcium homeostasis.
- d) Explain role of gonadotropins in male.
- e) Describe physiological effect of glucagon.
- f) Write the action of prolactin.
- g) Explain mechanism of action of Insulin.

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

**[10]**

- a) Hormones of Adenohypophysis.
- b) Antithyroid Drugs.
- c) Androgens.
- d) Progestins.



Total No. of Questions : 6]

SEAT No. :

**P1993**

**[5145]-505**

[Total No. of Pages : 2

**T.Y. B.Pharmacy**

**355 : ANALYTICAL PHARMACOGNOSY AND EXTRACTION  
TECHNOLOGY**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate answer-books.*
- 3) *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 Microwave-assisted extraction.
- b) Explain the Principle and applications of HPLC.

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

- a) Give the chemical tests for Curcumin and atropine.
- b) Explain the isolation procedure of Piperine.
- c) Enlist different types of adsorbents for column chromatography.
- d) Explain merits and demerits of Soxhlet extraction.
- e) Describe the procedure for "Foreign matter" as per WHO guidelines.
- f) Explain Ultrasound-assisted extraction with an example.
- g) Enlist the types of difficulties in analysis of natural products.

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

- a) Explain the maceration and percolation process.
- b) Explain the applications of HPTLC in herbal drug analysis.
- c) Explain the procedure & significance of 'Tannin Content' as per WHO guidelines.
- d) Define Adulteration and explain its types with suitable examples.

**P.T.O.**



## SECTION - II

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

- a) Describe in detail:
  - i) Method of determining bitterness value in crude drugs.
  - ii) Different types of Ash value with their significance.
- b) Explain role of 'Storage Area and Central Store' in maintaining quality in pharmaceutical products as per WHO guideline.

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

- a) Enlist the contents of labels for all reagents of a pharmaceutical QC laboratory.
- b) Explain the extraction of peppermint oil by steam distillation method.
- c) Explain merits & demerits of Supercritical fluid extraction.
- d) Describe method for isolation of rose oil.
- e) Describe the procedure of sampling.
- f) Explain determination of aflatoxins as per WHO.
- g) Explain source, properties and test of digoxin.

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

- a) Explain Source, properties, isolation & tests of Sennosoids.
- b) Explain the procedure for determination of haemolytic activity as per WHO guidelines.
- c) Explain Froth-floatation technique.
- d) Explain advantages of TLC over paper chromatography.

ζ ζ ζ

Total No. of Questions : 6]

SEAT No. :

**P1994**

**[5145]-506**

[Total No. of Pages : 2

**T.Y. B.Pharmacy**

**PHARMACEUTICAL BUSINESS MANAGEMENT & DISASTER  
MANAGEMENT**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Figures to right to indicate marks assigned.*
- 2) *Write each section in separate answer books.*
- 3) *All questions are compulsory.*

**SECTION - I**

**Q1)** Give different principle & various flowcharts of organizing. **[10]**

OR

Define Planning. Explain its purpose describe steps in planning in detail.

**Q2)** Answer any FIVE (Each three marks). **[15]**

- a) Network Analysis.
- b) Define objective. Give importance of objective.
- c) Write short note on budgetary control.
- d) What are concepts & purpose of controlling.
- e) Explain the responsibilities of manager.
- f) Line & Staff organization.
- g) Break Even Analysis.

**Q3)** Answer Any TWO (Each FIVE Marks). **[10]**

- a) Budgetary & non budgetary control.
- b) Function & responsibility of Manager.
- c) Peter Drucker contribution in modern management.
- d) Decision making process.

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

**SECTION - II**

**Q4)** Define communication. Explain the process of communication and different forms of communication. **[10]**

OR

What is meant by “Marketing Research”. Explain its purpose & write in detail steps involved in Marketing Research.

**Q5)** Answer Any Five of the following (each carries three marks) **[15]**

- a) Explain different techniques used in performance appraisal.
- b) What is the difference between Advertising and sales promotion.
- c) Explain Maslow’s theory of motivation.
- d) Define leadership. Explain different styles of leadership.
- e) Explain in brief the functions performed by wholesalers.
- f) What are the objectives of Advertising.
- g) Explain Disaster Management cycle.

**Q6)** Answer Any Two of the following (each carries five marks) **[10]**

- a) Managerial grid.
- b) Factors affecting determination price.
- c) Medical representative: Role & Qualities.
- d) Techniques of Performance Appraisal.



Total No. of Questions : 6]

SEAT No. :

**P1995**

**[5145]-507**

[Total No. of Pages : 2

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

**ACTIVE PHARMACEUTICAL INGREDIENTS TECHNOLOGY  
(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** What is esterification? What are different types of esterification? Describe manufacturing process of any one API by esterification process. **[10]**

OR

What is nitration? Discuss various nitrating agents. Describe manufacture of any one API by nitration process. **[10]**

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

- a) Define Active Pharmaceutical Ingredient, Bulk drug and Fine Chemical with example of each.
- b) Define and give significance of Dehydrating Value of Sulphuric acid (D.V.S).
- c) Enlist and describe reducing agents used in amination by reduction.
- d) Enlist alkylating agents with examples.
- e) Enlist various methods of resolution of racemates of APIs, describe one in detail.
- f) What is ICH? What is significance of various ICH guidelines for API manufacturing?
- g) What is polymorphism? Give its significance in API.

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

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

- a) Outline the following with reference to the Q7 guideline of API manufacturing:
  - i) Process Equipment
  - ii) Quality Management
- b) Asymmetric synthesis of Active Pharmaceutical Ingredients.
- c) Methods of preparation of Polymorphs.
- d) CMC document and its significance.

### **SECTION - II**

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

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

OR

Discuss the process variable in API manufacturing and their effect on product quality and yield. **[10]**

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

- a) Discuss with suitable Flow chart the manufacturing process of Atenolol.
- b) Enlist the characteristics of ideal reagent for preparation of API.
- c) Enlist tools for purification and product isolation. Discuss any one in brief.
- d) Explain types of health hazard in API manufacturing.
- e) Discuss physical characteristics of solvents for scale-up.
- f) Write down the basic differences between expedient route and optimal/cost effective route.
- g) What is work-up in API manufacturing?

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

- a) Manufacturing procedures and scale-up techniques for Ranitidine.
- b) Strategies for route selection in API manufacturing.
- c) Design of environment friendly processes.
- d) IPCs in API manufacturing.



Total No. of Questions : 6]

SEAT No. :

**P1996**

**[5145]-601**

[Total No. of Pages : 2

**Third Year B.Pharmacy**

**3.6.1 (T): INDUSTRIAL PHARMACY - II  
(2013 Pattern) (Semester - VI)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Discuss stability of suspension with the help of DLVO theory. Describe evaluation of suspensions. **[10]**

OR

Explain various stability issues of emulsion and describe in detail reasons and preventive measures to avoid instability.

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

- a) Describe in detail role of particle size, density and viscosity in development of stable suspension.
- b) Write in brief electrostatic and stearic stabilization of emulsion.
- c) Enlist and explain IPQC test for antacid suspension.
- d) Differentiate between flocculated and deflocculated suspension.
- e) Explain in detail suspensions for reconstitution.
- f) Enlist and explain any equipment used in manufacturing of emulsion.
- g) Explain in brief cloud point.

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

- a) Stoke's law of sedimentation
- b) Multiple emulsion
- c) Flocculating agents
- d) Identification test for type of emulsion

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

## SECTION - II

**Q4)** Explain percutaneous absorption of drug. Give probable mechanisms for increase in penetration of drug through the skin. **[10]**

OR

Classify types of semisolids with examples. Explain in detail formulation aspect of any two types in detail.

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

- a) Define flux and explain procedure for measurement of flux.
- b) Enlist and explain any two safety evaluation parameters for dermatological semisolids.
- c) Explain quality control parameters for eye ointment.
- d) Explain role of colloid mill in the manufacturing of semisolids.
- e) Describe layout for manufacturing of semisolid department as per GMP.
- f) Discuss in brief gelling agents.
- g) Describe various equipments used in large scale manufacturing of disperse system.

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

- a) Hydrocarbon bases
- b) Skin irritation test
- c) Additives used in semisolid
- d) Spreadability test.



Total No. of Questions : 6]

SEAT No. :

**P1997**

**[5145]-602**

[Total No. of Pages : 2

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

*Time : 3 hours]*

*[Max. Marks: 70*

*Instructions to the candidates:*

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

**SECTION-I**

**Q1)** Classify chromatographic techniques. Explain rate and plate theory. [10]  
Discuss column packing techniques.

OR

Write advantages and limitations of HPTLC technique. Discuss various detection systems used in HPTLC.

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

- a) Discuss any three adsorbent used in TLC.
- b) Define any three chromatographic performance parameters.
- c) Classify planar chromatography with suitable examples.
- d) Discuss applications of column chromatography.
- e) How to increase the efficiency of column?
- f) Write the methods for TLC plate preparation.
- g) Discuss applications of TLC.

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

- a) Paper chromatography.
- b) Principle and instrumentation of electrophoresis.
- c) 2D TLC
- d) Instrumentation and applications of DSC.

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



**SECTION-II**

**Q4)** Explain assay method validation as per ICH guidelines. **[10]**

OR

What are the techniques of measurement of radioactivity.

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

- a) What is meant by Operational Qualification?
- b) What are methods for calculation of Limit of Quantitation?
- c) Explain construction and working of X-ray tube.
- d) Write principle of Thermogravimetry.
- e) Write any three applications of DTA.
- f) Discuss factors affecting TGA results.
- g) State the principle of DTA.

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

- a) Analytical method specificity
- b) X-ray diffraction applications
- c) Crucibles in TGA
- d) Isothermal Titration Calorimetry



Total No. of Questions : 6]

SEAT No. :

**P1998**

**[5145]-603**

[Total No. of Pages :2

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** What are anti hyperglycemic agents? Describe SAR, mode of action of sulfonyl ureas. Outline synthesis of any one of them. **[10]**

OR

Discuss SAR, mode of action & uses of barbiturates & Draw synthesis of Thiopental sodium. **[10]**

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

- a) Classify local anesthetics with one structure of drug from each class.
- b) Write a note on Hydantoin derivatives in treatment of epilepsy.
- c) Draw synthesis of diazepam.
- d) Explain different types of reduction reactions in drug metabolism.
- e) Describe any two drugs used as respiratory stimulants.
- f) Write structure MOA & use of metformin.
- g) Classify general anesthetics? Add a short note on ketamine.

**P.T.O.**

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

- a) Classify sedative hypnotic drugs & add a note on benzodiazepines.
- b) Write a note on non barbiturates sedatives & hypnotics.
- c) Explain importance of metabolism study in new drug discovery.
- d) write a note on general structural features of anticonvulsant drugs.

**SECTION - II**

**Q4) Discuss SAR of Phenothiazines with liberal use of examples and structures. [10]**

OR

Write SAR, mode of action and therapeutic uses of benzodiazepines. [10]

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

- a) Discuss chemistry of succinimides.
- b) “Carbidopa is prescribed with Levodopa”. Justify the statement.
- c) Write structures of any two Butyrophenones.
- d) Discuss metabolism of Metformin.
- e) Write synthesis of Fluoxetine.
- f) Write synthesis of Haloperidol.
- g) Justify use of MAO-B inhibitors over MAO-A inhibitors in Parkinson’s treatment.

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

- a) Write short note on anti migraine agents.
- b) Justify the use of anticholinergic agents to treat Alzheimer’s disease. And classify Alzheimer’s agents with structure of one drug from each class.
- c) Discuss phase I and phase II metabolic reactions giving suitable examples.
- d) Classify, Write structures and Explain the agents used for organ function tests.



Total No. of Questions : 6]

SEAT No. :

**P1999**

**[5145]-604**

[Total No. of Pages :2

**Third Year B. Pharmacy**  
**3.6.4 PHARMACOLOGY - III**  
**(2013 Pattern) (Semester-VI)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION-I**

**Q1)** Classify benzodiazepines. Discuss mechanism of action, pharmacological actions, therapeutic uses, and adverse drug reactions of diazepam. **[10]**

OR

Classify antiepileptic. Write mechanism of action, pharmacological action, adverse effects and therapeutic uses of Hydantoins.

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

- a) Classify antipsychotic drugs with example of each class.
- b) Write adverse effects of tricyclic antidepressants.
- c) Write the stages of general anesthesia.
- d) Pharmacotherapy of Parkinson's disease.
- e) Write a note on atypical anxiolytics.
- f) Write a short note on selective serotonin reuptake inhibitors.
- g) Write an account on inhalation anesthetics.

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

- a) Local Anesthetics
- b) Antimanic drugs
- c) Pharmacotherapy of Alzheimer's disease
- d) Management of Alcoholism

**P.T.O.**

## SECTION-II

**Q4)** Write Pharmacotherapy of Peptic Ulcer and pharmacology of proton pump inhibitors. **[10]**

OR

Classify NSAIDS and write pharmacological details of Paracetamol

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

- a) Write a short note opoid antagonists
- b) Write Pharmacotherapy of Constipation
- c) Write MOA and adverse effects of Omerazole
- d) Explain pharmacotherapy of gout
- e) Write a note on morphine poisoning
- f) Write a short note opoid analgesics
- g) Classify antitussives

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

- a) Classify drugs used in bronchial asthma and add a note in  $\beta$ -agonists
- b) Write Pharmacotherapy of diarrhea
- c) Explain pharmacotherapy of Osteoarthritis
- d) MOA, ADR and Uses of Aspirin, Omeprezole Naloxone



Total No. of Questions : 6]

SEAT No. :

**P2000**

**[5145]-605**

[Total No. of Pages : 2

**T. Y. B. Pharmacy**  
**NATURAL PRODUCT CHEMISTRY**  
**(2013 Pattern) (Semester - VI)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION -I**

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

- a) Enlist different chromatographic techniques used in characterization of natural products. Describe HPTLC method of characterization.
- b) Explain Characterization & structure elucidation of alkaloids by chemical methods.

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

- a) Write a note on optical rotation and Refractive index.
- b) Explain what is rate of reaction.
- c) Write a note on IR spectroscopy.
- d) What is ozonolysis? Explain its role in stereochemistry.
- e) Give the applications of NMR.
- f) Write a short note on chemical derivatization.
- g) Write a note on elucidation of biosynthetic pathways by isolated organ tissues and grafts.

**P.T.O.**

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

- a) Tracer techniques and its applications.
- b) Principle and applications of HPLC/ GC (anyone).
- c) Explain different spectroscopical methods involved in location of functional groups in natural products.
- d) Write a detailed note on structural elucidation of flavonoids.

**SECTION -II**

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

- a) Write a detailed note on Marine drugs. Add a note on cardiovascular marine drugs.
- b) Elaborate the role of natural products in new drug discovery.

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

- a) What is the difference between nutritive and non-nutritive sweeteners?
- b) Enlist any six API from natural products.
- c) Write a note on Beet and Indigo dyes.
- d) Explain in detail the use of Monellin.
- e) Give classification of natural colorants.
- f) Write B.S, C.C, & uses of annato.
- g) What do you mean by taste perception?

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

- a) Classify marine cytotoxic agents and give examples.
- b) Enlist various strategies of drug discovery. Explain any two.
- c) Explain in detail the use of Serendipity berry as a sweetener.
- d) Write a note on Gymnema.

⊗ ⊗ ⊗

Total No. of Questions : 6]

SEAT No. :

**P2001**

**[5145]-606**

[Total No. of Pages : 2

**Third Year B.Pharmacy**  
**BIOORGANIC CHEMISTRY & DRUG DESIGN**  
**(2013 Pattern) (Semester - VI)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** How are enzymes classified? Give suitable examples of each class. Explain in detail physiological role of Monoamine oxidase enzyme with differentiation between its subtypes. **[10]**

OR

Explain biosynthesis of prostaglandins by cyclooxygenase. Differentiate between COX 1 and 2 enzymes and comment on their inhibitors.

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

- a) Write a note on Tyrosine Kinase inhibitors.
- b) Explain rate limiting step in Cholesterol synthesis.
- c) How molecules are recognized at target site? Explain.
- d) Explain mechanism of action of Methotrexate.
- e) Write a note on Molecular adaptation and explain the term 'Proximity effect'.
- f) Explain how intercalation contributes in binding of drug with DNA/RNA.
- g) Write a note on topoisomerase - II enzyme.

**P.T.O.**



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

- a) Write a note on antisense therapy.
- b) Write a note on physiological role of Carbonic Anhydrase and their inhibitors.
- c) Write a note on adrenergic receptors and explain their types.
- d) Write a note on dopamine receptors and their agonists and antagonists.

### **SECTION - II**

**Q4)** Explain Drug Discovery process. Give detail account of different methods of Drug Discovery. [10]

OR

Explain the concept, types and application of QSAR technique in drug design.

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

- a) Explain how lead optimization contributes in drug design.
- b) Explain History of QSAR.
- c) Explain the concept of prodrug design with suitable example.
- d) Write a note on software used in Molecular Docking.
- e) Explain Molecular Dynamics.
- f) Write a note on descriptors used in QSAR model.
- g) Explain Free Wilson method in QSAR.

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

- a) Define Pharmacophore. Explain workflow of pharmacophore model construction.
- b) Give five applications of prodrug design.
- c) Explain Structure-based drug design.
- d) Explain types of enzyme inhibition in rational drug design.



Total No. of Questions : 6]

SEAT No. :

**P2002**

**[5145]- 607**

[Total No. of Pages : 3

**Third Year B.Pharmacy**  
**367:PHARMACEUTICAL BIOTECHNOLOGY**  
**(2013 Pattern) (Semester - VI)**

*Time :3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Explain steps involved in recombinant DNA technology.

Add a note on - Production of rDNA constructs and uses for Somatotropin.  
**[10]**

OR

What do you understand by Gene Cloning?

What are various types of cloning vectors involved in the process?

Describe the role of expression vectors in recombinant DNA technology with suitable examples.

**Q2)** Answer ANY FIVE of the following.

**[15]**

- a) Define the following-
  - i) Biotechnology
  - ii) Recombinant DNA and
  - iii) Enzyme Immobilization.
- b) Enlist applications of biotechnology to Pharmaceutical Industry.

**P.T.O.**

- c) Write significance of enzymes acting on DNA
  - i) Polymerase
  - ii) SI nuclease
  - iii) Ligase
- d) How will you transfer gene by transduction method?
- e) Give principle and applications involved in gel electrophoresis
- f) What is melting temperature? Write its significance in DNA hybridization.
- g) Explain the steps involved in isolation of DNA.

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

- a) Gene synthesis
- b) Features of a vector required to facilitate cloning
- c) Site directed mutagenesis
- d) Gene sequencing

### **SECTION - II**

**Q4)** Give details of strain improvement, media, different stages of fermentation and product recovery in production of any one vitamin of your interest. **[10]**

OR

What is hybridoma technology?

Explain the steps involved in the production of monoclonal antibodies and applications.

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

- a) What is enzyme immobilization? Enumerate use of immobilized enzymes in medicine with suitable examples
- b) Give methods for creating transgenic animals and explain any one of them with suitable examples.
- c) Enlist various criteria to be considered in designing of a fermentor.  
Draw a neat schematic labeled diagram of fermentor.

- d) What are palindromic nucleotide sequences? Give its significance.
- e) Explain in brief-Steps involved in Cryopreservation.
- f) Write a brief account on production of insulin by rDNA technology.
- g) How to control foam during fermentation?

**Q6)** Write short notes on ANY TWO of the following:

**[10]**

- a) Antibiotic production by fermentation
- b) Down stream processing
- c) Interferon production by rDNA technology
- d) cDNA library



Total No. of Questions : 6]

SEAT No. :

**P2003**

**[5145]-701**

[Total No. of Pages : 2

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

**STERILE PRODUCTS**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Explain the role of tonicity modifiers and preservatives in the formulation of sterile parenteral products. **[10]**

OR

Explain in details the large scale manufacture of sterile aqueous suspensions.

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

- a) Give principle of working of HEPA and laminar flow.
- b) What are the challenges in development of parenteral formulations containing proteins and peptides.
- c) Write note on various solvents used in formulation of SVPs (small volume parenterals).
- d) Explain working of membrane filters.
- e) Classify SVPs (small volume parenterals) with examples.
- f) Write note on prefilled syringes.
- g) Write note on various routes of parenteral administration with examples of formulations administered by that route.

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

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

- a) Give importance of solubility analysis as preformulation parameter for development of sterile parenteral formulation.
- b) Explain the principle and process of FFS technology.
- c) Enlist all the quality control tests for SVPs (small volume parenterals) with special note on pyrogen testing. (Bacterial endotoxin test) as per I.P.
- d) Write note on sterile reconstituted products.

**SECTION - II**

**Q4)** Explain in detail different steps involved in freeze drying process. **[10]**

OR

Write an elaborate account of stability aspects of LVPs. Explain the quality control tests for LVPs.

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

- a) Write the ideal properties of plasma volume expanders.
- b) Write different types of primary wound dressing.
- c) Write types of dosage forms for ophthalmic use.
- d) Explain in short quality control of blood products.
- e) Explain in short evaluation tests for ophthalmic products.
- f) Write quality control tests of catgut.
- g) Write the classification of surgical Bandages.

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

- a) Principle of lyophilization and role of cryoprotectants.
- b) Parenteral nutrition.
- c) Contact lens.
- d) Formulation of LVPs.

**x      x      x**

Total No. of Questions : 6]

SEAT No. :

**P2004**

**[5145]-702**

[Total No. of Pages : 2

**F.Y.B.Pharmacy**

**472 : PHARMACEUTICAL ANALYSIS - V  
(2013 Pattern) (Semester - VII)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Explain principle of IR spectroscopy and factors affecting vibrational frequencies. **[10]**

OR

Describe principle, instrumentation and applications of SEM technique.

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

- a) Compare Raman and IR techniques.
- b) What are the advantages of NIR techniques?
- c) Compare SEM and TEM techniques.
- d) Explain principle of TEM.
- e) Explain group frequency IR region.
- f) Explain types of molecular vibrations and energy associated with it.
- g) Explain mechanism of Rayleigh scattering.

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

- a) Write about interactions in SEM.
- b) Discuss non dispersive IR instrument.
- c) Describe applications of Raman techniques.
- d) Provide comparative of Near, MID and FAR IR regions.

**P.T.O.**

## SECTION - II

**Q4)** Describe the different detectors used in Gas Chromatography with suitable diagram. Give their characteristics, merits and demerits. **[10]**

OR

Discuss the instrumentation, working and applications of Super Critical Fluid Chromatography.

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

- a) Why GLC is more sensitive method than HPLC?
- b) Discuss the applications of Atomic Emission Spectroscopy.
- c) Explain derivatization in GC.
- d) Give Applications of Flash Chromatography.
- e) Write principle of Super Critical Fluid Chromatography.
- f) Explain WCOT.
- g) Write the theory of Atomic Emission Spectroscopy.

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

- a) Van Deemter equation and its application.
- b) Instrumentation and working of Flash Chromatography.
- c) Compare Flash and Super Critical Fluid Chromatography.
- d) Instrumentation of Atomic Emission Spectroscopy.

**x      x      x**



Total No. of Questions : 6]

SEAT No. :

**P2005**

**[5145]-703**

[Total No. of Pages : 2

**Final Year B.Pharmacy  
MEDICINAL CHEMISTRY-III  
(2013 Pattern) (Semester - VII)**

*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) Solve any 1 Question: [10]**

Classify antihistamines and discuss H<sub>2</sub> receptor antagonists in details giving their structures & sketch out synthetic route for chlorpheniramine.

OR

Discuss SAR, MOA & chemistry of morphine and write synthesis of Methadone or Propoxyphen.

**Q2) Solve any 5 (Each Question carries 3 marks) [15]**

- a) Write SAR of pethidine.
- b) Discuss Proton pump inhibitors.
- c) Explain Prostaglandin analogs.
- d) Write a short note on H<sub>1</sub> agonists.
- e) Write a short note on NSAIDS.
- f) Write few drug actions mediated by Eicosanoids.
- g) Write synthesis of any 1: Promethazine or Prolidine.

**Q3) Solve any 2 questions (Each carries 5 marks) [10]**

- a) Discuss Endogenous opioid peptides & their SAR.
- b) Write synthesis of Ibuprofen and Paracetamol.
- c) Explain importance of tautomerism of Histamine.
- d) Write short note on opioid antagonists.

**P.T.O.**

## SECTION - II

**Q4)** What is expectorant? Classify drugs used in respiratory tract. Give an account on MOA and therapeutic uses of Expectorants. **[10]**

OR

What is Ulcer? Give classification of drugs used in ulcer. Add a note on Proton pump inhibitor.

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

- a) Give an account on drug used for constipation.
- b) Classify expectorants and antitussives.
- c) Draw synthesis of omeprazole.
- d) Explain antisecretory agents.
- e) Give an account of opioid antidiarrheal drug.
- f) Draw synthesis of Guaifensin.
- g) Explain drugs used in cough.

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

- a) Antiemetics
- b) Antispasmodic
- c) Antiasthmatics
- d) Antidiarrheal



Total No. of Questions : 6]

SEAT No. :

**P2006**

**[5145]-704**

[Total No. of Pages : 2

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Classify antineoplastic agents. Explain in detail mode of action, pharmacological actions, therapeutic uses and adverse effects of antimetabolites. **[10]**

OR

Classify drugs used in treatment of HIV. Explain in detail mode of action, pharmacological actions, therapeutic uses and adverse effects of one drug from each class.

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

- a) Explain mode of action and adverse effects of Chloramphenicol.
- b) Classify antileprotic drugs with example.
- c) Explain mode of action of Tetracyclines.
- d) Write the mechanism of action and adverse effects of isoniazide.
- e) Explain rationale behind combination of Penicillins with Clavulonic acid.
- f) Explain mode of action and adverse effects of Metronidazole.
- g) Classify antimalarials with examples.

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

**Q3) Write Short Notes On Any Two. [10]**

- a) Sulfonamides.
- b) Mechanism and role of drug resistance in chemotherapy.
- c) Immunomodulators.
- d) Anthelmintics.

**SECTION - II**

**Q4) Classify diuretics with examples. Explain in detail mode of action, pharmacological actions, therapeutic uses and adverse effects of loop diuretics. [10]**

OR

Classify antihypertensive agents. Explain the role of ACE inhibitors in management of hypertension.

**Q5) Answer (ANY FIVE) [15]**

- a) Discuss role of nitrates in angina pectoris.
- b) Explain scope of safety pharmacology.
- c) Explain mode of action of Heparin.
- d) Discuss role of Clofibrate in atherosclerosis.
- e) Explain mode of action and adverse effects of Acetazolamide.
- f) Classify drugs used for Congestive Heart Failure.
- g) Write a note on fibrinolytic agents.

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

- a) Antioxidants and their therapeutic uses.
- b) Management of arrhythmia.
- c) Haemopoietics.
- d) Role of  $\beta$ -blockers in cardiac disorders.

ζ ζ ζ

Total No. of Questions : 6]

SEAT No. :

**P2007**

**[5145]-705**

[Total No. of Pages : 2

**Final Year B.Pharmacy**  
**4.7.5 NATURAL DRUG TECHNOLOGY**  
**(2013 Pattern) (Semester - VII) (Theory)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1) Solve any ONE:**

**[10]**

- a) What do you mean by Arista and Bhasma? Give methods of preparation and evaluation of Arista and Bhasma.
- b) Discuss standardization of herbal drugs with special emphasis on current approaches, difficulties and limitations in standardization.

**Q2) Solve Any FIVE:**

**[15]**

- a) Give significance of authentication of plant material.
- b) Give factors influencing the level of plant metabolites.
- c) Write a note on WHO guidelines to good storage practices for pharmaceuticals.
- d) Discuss the methods to control infestation.
- e) Write a note on Vatika.
- f) Discuss the deterioration of crud drugs due to
  - i) Moisture
  - ii) Temperature
- g) Write a short note on Churna.

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

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

- a) Discuss WHO guidelines on Good Agricultural and Collection Practices (GACP)
- b) Explain in brief diagnosis and treatment in Ayurveda.
- c) Give principle and applications of DNA fingerprinting in plants.
- d) Write a note on Siddha system of medicine.

### **SECTION - II**

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

- a) What do you mean by oral bioavailability enhancers? Discuss in details the natural products as oral bioavailability enhancers.
- b) Classify herbal dietary supplements. Discuss in detail Garlic, Spirulina and Turmeric as herbal dietary supplement.

**Q5) Solve Any FIVE:** **[15]**

- a) Give the Pharmacognostic account of Pyrethrum.
- b) Give general method of preparation of herbal shampoo.
- c) Write a note on evaluation of skin cosmetics.
- d) Write a note on Hyaluronic acid in wound management.
- e) Explain probiotics and prebiotics with examples.
- f) Comment on pesticides and environment.
- g) Write a note on Ginko biloba.

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

- a) Discuss in detail novel drug delivery system for herbal drugs.
- b) What are pest? Describe in detail different methods of pest control.
- c) Discuss in detail the herbs used in skin and hair care cosmetics.
- d) Write a note on biofuels.



Total No. of Questions : 6]

SEAT No. :

**P2008**

**[5145]-706**

[Total No. of Pages : 2

**Final 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)** List various factors affecting absorption. Explain patient related factors in detail. **[10]**

OR

Describe nature of Blood-Brain barrier and discuss properties of drug required to cross blood brain barrier.

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

- a) Influence of polymorphs on absorption.
- b) Effect of particle size of drug on absorption.
- c) Ideal properties of dissolution test apparatus.
- d) Effect of different salts on absorption of drug.
- e) Phase I reactions involved in biotransformation of drug molecule.
- f) Causes of non-linear pharmacokinetics.
- g) Absorption of drug after intramuscular administration.

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

- a) Apparent volume of distribution.
- b) Biopharmaceutics classification system.
- c) Factors affecting renal clearance.
- d) Influence of drug pKa and GI pH on drug absorption.

**P.T.O.**

## SECTION - II

**Q4)** Define Bioavailability and Bioequivalence and explain study parameters 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) How bioavailability determined on the basis of plasma data.
- b) Discuss factors affecting bioavailability of drugs.
- c) What is significance of compartmental analysis.
- d) What is non compartmental analysis.
- e) Explain plasma concentration time profile.
- f) What is Two compartmental analysis.
- g) What are the advantages of urinary data over plasma data.

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

- a) Wagner Nelson Method.
- b) Single verses Multiple doses study.
- c) Absolute and Relative Bioavailability.
- d) Biowaivers.

**x      x      x**



Total No. of Questions : 6]

SEAT No. :

**P2009**

**[5145]-707**

[Total No. of Pages : 2

**Final Year B.Pharmacy**

**4.7.7 : PHARMACEUTICAL JURISPRUDENCE**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Enlist different administrative bodies under Drugs and Cosmetics Act 1940. Discuss the qualifications, powers and duties of Drug Inspector. **[10]**

OR

Write in detail objectives and salient features of Drugs and Magic Remedies Act 1954 and Rules 1955. **[10]**

**Q2)** Attempt any five (3 marks each): **[15]**

- a) What are the qualifications for entry of name in First Register as per the provisions of Pharmacy Act, 1948?
- b) What does the Schedule J and Schedule H under D & C act 1940 prescribe?
- c) Enumerate the main recommendations of Drug Enquiry Committee.
- d) Write the provisions for the import of drugs for examination test or analysis.
- e) Write in brief about Education Regulation.
- f) What are the functions of Animal Welfare board of India.
- g) What are the objectives of Central Consumer Protection Council established under Consumer Protection Act, 1986?

**P.T.O.**

**Q3) Attempt any two (5 marks each):** **[10]**

- a) Define “Illicit traffic”. Discuss in detail control on certain operations by Central Government under Narcotic Drugs And Psychotropic Substances Act 1985.
- b) Discuss the constitution, and functions of Central Drug Laboratory.
- c) Define “Ceiling Price” under Drug Price Control Order 2013. Explain the general formula for calculation of ceiling price of a scheduled formulation.
- d) Write a short note on registration of Pharmacist.

**SECTION - II**

**Q4) What is IPR? Write its significance and elaborate different forms of IPR.** **[10]**

OR

What is Patent? Discuss latest amendments in patent act 1970. **[10]**

**Q5) Attempt any five (3 marks each):** **[15]**

- a) What are product and process patents?
- b) Write the significance of Hatch Waxman Act.
- c) What is patent infringement?
- d) What is “therapeutic good” as per the provisions of TGA.
- e) Enlist different Standard Institutions and regulatory authorities.
- f) Write in brief about Orange Book.
- g) What are the documents required for patent filing?

**Q6) Attempt any two (5 marks each):** **[10]**

- a) What is Bioequivalence? Explain the contents of ANDA.
- b) What are EMR and Compulsory Licensing?
- c) Write a short note on opposition to grant of patent.
- d) Write a short note on USFDA.



Total No. of Questions :6]

SEAT No. :

[Total No. of Pages :2

**P2010**

**[5145] - 801**

**Fourth Year B. Pharmacy**

**4.8.1: ADVANCED DRUG DELIVERY SYSTEM**

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

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

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

**SECTION -I**

**Q1)** Differentiate between controlled release and sustain release drug delivery system, Prerequisites of drug candidates, explain dissolution based controlled drug delivery system. **[10]**

OR

Explain formulation development and evaluation of transdermal 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 probiotics write applications of probiotics.
- c) Write on formulation method of liposomes.
- d) Write on dose calculation for controlled drug delivery system.
- e) Write on parenteral implants.
- f) Write about osmotic pump.
- g) Factors affecting sonophoretic drug delivery system.

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

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

- a) IUDs
- b) Penetration enhancers.
- c) Liposomes.
- d) Iontophoresis.

**SECTION -II**

**Q4) What is mean by microencapsulation? Explain how chemical encapsulation occurs by coacervation method.** **[10]**

OR

Explain Aerosols Component and factors affecting its selection.

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

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

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

- a) Describe polymer - polymer incompatibility method of Microencapsulation.
- b) Quality Control tesst of Aerosols.
- c) How to evaluate Microencapsulation.
- d) Describe valve assembly of Aerosols.

*EEE*

Total No. of Questions : 6]

SEAT No. :

**P2011**

**[5145]- 802**

[Total No. of Pages : 2

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

*Time :3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1) a)** Write in detail about the various additives used in cosmetics. **[10]**

OR

b) Discuss in detail about formulation development, manufacturing and evaluation of Lipsticks.

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

- a) Discuss formulation aspects of vanishing cream.
- b) Differentiate between cosmetics and drug formulation.
- c) Discuss about the formulation of shaving creams.
- d) Define cosmetics. Classify skin cosmetics.
- e) What are antiperspirants? Write about liquid antiperspirants.
- f) Describe in brief about bath oils.
- g) Discuss about powder rouges.

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

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

- a) Sunscreen preparations
- b) Face powders
- c) Cleansing creams
- d) Microbial control in cosmetic manufacturing.

**SECTION - II**

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

OR

What are eye makeup preparations? Explain in detail about eye mascara and eye shadow.

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

- a) Discuss the formulation aspect of tooth powder.
- b) Explain hair dyes as cosmetic products.
- c) What are depilatories? Write about ingredients used in depilatories.
- d) Discuss in brief about evaluation tests for manicure preparations.
- e) Differentiate between cosmetics and cosmeceuticals.
- f) Write about baby powders.
- g) Discuss about nail lacquer remover.

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

- a) Mouth washes
- b) Antioxidants as cosmeceuticals
- c) Nail lacquer
- d) Hair tonics.



Total No. of Questions : 6]

SEAT No. :

**P2012**

**[5145]-803**

[Total No. of Pages :2

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION-I**

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

Discuss the principle of  $^1\text{H-NMR}$ . Compare  $^{13}\text{C-NMR}$  vs  $^1\text{H-NMR}$ .

OR

Discuss principle, instrumentation and application of Capillary electrophoresis.

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

- a) Pascal triangle for signal splitting in proton NMR.
- b) Give exceptions to  $n+1$  splitting rule with suitable examples.
- c) What is Nuclear Overhauser Effect (NOE)?
- d) Give Principle of Electron Spin Resonance.
- e) Differentiate between Acetone, Acetaldehyde and Ethyl methyl ether by  $^1\text{HNMR}$ .
- f) What is Chemical shift in proton NMR?
- g) How will you correlate spin quantum numbers with total no.of spin state?

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

- a) Spin-Spin Coupling (Splitting)
- b) Double resonance Technique
- c) Principle and Applications of Ion exchange chromatography
- d) Relaxation mechanisms in proton NMR.

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

## SECTION-II

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

What are the properties required for ideal detector in HPLC. Explain the principle and use of RI, ELSD and UV detector.

OR

Discuss the developments in ionization techniques. Give principle and working of ESI and MALDI techniques in mass spectrometry.

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

- a) Area normalization technique for quantification in column chromatography
- b) Molecular ion
- c) TOF mass analyzer
- d) Peak tailing and peak asymmetry factor
- e) Differentiate HPLC and UPLC on basis of particle size, column dimensions and flow rate.
- f) McLafferty Rearrangement
- g) Degassing techniques in HPLC.

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

- a) LC-MS
- b) Electron impact ionization in mass spectrometry.
- c) Discuss Receptating pump in HPLC.
- d) Field free regions in mass spectrometry and formation of metastable ion.





Total No. of Questions : 6]

SEAT No. :

**P2013**

**[5145]-804**

[Total No. of Pages : 2

**Final Year B.Pharm.**

**4.8.4 : MEDICINAL CHEMISTRY - IV  
(2013 Pattern) (Semester - VIII)**

*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)** What are Antimycobacterial agents? Discuss chemistry SAR, MOA and adverse effects of first line Antitubercular agents. **[10]**

OR

Classify antimalarials. Discuss SAR of 4-aminoquinolines, 8-aminoquinolines and 2, 4-diaminopyrimidines. **[10]**

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

- a) Give the scheme of synthesis of Proguanil.
- b) Explain giving examples, minimum structural requirements of sulphonamides to show antibacterial activity.
- c) Explain chemistry and mode of action of amantadine.
- d) Give the scheme of synthesis of Clotrimazole.
- e) Classify antiamoebic agents and explain of any one class.
- f) Discuss Chemistry, SAR, MOA of fluoroquinolone antibacterial agents, giving examples.
- g) Give the scheme of synthesis of Saquinavir.

**P.T.O.**

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

- a) Reverse transcriptase inhibitors.
- b) Alkylating agents.
- c) Anthelmintic agents.
- d) Antiviral agents acting on influenza.

**SECTION - II**

**Q4) Classify  $\beta$ -lactam antibiotics on the basis of chemical nature. Discuss the development, mechanism of action and structure activity relationship of Penicillins with examples.** **[10]**

OR

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

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

- a) Give the scheme of synthesis of Chlorambucil.
- b) Add a note on Androgens.
- c) What is GnRH antagonist?
- d) Give the scheme of synthesis of PAS.
- e) Explain selective estrogen receptor modulators.
- f) Comment on combination Oral Contraceptives.
- g) Give the scheme of synthesis of Amoxicillin Trihydrate.

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

- a) Thyroid hormones and Antithyroid agents.
- b) Lincomycin Antibiotics.
- c) Monobactams and beta lactamase inhibitors.
- d) SAR and MOA of Chloramphenicol.



Total No. of Questions : 6]

SEAT No. :

**P2014**

**[5145]-805**

[Total No. of Pages : 2

**Final Year B.Pharmacy**  
**PHARMACOLOGY - V (Including Biostatistics)**  
**(2013 Pattern) (Semester - VIII)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** Define and classify drug interaction. Explain in brief pharmacodynamic drug interaction with suitable examples. **[10]**

OR

Define Adverse drug reactions (ADR). Discuss in brief monitoring and reporting of ADR.

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

- a) Explain the types of hypersensitivity reactions.
- b) Write about disease targets for gene therapy.
- c) Justify why levodopa and carbidopa are beneficial drug interaction.
- d) Principles of rehabilitation of drug addicts.
- e) Write the sources and types of stem cells.
- f) Explain drug interaction during drug distribution with example.
- g) Write the need for Pharmacovigilance.

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

- a) Drug - food interaction.
- b) Therapeutic drug monitoring (TDM).
- c) Liver function test.
- d) Teratogenicity.

**P.T.O.**

## SECTION - II

**Q4)** Define Institutional Review Board (IRB). Explain in brief its objectives, composition, responsibilities and process. **[10]**

OR

Explain various drug distribution systems in the hospital pharmacy with its advantages and disadvantages.

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

- a) Discuss the qualification and responsibilities of investigator in clinical trials.
- b) Define Protocol, Blinded Study, Randomization.
- c) Write the minimum standards required for hospital pharmacy.
- d) Discuss the special consideration in informed consent.
- e) Define patient counselling. Explain different stages of patient counselling.
- f) Write the advantages and disadvantages of inpatient and outpatient pharmacy.
- g) Write the importance of Nuremberg Code.

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

- a) Role of hospital pharmacist in hospital committees.
- b) Phases of clinical trials.
- c) Declaration of Helsinki.
- d) Principles of ICH GCP Guidelines.



Total No. of Questions :6]

SEAT No. :

[Total No. of Pages :2

**P2015**

**[5145] - 806**

**Fourth Year B. Pharmacy**

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

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

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

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

**SECTION -I**

**Q1) Solve any One:**

**[10]**

Add an exhaustive note on the Global market size with respect to sale of Herbal natural products.

OR

Add an exhaustive note on the Global market size with respect to sale of Nutraceuticals.

**Q2) Solve any Five:**

**[15]**

- a) Write the significance of biofuels in national economy.
- b) Give the significance of pharmacovigilance.
- c) Add a note on herbal cosmetic products.
- d) Give the procedure for registration of traditional medicinal products in India.
- e) Add a brief note on potential spices exported from India.
- f) List the documents need to be submitted for company registration.
- g) Explain the advantages of using herbal medicines.

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

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

- a) Comment on major herbs and herbal extracts exported from India.
- b) Explain the meaning, need, and significance of pharmacovigilance of Herbal medicines.
- c) Note on Traditional Medicinal Products and Domestic market.
- d) Add a note on Leading Manufacturers of Herbal drugs in India.

**SECTION -II**

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

Comment on Quality Assurance of herbal medicinal products.

OR

Give the general procedure for drug export registration to various countries and give the objective of regulation of herbal medicine along with its classification.

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

- a) What is ICH and who are the members of ICH.
- b) Write a toxicity and drug interaction of –Liquorice.
- c) Define allergy and give examples of plants causing allergenic reactions.
- d) Give the structure of ICH steering committee and its sub groups.
- e) Explain different category of herbal medicines.
- f) Define herbal drug interaction and give the possible causes for the herb drug interaction.
- g) What is CITES and give its objectives.

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

- a) Explain the challenges encountered in regulation of Herbal medicines.
- b) Add a brief note on concepts on Quality by Design (QbD).
- c) Give the methods of preparation of allergenic extracts.
- d) Note on adverse drug reaction (ADR) report.

*EEE*

Total No. of Questions : 6]

SEAT No. :

**P2016**

**[5145]- 807**

[Total No. of Pages : 2

**Final Year B.Pharmacy**

**487: QUALITY ASSURANCE TECHNIQUES  
(2013 Pattern) (Semester - VIII)**

*Time :3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** What is quality control? Discuss the major components of quality control.[10]

OR

Discuss in detail validation master plan (VMP).

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

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

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

- a) Types and stages of validation.
- b) Quality Audits.
- c) URS.
- d) Cleaning validation of equipment.

**P.T.O.**

## SECTION - II

**Q4)** Discuss general requirements regarding equipment's in pharmaceutical manufacturing unit. **[10]**

OR

Explain Quality management system.

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

- a) Write the contents and importance of equipment log.
- b) Write the SOP for personal hygiene in pharmaceutical manufacturing plant.
- c) Enlist the requirement of qualification and experience of personnel in cGMP.
- d) Explain design, size and location for equipment.
- e) Explain plumbing and drainage system in manufacturing plant.
- f) State importance of staff training.
- g) Explain storage conditions in stability testing of new drug.

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

- a) Harmonization of GMP
- b) Batch production and control records
- c) Site master file
- d) Functions of QA department in Pharmaceutical organization

