

Total No. of Questions : 3]

SEAT No. :

**P883**

[Total No. of Pages : 2

**[5854]-101**

**First Year B. Pharmacy**

**HUMAN ANATOMY AND PHYSIOLOGY - I**

**(2018 Pattern) (Semester - I) (BP101T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Attempt all the following questions.

**[10×2=20]**

- a) Write about types of epithelial tissue.
- b) Explain in brief Cell junctions.
- c) Write in brief Semilunar valves.
- d) Enlist the various types of human bones.
- e) Explain in brief lymph circulation.
- f) What is heart sound?
- g) What are the various body fluids?
- h) Enlist and define tongue disorders.
- i) Discuss in brief anatomy of human nose.
- j) Write the importance of blood transfusion.

**Q2)** Attempt any **TWO** questions from the following.

**[2×10=20]**

- a) Explain in detail process of blood formation.
- b) Discuss in detail structures and functions of skin.
- c) Explain the neuromuscular junction in detail.

**P.T.O.**

**Q3)** Attempt any **SEVEN** question from the following.

**[7×5=35]**

- a) What is blood pressure? Discuss the factors affecting blood pressure.
- b) Explain in brief reticuloendothelial system.
- c) Explain the hemolytic disease of newborn.
- d) Describe Coronary Circulation.
- e) Explain in brief homeostasis.
- f) Explain the muscle tone in detail.
- g) Explain Spinal nerves.
- h) Explain the ear as a sense organ.
- i) Differentiate between Mitosis and Meiosis.



Total No. of Questions : 3]

SEAT No. :

**P884**

[Total No. of Pages : 2

**[5854]-102**

**First Year B. Pharmacy**

**BP102 T : PHARMACEUTICAL ANALYSIS - I**

**(2018 Pattern) (Semester - I) (BP 102T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer the following (10×2)/objective types questions. **[10×2=20]**

- a) Give the name of different techniques of pharmaceutical analysis.
- b) Define specific conductivity.
- c) What is Nernst equation?
- d) Define diffusion current.
- e) How will you prepare and standardise 0.1N Potassium Permanganate solution.
- f) What is colloidal state? Enumerate the properties of colloidal particles.
- g) What do you mean by Co precipitation? Enlist the types of Co precipitation.
- h) Enlist the different types of Redox titration on the basis oxidant or reductant used
- i) Define the term Ligand and Chelation
- j) Define Ohm's law

**Q2)** Answer the following (Answer 2 out of 3) **[2×10=20]**

- a) Explain in detail about the various types of Complexometry titration.
- b) Discuss the various types of titration curves obtained in acid-base titration.
- c) Give detail about Conductometric titrations, its principle and instrumentation.

**P.T.O.**

**Q3)** Answer the following (Answer 7 out of 9)

**[7×5=35]**

- a) Explain in detail different source of impurities.
- b) Explain in detail various commonly used method of expressing concentration.
- c) Write a note on indicator electrode.
- d) Explain factors affecting Ilkovic equation.
- e) Explain different methods of minimising errors.
- f) Explain Mohr's method.
- g) Give detail application of Polarography.
- h) Explain universal and mixed indicators
- i) Write note on Dropping Mercury Electrode.



Total No. of Questions : 3]

SEAT No. :

P885

[Total No. of Pages : 4

[5854]-103

**F.Y. B. Pharmacy**  
**PHARMACEUTICS - I**

**(2018 Pattern) (Semester - I) (BP 103T) (Theory)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Multiple Choice Questions (MCQ) select the proper choice : [20 × 1 = 20]

- a) The first Indian Pharmacopoeia was published in:
  - i) 1955
  - ii) 1855
  - iii) 1890
  - iv) 1904
- b) Solutions having freezing point \_\_\_\_\_ is isotonic with tear secretion.
  - i) 0.52°C
  - ii) 0.52°F
  - iii) 5.2°C
  - iv) -0.52°C
- c) Macrogel is a \_\_\_\_\_ type of ointment base.
  - i) Absorption
  - ii) Oily
  - iii) Oleaginous
  - iv) Water soluble base
- d) The Single dose mixtures are called as \_\_\_\_\_.
  - i) Solution
  - ii) Draught
  - iii) Drop
  - iv) Cachet

**P.T.O.**

- e) The subscription indicates:\_\_\_\_\_
- i) Directions to the patient      ii) Directions to the pharmacist
  - iii) Directions to the physician      iv) None of these.
- f) In case of infants, the most important criteria for dose of drug is \_\_\_\_\_
- i) Age and body weight
  - ii) Body weight and Body surface area
  - iii) Sex and Body weight
  - iv) Both (i) and (ii)
- g) The solutions having same osmotic pressure as that of blood plasma is known as \_\_\_\_\_
- i) Para tonic      ii) Isotonic
  - iii) Hypotonic      iv) Hypertonic
- h) The enclosed powders made up of rice paper are called as \_\_\_\_\_
- i) Tablets triturates      ii) Cachets
  - iii) Compound Powders      iv) Simple Powders
- i) \_\_\_\_\_ is the most widely used solvent as a vehicle for pharmaceutical product.
- i) Alcohol      ii) Water
  - iii) Oil      iv) None of these.
- j) The monophasic liquids can be given for \_\_\_\_\_
- i) Bitter and irritant drugs      ii) Saline and Nauseous drugs
  - iii) Both (i) and (ii)      iv) None of these.
- k) The colloidal suspensions have particle size:\_\_\_\_\_
- i) Less than 1  $\mu\text{m}$       ii) More than 1  $\mu\text{m}$  to 50-75  $\mu\text{m}$
  - iii) Between 1nm to 0.5  $\mu\text{m}$       iv) Between 1  $\mu\text{m}$  to 5 $\mu\text{m}$

- l) The wetting agents used in the suspensions act by \_\_\_\_
- i) Reducing interfacial tension
  - ii) Displaces entrant air
  - iii) Forms a film around Dispersed particles
  - iv) All of the above
- m) Emulsions are \_\_\_\_.
- i) Homogenous, Stable
  - ii) Homogenous, Unstable
  - iii) Heterogeneous, Stable
  - iv) Heterogeneous, Unstable
- n) The suppositories made for Vaginal cavity are called as \_\_\_\_
- i) Suppositories
  - ii) Pessaries
  - iii) Ear bougies
  - iv) Nasal cones.
- o) When two immiscible liquids are added together, the in compatibility is called as \_\_\_\_.
- i) Physical
  - ii) Chemical
  - iii) Therapeutic
  - iv) Pharmacokinetic
- p) Dose is a \_\_\_\_ quantity.
- i) Related
  - ii) Changed
  - iii) Fixed
  - iv) Average
- q) The hydrocarbon bases are \_\_\_\_
- i) Not absorbed by skin and forms occlusive layer
  - ii) It restricts the loss of moisture
  - iii) Both (i) and (ii)
  - iv) Not inert.

- r) The drugs are rapidly absorbed from ..(a)
- i) empty stomach
  - ii) full stomach
  - iii) empty mouth
  - iv) none of these
- s) Liquefaction is an example of \_\_\_\_\_ incompatibility.
- i) Chemical
  - ii) Physical
  - iii) Biopharmaceutical
  - iv) None of these
- t) The concentration of NaCl which is isotonic with blood plasma is :
- i) 0.9% w/v
  - ii) 1.0% w/v
  - iii) 0.09% w/v
  - iv) 0.3% w/v

**Q2) Answer any TWO :** **[2 × 10 = 20]**

- a) Define the prescription. Explain in details various steps involved in handling of prescription.
- b) Explain various methods of preparation of suspension in details.
- c) Explain various evaluation tests for semisolid dosage forms in details.

**Q3) Solve any SEVEN :** **[7 × 5 = 35]**

- a) Define suppository and give the importance of displacement value in preparation with example.
- b) If the adult dose of a drug is 100 mg, what will be the dose of a child with body surface area of 0.5 m<sup>2</sup>?
- c) Differentiate between flocculated and deflocculated suspensions with suitable points.
- d) Write a note on Pastes.
- e) Explain chemical incompatibilities.
- f) In what proportions 20% w/w benzocaine ointment should be mixed with an ointment base to produce 2.5 % w/w benzocaine ointment?





Total No. of Questions : 3]

SEAT No. :

**P886**

[Total No. of Pages : 2

**[5854]-104**

**First Year B. Pharmacy**

**PHARMACEUTICAL INORGANIC CHEMISTRY**

**(2018 Pattern) (Semester - I) (BP104 T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer all the following

**[10×2=20]**

- a) Define limit test. Mention various limit tests used.
- b) What are acids, bases according to Lowry-Bronsted theory? Give suitable examples.
- c) Give method of preparation and use of Sodium chloride.
- d) Give role of fluoride in the treatment of dental caries. Give name of fluoride containing anticaries agent.
- e) Why combinations of antacids are used? Give various antacid combinations.
- f) What are adsorbents? Give examples.
- g) Define astringents with examples.
- h) Write in short about Haematinics.
- i) Enlist methods of adjusting isotonicity.
- j) What are expectorants?

**P.T.O.**

**Q2)** Attempt any two out of Three.

**[2×10=20]**

- a) Describe types and sources of impurities in pharmaceutical substances.
- b) Give mechanism for antimicrobial agents. Add a note on Hydrogen peroxide and Potassium Permanganate as an antimicrobial agent.
- c) Explain Storage conditions, precautions and pharmaceutical applications of radioactive substances.

**Q3)** Attempt any Seven out of nine.

**[7×5=35]**

- a) Give the preparation, identification tests, assay and medicinal uses of Sodium Bicarbonate.
- b) Write history and development of Indian Pharmacopoeia.
- c) What is buffer capacity and Buffer equation?
- d) Write in detail about ORS.
- e) Write a note on Cathartics.
- f) What is mean by Radioactivity? Give methods for measurement of Radioactivity.
- g) What are desensitizing agents? Write a note on zinc-eugenol cement.
- h) Give modified limit test for chloride and sulphate.
- i) Write a note on poison and Antidote.



Total No. of Questions : 3]

SEAT No. :

P887

[Total No. of Pages : 2

[5854]-201

First Year B. Pharmacy

HUMAN ANATOMY AND PHYSIOLOGY - II

(2018 Credit Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

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

Q1) Answer the following :

[20]

- a) Enlist organs of digestive system.
- b) Explain composition and functions of gastric juice.
- c) Explain layers of stomach from outside to inside.
- d) Describe the disorders :
  - i) Alzheimer's disease
  - ii) Schizophrenia.
- e) Explain types of neuroglia cells.
- f) Draw neat labelled diagram of nephron.
- g) Define cushing's syndrome and pheochromocytoma.
- h) Mention different methods of artificial respiration.
- i) Enlist different lung volumes and capacities with normal values.
- j) Discuss the functions of prostate glands.

P.T.O.

**Q2) Answer the following (Any 2)**

**[20]**

- a) Describe basic functions of nervous system. Give organisation of nervous system. Discuss diencephalon in detail.
- b) Explain biosynthesis, storage and release of thyroid glands.
- c) Discuss the structure and functions of kidney. Write detailed account of renin-angiotensin- aldosterone system.

**Q3) Answer the following (Any 7)**

**[35]**

- a) Explain anatomy of spinal cord and comment on reflex arc.
- b) Give functions of digestive system. Explain role of parasympathetic nervous system in GIT.
- c) Write a short note on : creatinine phosphate and body energetics.
- d) Explain structure and functions of liver
- e) Discuss in detail structure and functions of ovary.
- f) Describe in detail the steps involved in protein synthesis.
- g) Explain regulation of respiration.
- h) Write in detail about pancreatic hormones.
- i) Discuss spermatogenesis.



Total No. of Questions : 3]

SEAT No. :

P888

[Total No. of Pages : 2

[5854]-202

F.Y.B. Pharmacy

PHARMACEUTICAL ORGANIC CHEMISTRY - I

(2018 Pattern) (Semester - II) (BP 202T)

Time : 3 Hours]

[Max. Marks : 75

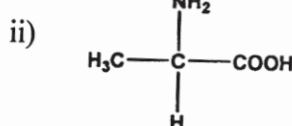
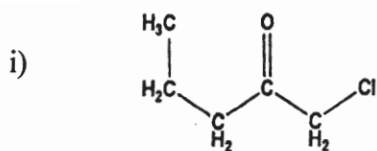
Instructions to the candidates:

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

Q1) Answer all the questions :

[10 × 2 = 20]

- a) Write any 2 qualitative tests for carboxylic acids.
- b) Define following terms
  - i) Electrophile
  - ii) Nucleophile
- c) Define and Classify structural isomerism.
- d) Explain Stability of conjugated dienes.
- e) Enlist factors affecting SN1 and SN2 reactions.
- f) Write Structure and uses of ethyl chloride & Chloroform.
- g) Draw structures from IUPAC names of following.
  - i) Butanal
  - ii) 2-Chlorobutanoic acid
- h) Write uses of paraffins.
- i) Why Chloro acetic acid is stronger than acetic acid? Explain.
- j) Give the IUPAC name of the following compounds.



P.T.O.

**Q2)** Solve any two of the following : **[2 × 10 = 20]**

- a) What are Elimination Reactions? Discuss the mechanism, Stereochemistry, kinetics and orientation involved in Elimination reaction.
- b) Define and classify Hybridization. Explain  $SP^3$  hybridization in alkane.
- c) Explain in detail Cannizzaro reaction and Crossed Cannizzaro reaction.

**Q3)** Solve any seven of the following : **[7 × 5 = 35]**

- a) Explain Saytzeffs rule with example.
- b) Explain formation of ammonia and its geometry on the basis of hybridization.
- c) Give general methods of preparation and reactions of Alkenes.
- d) Write classification of organic compounds with examples.
- e) Explain Aldol condensation.
- f) Explain free radical addition reactions of conjugated dienes.
- g) Write any two methods of preparation and two reactions of alkyl halide.
- h) Compare  $SN1$  and  $SN2$  reactions.
- i) Write note on inductive effect.



Total No. of Questions :3]

SEAT No. :

**P 889**

**[5854]-203**

[Total No. of Pages : 4

**First Year B.Pharm.**

**BIOCHEMISTRY**

**(2018 Pattern) (Semester-II) (BP203T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer all the MCQ's

**[20]**

- i) Amino acids are
  - a) Containing amino group
  - b) Containing carboxyl group
  - c) Containing amino and carboxyl group
  - d) Containing amido and carboxyl group
- ii) Which of the following is imino acid?
  - a) Tyrosine
  - b) Proline
  - c) Tryptophan
  - d) All of the above
- iii) Ligases are
  - a) Enzymes involved in addition of water
  - b) Enzymes involved in removal of water
  - c) Enzymes involved in joining two molecules
  - d) Enzymes involved in isomerization reactions
- iv) Enzyme inhibition means
  - a) Decrease in catalytic activity of enzyme
  - b) Metabolism of enzymes
  - c) Synthesis of enzymes
  - d) All of the above
- v) Glycolysis results in generation of
  - a) 9 ATP
  - b) 7 ATP
  - c) 5 ATP
  - d) 11 ATP

**P.T.O.**

- vi) ETC Pathway involves
- |                    |                   |
|--------------------|-------------------|
| a) Five complexes  | b) Four complexes |
| c) Three complexes | d) Two complexes  |
- vii) 1 NADH is converted into 2.5 ATP by
- |                       |                            |
|-----------------------|----------------------------|
| a) NADH dehydrogenase | b) Succinate dehydrogenase |
| c) ATP synthase       | d) ATP Reductase           |
- viii) Vitamins involved in Kreb's cycle
- |               |                     |
|---------------|---------------------|
| a) Thiamine   | b) Niacin           |
| c) Riboflavin | d) All of the above |
- ix) Debranching enzyme is involved in
- |                 |                   |
|-----------------|-------------------|
| a) Glycogenesis | b) Glycogenolysis |
| c) Glycolysis   | d) Kreb's cycle   |
- x) Ketone bodies formation occurs in
- |           |                    |
|-----------|--------------------|
| a) Lungs  | b) Liver           |
| c) Kidney | d) Skeletal muscle |
- xi) Beta Oxidation of fatty acid is
- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| a) Oxidation at $\beta$ - Carbon  | b) Oxidation at $\alpha$ - Carbon |
| c) Oxidation at $\omega$ - Carbon | d) Oxidation at $\delta$ - Carbon |
- xii) Atherosclerosis is
- |                                |
|--------------------------------|
| a) Accumulation of lipids      |
| b) Hardening of arteries       |
| c) Both (a) & (b)              |
| d) Accumulation of cholesterol |
- xiii) The codon that terminates protein biosynthesis
- |        |                 |
|--------|-----------------|
| a) UAA | b) UAG          |
| c) UGA | d) All of above |
- xiv) Which of the following enzymes associated with hyperuricemia
- |                            |                |
|----------------------------|----------------|
| a) PRPP Synthetase         | b) HGPRT       |
| c) Glucose B - Phosphatase | d) All of them |



- xv) Gout is
- Over production of urea
  - Over production of uric acid
  - Low production of urea
  - Low production of uric acid
- xvi) Proof reducing activity in DNA application is done by
- DNA polymerase I
  - DNA polymerase II
  - DNA polymerase III
  - All of the above
- xvii) Transcription process is
- DNA to DNA
  - DNA to RNA
  - RNA to Protein
  - RNA to DNA
- xviii) Biosynthesis of protein is called as
- Replication
  - Transcription
  - Translation
  - Proteinogenesis
- xix) As per Michaelis Menten equation
- $K_m$  is equal to concentration of product
  - $K_m$  is equal to concentration of substrate
  - $K_m$  is equal to concentration of enzyme
  - $K_m$  is equal to concentration of catalyst.
- xx) Gout is
- Excess of uric acid in blood
  - Excess of uric acid in joints
  - Pain in joints
  - All of the above

**Q2) Long Answer (Any 2 out of 3)**

**[20]**

- Describe glycogen metabolism in detail. Add a note on GSDs.
- Explain semi conservative model of DNA. Add a note on DNA replication.
- Explain Beta oxidation of odd and even number fatty acid in detail.

**Q3) Short answers (Any 7 out of 9)**

**[35]**

- a) Define and classify enzymes. Add a note on enzyme specificity.
- b) Explain oxidative phosphorylation.
- c) Explain urea cycle in detail.
- d) Define and classify amino acids. Add physical and chemical properties of it.
- e) Elaborate on disorders in purine metabolism - Gout.
- f) Describe organization of mammalian genome.
- g) Describe transamination and deamination.
- h) Add a note on ketone bodies formation and utilization.
- i) Explain biological role and utilization of cholesterol.



Total No. of Questions : 3]

SEAT No. :

**P890**

[Total No. of Pages : 2

[5854]-204

**First Year B. Pharmacy**

**PATHOPHYSIOLOGY**

**(2018 Pattern) (Semester - II) (BP204T)(Theory)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer all the questions (Objectives) (Two marks each) :

**[10×2=20]**

- a) Define hypertension and atherosclerosis.
- b) Explain signs and symptoms of hypothyroidism.
- c) Define and enlist the types of epilepsy.
- d) Explain the clinical complication of hypertension.
- e) Explain sign and symptoms of Alzheimer's disease.
- f) Define benign and malignant tumor.
- g) Explain the cause of stroke.
- h) Enlist the sign and symptoms of tuberculosis.
- i) Explain sign and symptoms of AIDS.
- j) Define anaemia and enlist its types.

**P.T.O.**

**Q2) Long Answers (Any 2 out of 3) :**

**[2×10=20]**

- a) Define cancer. Explain in detail pathophysiology of cancer.
- b) Define diabetes mellitus. Explain causes, sign and symptoms of diabetes mellitus. Enlist the complication associated with it.
- c) Define inflammation. Explain different types of inflammation and its mechanism.

**Q3) Short Answers (Any 7 out of 9) :**

**[7×5=35]**

- a) Explain pathophysiology of depression.
- b) Define meningitis. Explain pathophysiology meningitis.
- c) Explain sign, symptoms etiology and pathogenesis of hepatitis A.
- d) Define goiter. Enlist causes, sign and symptoms of goiter.
- e) Explain in detail pathophysiology of acute renal failure.
- f) Enlist the types of sexually transmitted disease. Describe pathogenesis of gonorrhoea.
- g) Define peptic ulcer. Differentiate between gastric and duodenal ulcer.
- h) Define Anemia. Explain causes, sign and symptoms of sickle cell anemia.
- i) Explain pathophysiology of myocardial infraction.



[5854] - 301

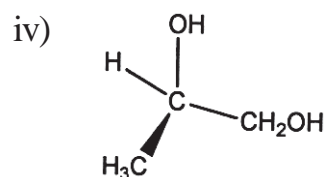
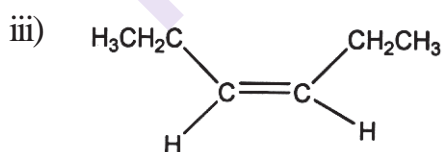
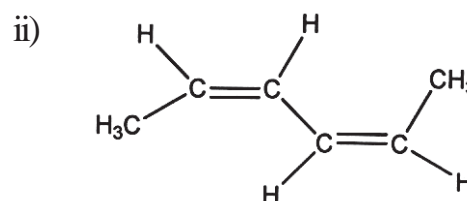
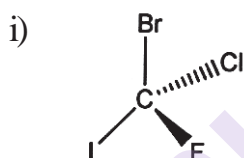
S.Y. B.Pharmacy

**PHARMACEUTICAL ORGANIC CHEMISTRY - II****(2018 Pattern) (Semester - III) (Theory) (BP301T)***Time : 3 Hours]**[Max. Marks : 75**Instructions to the candidates :*

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

**Q1)** Attempt the following (Any Five) :**[5 × 3 = 15]**

- a) Draw resonance structures for Nitrobenzene.
- b) Comment on acidity of phenol.
- c) Assign the configuration to following (any three).



- d) Discuss meso compounds with suitable examples.
- e) Discuss chiral and achiral compounds.
- f) Explain  $4n+2$  rule of aromaticity with example.
- g) Compare basicity of Methyl amine and aniline.

*P.T.O.*

**Q2)** Attempt the following (Any Two) :

**[2 × 10 = 20]**

- a) What are electrophilic aromatic substitution reactions. Explain Nitration and halogenation of benzene with stepwise mechanism.
- b) Discuss structure, reactions, synthesis and medicinal uses of following polycyclic compounds :
  - i) Phenanthrene
  - ii) Anthracene
- c) What are amines. Classify with example. Write any three reactions and three methods of preparations of amines.
- d) What is optical activity? Explain Enantiomerism and Diastereomerism with suitable examples.

**Q3)** Attempt the following (Any Eight) :

**[8 × 5 = 40]**

- a) Write uses of resorcinol and naphthols and draw structure of any two derivatives.
- b) Explain in brief Bayer's strain theory with limitations of Bayer's strain theory.
- c) Write mechanism of Friedel-Craft's acylation reaction.
- d) -NO<sub>2</sub> group is meta directing towards electrophilic substitution reaction. Explain.
- e) Explain any two methods for the synthesis of triphenylmethane.
- f) How will you distinguish primary, secondary and tertiary amines by chemical test.
- g) Explain in brief saponification and rancidity of oils.
- h) Discuss in detail theory of strainless rings.
- i) Explain in detail Geometrical isomerism.
- j) What are cycloalkanes? Explain Coulson and Moffitt's modification.



Total No. of Questions : 3]

SEAT No. :

**P892**

[Total No. of Pages : 2

**[5854]-302**

**S.Y. B. Pharmacy**

**PHYSICAL PHARMACEUTICS - I**  
**(2018 Pattern) (Semester - III) (BP 302T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Attempt any five :

**[5 × 3 = 15]**

- a) Explain Fick's first law of diffusion.
- b) Define critical temperature, critical pressure and critical volume.
- c) Explain Gibb's phase rule.
- d) What are optically active substances?
- e) Explain invariant and univariant systems as per Gibb's phase rule.
- f) Explain significance of buffer capacity.
- g) Explain hydrogen bonding.

**Q2)** Attempt any two :

**[2 × 10 = 20]**

- a) Elaborate on Raoult's law and its deviations with examples.
- b) Explain Nernst's distribution law and deviations from the law.
- c) Classify surfactants with examples. Give the HLB scale and write about applications of surfactants.
- d) Classify complexes and enlist methods of analysis of complexes. Give applications.

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

**Q3) Answer any eight :**

**[8 × 5 = 40]**

- a) Write a note on Polymorphism.
- b) Explain 2-component system with phase diagram.
- c) Write a note on dissociation constants and its applications.
- d) Explain about different methods for pH determination.
- e) Explain capillary rise method for determination of surface tension.
- f) Explain principle of liquefied propellants in aerosols.
- g) Enlist factors affecting solubility of liquids in liquids.
- h) Write a note on micellar solubilization.
- i) Write a note on vapor pressure.
- j) Write a note on boiling point elevation as a colligative property.





Total No. of Questions :3]

SEAT No. :

**P 893**

**[5854]-303**

[Total No. of Pages : 2

**S.Y. B.Pharmacy**  
**PHARMACEUTICAL MICROBIOLOGY**  
**(2018 Pattern) (Semester-III)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer the following (any five)

**[5×3=15]**

- a) Differentiate between Gram positive and Gram negative bacterial cell.
- b) Define
  - i) D-value
  - ii) Z-value
  - iii) Culture media
- c) Write the importance of fungi.
- d) Enlist different factors influencing disinfectant action.
- e) Enlist different sources of contamination in an aseptic area.
- f) Write a function of flagella, pilli and cell wall.
- g) Comment “moist heat sterilization is more superior to dry heat sterilization”.

**Q2)** Answer the following (any two)

**[2×10=20]**

- a) Write in detail the different sources and types of microbial contamination of pharmaceutical products. Write a note on assessment of microbial contamination and spoilage.
- b) Write in detail identification of bacteria using different staining techniques.
- c) Define culture media and explain different types of culture media.
- d) What is microbiological assay? Discuss in detail general methods used for microbial assay of antibiotics as per I.P.

**P.T.O.**

**Q3) Answer the following (any eight)**

**[8×5=40]**

- a) Write working, applications, advantages & limitations of autoclave.
- b) Write in detail growth curve of bacteria.
- c) Explain the different methods used for isolation of pure cultures.
- d) Explain the different methods used for cultivation of human viruses.
- e) Describe in detail chemical agents as disinfectants.
- f) Explain different branches of microbiology.
- g) Write a note on Dark field microscopy.
- h) Write a note on laminar air flow equipments.
- i) Write preservation of pharmaceutical products using antimicrobial agents.
- j) Explain in detail the applications of cell culture in pharmaceutical industry and research.



Total No. of Questions : 3]

SEAT No. :

**P894**

[Total No. of Pages : 2

[5854]-304

**Second Year B. Pharmacy**  
**PHARMACEUTICAL ENGINEERING**  
**(2018 Pattern) (Semester - III) (BP 304T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer the following questions (any five) :

**[15]**

- a) Classify the materials of plant construction. Explain the use of Ferrous Metal.
- b) What is Reynold's Number? Write its significance.
- c) Classify evaporators. Explain the term evaporator capacity.
- d) Define distillation. Draw a neat and labelled diagram showing simple distillation assembly arrangement for lab scale processing.
- e) What are filter aids? List the functions of filter aids.
- f) Write a note on mechanism of mixing for Liquids.
- g) Explain : Elutriation Tank.

**Q2)** Attempt any two from the following :

**[20]**

- a) Define size reduction. What are its objectives? With the help of neat diagram describe in detail Ball Mill.
- b) What do you understand by "multiple effect evaporator"? Describe one such evaporator. How do you feed such evaporator?

**P.T.O.**

- c) Explain the principle, construction, working, uses, merits and demerits of perforated basket centrifuge.
- d) Describe in detail objectives, applications and mechanism of heat transfer. Add a note on Black Body and Grey Body.

**Q3)** Attempt any eight of the following questions :

**[40]**

- a) Explain the Bernoulli's theorem with its applications.
- b) Describe the mechanism and laws governing size reduction.
- c) Explain principle, construction & working of sieve shaker.
- d) Write a note on heat exchanger?
- e) Explain principle, construction and working of climbing film evaporator.
- f) Explain the Fractional distillation with suitable example.
- g) Explain the mechanism of drying process.
- h) Explain the mechanism of solid mixing.
- i) Describe principle, construction & working of plate and Frame Filter.
- j) Explain the types of Corrosion and their prevention.



Total No. of Questions : 3]

SEAT No. :

**P895**

[Total No. of Pages : 2

**[5854]-401**

**S.Y. B.Pharmacy**

**PHARMACEUTICAL ORGANIC CHEMISTRY - III (Theory)**

**(2018 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer the following questions. (Solve 5 out of 7) **[15]**

- a) Give three necessary conditions for optical activity in Biphenyls.
- b) Define Chiral auxillary and give one example.
- c) Explain with example what are stereospecific reactions.
- d) Explain any two reactions of chiral molecules.
- e) Justify why pyrrole undergoes Electrophilic substitution reaction only at 2 or 5 position?
- f) Write any two reactions of Indole.
- g) Discuss the chemistry of pyridine.

**Q2)** Answer the following questions. (Solve 2 out of 4) **[20]**

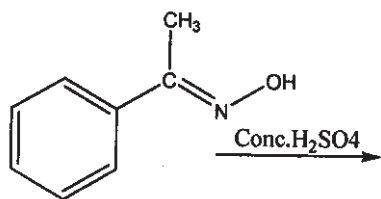
- a) Explain in detail methods of resolution of racemic mixture.
- b) Explain in detail mechanism and applications of Pinacol-Pinacolone rearrangement.
- c) Discuss the chemistry, reactions, synthesis and medicinal uses of Oxazole.
- d) Write the synthesis, reactions, medicinal uses and derivatives of Imidazole.

**P.T.O.**

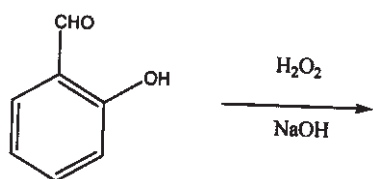
**Q3)** Write short notes on: (Solve 8 out of 10)

**[40]**

- a) Explain conformational isomerism in n-Butane.
- b) Complete the reaction with mechanism:



- c) Complete the reaction with mechanism:



- d) Explain mechanism of Bayer Villiger oxidation.
- e) Give the following details of Pyrrole.
  - i) reactions (any 2)
  - ii) synthesis (any 01)
- f) Outline the reaction and medicinal uses of Thiophene.
- g) Describe the chemistry and medicinal uses of Acridine.
- h) Explain one synthetic method and two characteristic reaction of Furan.
- i) Write the following reactions of Pyrazole.
  - i) Nitration
  - ii) Halogenation
  - iii) Oxidation
- j) Draw the structure, give the numbering and mention one derivative of following Heterocyclic compounds.
  - i) Quinoline
  - ii) Isoquinoline
  - iii) Thiazole



Total No. of Questions : 3]

SEAT No. :

**P896**

[Total No. of Pages : 2

**[5854]-402**

**S.Y. B.Pharmacy**

**MEDICINAL CHEMISTRY - I (Theory)**

**(2018 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Attempt the following. (Any Five)

**[5×3=15]**

- a) Explain AChE inhibitors.
- b) Draw structure, write mechanism of action and medicinal applications of Diazepam.
- c) Define nonsteroidal anti-inflammatory agents. Write Classification of NSAIDs with examples.
- d) Write synthesis of Dicyclomine hydrochloride.
- e) Explain reduction reaction in drug metabolism.
- f) Write synthesis of Propranolol.
- g) Explain role of partition coefficient in drug action.

**Q2)** Attempt the following. (Any Two)

**[2×10=20]**

- a) Explain cholinergic receptors and stereochemistry of acetylcholine.
- b) Elaborate on Biosynthesis, release and metabolism of noradrenaline.
- c) What is epilepsy? Write classification of anticonvulscent agents with examples. Write SAR of Hydantoins as anticonvulscent agents.
- d) What are narcotic analgesics? Write SAR of Morphine analogues.

**P.T.O.**

**Q3)** Attempt the following. (Any Eight)

**[8×5=40]**

- a) Explain Cholinergic agonists Mode of action and SAR of various agents.
- b) Illustrate the structure, synthesis, and uses of Tolazoline.
- c) Classify adrenergic receptors and mention their importance.
- d) Write structure, IUPAC name and mechanism of action of Labetolol.
- e) Explain the role of Beta 2 agonists in the treatment of asthma.
- f) Explain role of Ionisation on drug action.
- g) Write a note on Narcotic antagonists.
- h) Write a note on Phase II reactions of drug metabolism.
- i) Write a note on Factors affecting drug metabolism.
- j) Write SAR of phenothiazine as antipsychotic agents.





Total No. of Questions : 3]

SEAT No. :

P897

[Total No. of Pages : 2

[5854]-403

S. Y. B.Pharmacy

PHYSICAL PHARMACEUTICS - II

(2018 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

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

Q1) Answer the following (any 5 out of 7)

[5 × 3 = 15]

- a) Write application of rheology.
- b) Write application of chemical kinetics.
- c) How do you select a viscometer?
- d) When methylcellulose is added to water, the viscosity increases? Why?
- e) Write classification of colloids.
- f) How to develop formulation by HLB consideration.
- g) Write a note on the Coulter counter apparatus for particle analysis.

Q2) Answer the following (any 2 out of 4)

[2 × 10 = 20]

- a) Enlist and explain methods for particle size analysis.
- b) Classify viscometer and explain the principle, working, and application of ostwald viscometer and cup and bob viscometer.
- c) Classify and explain the type of Flow.
- d) Compare first and second order reaction. Discuss different methods used for determining the order of a reaction.

P.T.O.

**Q3)** Write a short note on the following (any 8 out of 10)

**[8 × 5 = 40]**

- a) Deformation of solids
- b) Degradation pathways
- c) Particle surface area
- d) Accelerated stability studies.
- e) Electrical and optical properties of colloids.
- f) Stability of emulsion.
- g) True density, Bulk density and porosity.
- h) HLB
- i) Electric double layer
- j) Particle size distribution.



Total No. of Questions : 3]

SEAT No. :

P993

[Total No. of Pages : 2

[5854]-404

Second Year B. Pharmacy

PHARMACOLOGY - I

(2018 Pattern) (Semester - IV) (Credit System)

Time : 3 Hours]

[Max. Marks : 75

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.

Q1) Objective Type Questions (Answer 5 out of 7) :

[5 × 3 = 15]

- a) What is prodrug? Give two examples.
- b) Write definition and uses of local anesthesia
- c) Define Teratogenicity and give two examples.
- d) Define tachyphylaxis with example.
- e) Explain enzyme inhibition with one example.
- f) Mention two rational uses of adrenaline.
- g) Define and Classify Drug Interactions.

Q2) Long Answers (Any 2 out of 4) :

[2 × 10 = 20]

- a) What is metabolism of drugs? Explain stages of metabolism with details of enzymes involved in metabolism. Add a note on enzyme induction with suitable example.
- b) Define and Classify Adverse Drug Reactions with suitable examples. Write factors affecting ADR and add a note on Pharmacovigilance.
- c) Write detailed Pharmacology of Alcohol and add a note on Disulphiram and its effects
- d) Classify sympatholytics. Write mechanism of action, pharmacological action, adverse effects and uses of propranolol.

P.T.O.

**Q3) Short Answers (Any 8 out of 10) :**

**[8 × 5 = 40]**

- a) Define and classify general Anesthetics and write a note on stages of anesthesia.
- b) What is the rational use of medicine? Write a note on a rational drug prescribing.
- c) What is DRC? Explain competitive and noncompetitive antagonism with the help of DRC. Give two example each of competitive and noncompetitive antagonism.
- d) Classify alpha adrenergic blockers with MOA, ADR and Uses
- e) Define drug distribution, write factors affecting it and add a note on volume of distribution.
- f) Classify neuromuscular blocking agents. Describe mechanism of action, adverse effects and uses of nondepolarizing blockers.
- g) Classify various drugs used for the treatment of Parkinson's disease. Explain the "on and off" phenomenon related to Parkinson's disease in clinical practice.
- h) Define and classify antipsychotic drugs. Write uses, MOA and ADR of Chlorpromazine.
- i) Explain pharmacokinetic terms Bioavailability and Half-life in detail.
- j) Write a note on Dale's vasomotor reversal.



Total No. of Questions : 3]

SEAT No. :

P898

[Total No. of Pages : 2

[5854]-405

S.Y. B.Pharmacy

PHARMACOGNOSY AND PHYTOCHEMISTRY - I

(2018 Pattern) (Semester - IV) (BP 405T) (Theory)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates :

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

Q1) Attempt the following.(Any 5)

[5 × 3 = 15]

- a) Define
  - i) Stomatal index
  - ii) Unorganized drugs
  - iii) Flavonoid
- b) Mention therapeutic uses and commercial utility of Papain.
- c) Give biological source, chemical components & uses of following natural fibers.
  - i) Cotton
  - ii) Jute.
- d) Give chemical tests along with significance for the following.
  - i) Molisch's test
  - ii) Salkowski test
  - iii) Legal's test
- e) Define and classify essential oils & resins with examples.
- f) Give extraction method of Castor oil.
- g) Describe morphological character of bark.

P.T.O.

**Q2)** Attempt the following. (Any 2)

**[2 × 10 = 20]**

- a) Define and classify Glycosides with example. Write test to identify different types of Glycosides.
- b) What is evaluation of crude drugs? Write a note on physical & chemical evaluation.
- c) Discuss the various types and nutritional requirement of plant tissue culture. Enlist the important application of PTC.
- d) Discuss the significance of primary and secondary metabolites by giving suitable examples.

**Q3)** Answer the following. (Any 8)

**[8 × 5 = 40]**

- a) Give quantitative microscopic evaluation of crude drug with reference to lycopodium spore method.
- b) Discuss importance of marine pharmacognosy & its future. Describe efficacy of anticancer marine drugs.
- c) Write note on Polyploidy.
- d) What are Phytohormones? Give function of any two Plant hormones.
- e) What are Natural allergens? Describe different types of natural allergens giving their effects.
- f) Define crude drugs? How do you classify Crude drugs?
- g) Method of extraction of wool fat.
- h) Write a note on adulteration of crude drugs with suitable examples.
- i) Discuss in brief conservation of Medicinal plants.
- j) Compare following
  - i) Gums & Mucilage
  - ii) True alkaloids & Pseudo alkaloids.



Total No. of Questions : 3]

SEAT No. :

P899

[Total No. of Pages : 2

[5854]-501

**Third Year B. Pharmacy  
MEDICINAL CHEMISTRY - II**

**(2018 Pattern) (Semester - V) (Theory) (BP 501 T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

*All questions are compulsory.*

**Q1)** Attempt the following (Any five) :

**[5×3=15]**

- Write MOA & Medicinal applications of verapamil.
- Write MOA & Medicinal applications of omeprazole.
- Write MOA & Medicinal applications of Doxylamine.
- Discuss in detail HMG - COA reductase inhibitors.
- Explain in brief anti-coagulants.
- Write a note on drugs for erectile dysfunction.
- Write a note on Anti-thyroid agents.

**Q2)** Attempt the following (Any two) :

**[2×10=20]**

- What is hypertension? Classify antihypertensive agents with examples, write mechanism of action & medicinal applications of drugs belonging to class angiotensin converting enzyme inhibitors.
- What are estrogen? Classify them with examples. Give SAR of estrogens. Give therapeutic uses of estrogens & antiestrogens.
- What is angina pectoris? Classify antianginal agents with examples, write mechanism of action & medicinal applications of drug belonging to class vasodialators.
- Define diuretics. Classify diuretics with examples, write mechanism of action & medicinal applications of drug belonging to class thiazides.

**P.T.O.**

**Q3)** Attempt the following (Any eight) :

**[8×5=40]**

- a) Write synthesis of Furosemide & atenolol.
- b) Write MOA & Medicinal applications of nitroglycerine & amlodipine.
- c) Write MOA & Medicinal applications of hydrofluthiazide & acetazolamide.
- d) Write a note on H<sub>2</sub> receptor antagonists.
- e) Draw structure, write mechanism of action & medicinal applications of promethazine.
- f) Classify corticosteroids in detail.
- g) Elaborate development of H<sub>2</sub> antagonists.
- h) Explain in brief local anaesthetics.
- i) Discuss in brief oral hyperglycemic agents with suitable examples.
- j) Classify antiarrhythmic agents with suitable examples.





Total No. of Questions : 3]

SEAT No. :

**P900**

[Total No. of Pages : 2

**[5854]-502**

**T.Y. B. Pharmacy**

**BP502T : INDUSTRIAL PHARMACY - I**

**(Semester - V) (2018 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer the following (any 2) :

**[20]**

- a) Define tablets. Discuss in detail different additives used in tablet formulation.
- b) Give complete account of environmental control zones in sterile manufacturing facilities. Add a note on HVAC system.
- c) Discuss defects in tablet coating and explain remedies thereof.
- d) What is Pelletization? Describe in detail the process of extrusion pelletization.

**Q2)** Answer the following (any 8) :

**[40]**

- a) Describe construction and principle involved in working of fluidized bed granulator.
- b) Give a detail account on evaluation of granules.
- c) What are the problems involved in filling hard of gelatin capsule?
- d) Explain weight variation test for capsule as per Indian Pharmacopoeia.
- e) Describe controlled flocculation in structured vehicle.
- f) Discuss formulation of soft gelatin capsule.
- g) Write a note on Lipsticks.
- h) What is preformulation? Explain important physicochemical properties of preformulation studies.
- i) Explain importance of base adsorption in soil gels.
- j) What is HLB? Explain its application in formulation of biphasic liquid orals.

**P.T.O.**

**Q3)** Answer the following (any 5) :

**[15]**

- a) Explain glass as packaging material and explain water attack test.
- b) Give various components of aerosol system.
- c) Explain the quality control test of aerosols.
- d) Explain evaluations of ophthalmic preparations.
- e) What is SPF? Discuss in brief about sunscreens.
- f) Give an account on different types of ophthalmic dosage forms.
- g) IPQC test of capsules as per Indian Pharmacopoeia.



Total No. of Questions : 3]

SEAT No. :

P901

[Total No. of Pages : 2

[5854]-503

T.Y. B. Pharmacy

PHARMACOLOGY - II

(2018 Pattern) (Semester - V) (BP 503T) (Theory)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

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

Q3) Attempt **any Five** of the following :

[15]

- a) What are the adverse effects of NSAIDs?
- b) Comment the role of HMG-CoA reductase inhibitors to treat hyperlipidaemia.
- c) Define and classify tocolytics.
- d) Write biosynthesis of prostaglandins.
- e) Enlist mechanism of anti-gout drugs.
- f) Write note on histamine receptors.
- g) Write the advantages of oral hypoglycaemic agent.

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

[20]

- a) Classify antihistamines. Describe Pharmacological action of antihistamine.
- b) Discuss biosynthesis, mechanism of action, pharmacological action and therapeutic uses of progesterone.
- c) Classify antihypertensive drugs? Explain pharmacotherapy for hypertension.
- d) Describe biosynthesis, storage and release of insulin. Add note on insulin preparations.

P.T.O.

**Q3)** Attempt **any Eight** of the following :

**[40]**

- a) Classify antithyroid drug. Explain pharmacological action of any one antithyroid drug.
- b) Write a note on platelet-activating factors.
- c) Write mechanism of acetazolamide and spironolactone.
- d) Support the use sodium channel blockers for treatment of cardiac arrhythmias with example.
- e) Discuss oral contraceptive pills.
- f) Add note on bioassay of Oxytocin.
- g) Justify action of calcium channel blockers for any two cardiovascular diseases.
- h) Explain Pharmacological action of nitrates.
- i) Describe physiological effect of glucagon.
- j) Explain the calcium homeostasis.



Total No. of Questions : 3]

SEAT No. :

**P902**

[Total No. of Pages : 2

**[5854]-504**

**Third Year B. Pharmacy**

**PHARMACOGNOSY AND PHYTOCHEMISTRY - II**

**(2018 Pattern) (Semester - V) (BP504T) (Theory)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1) Objective type questions (Answer 5 out of 7) [15]**

- a) Explain in brief Competitive feeding.
- b) Write a note on umbelliferous fruits.
- c) Give the source and uses of eugenol containing crude drug.
- d) Identification test for Aloes.
- e) Write Source and uses of Podophyllotoxin.
- f) Write a note on UV and visible spectroscopy.
- g) Write the applications of Microwave assisted extraction.

**Q2) Answer the following ( any 2 out of 4) [20]**

- a) Define Alkaloids. Explain Biological source, classification, chemistry and medicinal uses of Belladonna and Opium.
- b) Explain in detail about super critical fluid extraction and solid phase extraction.
- c) Write the Pharmacognostical study of Senna.
- d) Explain industrial method of production and estimation of Vincristine and Atropine.

**P.T.O.**

**Q3)** Answer the following (any 8 out of 10)

**[40]**

- a) Explain Tracer technology and its significance in biogenetic studies.
- b) Describe the microscopy of Clove with a neat labelled diagram.
- c) Give the Pharmacognosy of Vinca
- d) Write the isolation and identification of Quinine.
- e) Explain the industrial production of digoxin.
- f) Describe HPTLC with its advantages and applications.
- g) Give biological source and active constituents of Podophyllum and Vinca.
- h) Write isolation and analysis of Glycyrrhizin.
- i) Differentiate between pale Catechu and Black Catechu.
- j) Give biosources, chemical constituents and uses of Coriander and Belladonna.



Total No. of Questions : 3]

SEAT No. :

P903

[Total No. of Pages : 2

[5854] - 505

Third Year B. Pharmacy

PHARMACEUTICAL JURISPRUDENCE

(BP505T) (2018 Pattern) (Semester - V) (Theory)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates :

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

**Q1) Answer all the questions (Two marks each) :**

**[10× 2 = 20]**

- a) What is Trademark?
- b) Write the members of joint state pharmacy council.
- c) What are schedule K and L?
- d) Write offenses and penalties as per prevention of cruelty to the Animal Act, 1960.
- e) What are the objectives of DPCO, 1995?
- f) Write functions of pharmacy council of India.
- g) What are psychotropic substances?
- h) What is product patent?
- i) Central Register of Pharmacist.
- j) What are misbranded drugs?

**Q2) Long answers (Any 2 out of 3) :**

**[2 × 10 = 20]**

- a) Write qualification, powers and duties of Drug inspector.
- b) Discuss in detail the objectives and salient features of Drug and Magic remedies Act and rules 1976.
- c) Give the constitution and functions of Drugs Technical Advisory Board (DTAB) and Drug consultative committee (DCC) as per Drugs & cosmetics Act & Rules.

**P.T.O.**

**Q3) Short Answers (Any 7 out of 9) :**

**[7× 5 = 35]**

- a) Prices of Bulk Drugs.
- b) What is patent infringement? Explain its significance.
- c) Qualification and duties of Government Analyst under D & C Act.
- d) Exempted class of advertisements as per Drugs & Magic Remedies Act.
- e) Explain Bonded Manufactory.
- f) Drug Enquiry committee.
- g) Pharmaceutical code of ethics.
- h) Loan license.
- i) Geographical indications.



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Total No. of Questions : 3]

SEAT No. :

P904

[Total No. of Pages : 2

[5854]-601

T.Y.B. Pharmacy

MEDICINAL CHEMISTRY - III (Theory)

(2018 Pattern) (Semester - VI)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

- 1) All questions are compulsory, Internal choices are given.
- 2) Figures to the right indicate full marks.
- 3) Draw neat diagrams and structures wherever necessary.

Q1) Objective type questions (answer 5 out of 7) :

[5 × 3 = 15]

- a) Define and classify antifungal agents with suitable examples.
- b) Give structure and uses of any three antibiotics which have site of action on cell wall.
- c) Define and classify antimalarial agents with suitable examples.
- d) Define and classify antibiotics with suitable examples.
- e) Give structure and uses of any three drug from class cinchona alkaloids.
- f) Draw the structure of penam, cepham and beta lactam ring.
- g) Fill in the blanks :
  - i) \_\_\_\_\_ are drugs that have the capability of ridding the body of parasitic worms.
  - ii) Malaria, Amoebiasis, Giardiasis, Trichomoniasis, Taxoplasmosis are \_\_\_\_\_ disease.
  - iii) Antibacterial aniline substituted suphonamides are called as \_\_\_\_\_.

P.T.O.

**Q2) Long answer (answer 2 out of 4) :**

**[2 × 10 = 20]**

- a) Discuss various physicochemical parameters used in QSAR and add a note on Hansch QSAR analysis.
- b) Describe the chemistry, SAR and MOA of aminoglycoside antibiotics.
- c) Define and classify anticancer agents with suitable examples, explain in detail alkylating agents & plants products.
- d) Describe the chemistry, SAR and MOA of quinolines antimalarial agents.

**Q3) Short answer (Answer 8 out of 10) :**

**[8 × 5 = 40]**

- a) Describe the SAR and MOA of Antifungal azoles.
- b) Explain MOA of sulphonamide.
- c) Draw the scheme of synthesis for chloroquine.
- d) Elaborate about antitubercular agents.
- e) Elaborate about antileprotic agents.
- f) Draw the scheme of synthesis for chloramphenicol.
- g) Discuss chemistry, MOA of plant products use as antineoplastic agents.
- h) Write a note on anthelmintic drugs.
- i) Discuss polyene antibiotics.
- j) Write a note on Ferguson principle.



Total No. of Questions : 3]

SEAT No. :

**P905**

[Total No. of Pages : 2

**[5854]-602**

**T.Y. B. Pharmacy**  
**PHARMACOLOGY - III**  
**(2018 Pattern) (Semester - VI)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Objective type questions (answer 5 out of 7) each question carries 3 marks. **[15]**

- a) Define acute, subacute and chronic toxicity.
- b) Elaborate the term carcinogenicity and teratogenicity.
- c) Enlist adverse effect and uses of chloramphenicol.
- d) Classify antileprotic drugs.
- e) Write clinical symptoms & management of organophosphorus compound.
- f) Give mechanism of action and adverse effect of aminoglycoside.
- g) Write symptoms and treatment of lead poisoning.

**Q2)** Long Answers (Answer 2 out of 4) each question carries 10 marks. **[20]**

- a) Write general principles of treatment of poisoning.
- b) Define and classify macrolides antibiotics. Give pharmacology of erythromycin.
- c) Classify cephalosporin. write mechanism of action, adverse effect and uses of cephalosporin.
- d) Describe mechanism of action. antibacterial spectrum, adverse effect and uses of sulphonamide.

**P.T.O.**

**Q3)** Short answers (Answer 8 out of 10) each question carries 5 marks. **[40]**

- a) Explain mechanism of action, adverse effects and uses of tetracycline and Fluoroquinolones.
- b) Classify anti-tubercular drugs. Describe mechanism of action, resistance, adverse effects and uses of isoniazid and rifampicin.
- c) Classify anti-asthmatic drugs. Explain pharmacology of bronchodilator drugs.
- d) Classify anti-ulcer drugs. Illustrate pharmacology of proton pump inhibitors and H1 antihistaminic drugs.
- e) Write a brief note on non-systemic antacids.
- f) Write a short note on pharmacotherapy of diarrhoea.
- g) Classify anticancer drugs. Write a detail note on alkylating agents.
- h) Classify penicillin antibiotics and give an account on extended spectrum penicillin.
- i) classify immunosuppressant drugs and write a detail note on antibodies used as immunosuppressant.
- j) Define Biological clock and write their significance leading to chromotherapy.



Total No. of Questions :3]

SEAT No. :

**P 906**

**[5854]-603**

[Total No. of Pages : 2

**T.Y. B.Pharmacy**

**HERBAL DRUG TECHNOLOGY**

**(2018 Pattern) (Semester - VI) (Theory) (BP603T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Objective type questions (Answer 5 out of 7).

**[5×3=15]**

- a) Write a note on Unani system of medicine.
- b) Explain in detail possible side effects and interaction of Garlic.
- c) Describe method of preparation for Avaleha.
- d) Define binder along with classification and advantages.
- e) Add a note on plant based industries involved in work on medicinal and aromatic plants.
- f) Explain about CITES certification.
- g) Elaborate the guidelines for GAP guidelines.

**Q2)** Answer the following (Any 2 out of 4).

**[2×10=20]**

- a) What are ayurvedic formulations? Describe in detail method of preparation and general standardization parameter for Asava and Arishta as per Ayurvedic Pharmacopoeia.
- b) Explain in detail Patent, Patenting aspects of traditional knowledge and natural product along with case studies for Neem and Curcuma.
- c) Describe in detail ICH guidelines for the assessment of herbal drug, stability testing of herbal drug.
- d) Brief note on Novel Herbal formulations, advantages and describe any one novel Herbal formulation.

**P.T.O.**

**Q3)** Answer the following (Any 8 out of 10)

**[8×5=40]**

- a) Describe five element and tridosha theory involved in Ayurveda.
- b) Write a role of Alfalfa and honey as herbal dietary supplement.
- c) Discuss the manufacturing process and evaluation parameters for herbal tablet.
- d) What is herbal excipient? Write down about the significance of natural excipients with suitable examples.
- e) Describe Herbal drug interactions? Explain with suitable examples.
- f) Explain in detail regulatory issues-regulation in India (ASU DTAB, ASU DCC) provisions relating to Ayurvedic, Siddha and Unani system of medicine.
- g) Explain the Spirulina as nutraceutical.
- h) Explain in detail about sources and description of raw materials of herbal origin used for Skin cosmetics.
- i) Write a note on GMP for AYUSH formulation.
- j) Explain the importance of primary processing, garbling, drying and preservation in the processing of herbal raw material.



Total No. of Questions : 3]

SEAT No. :

**P907**

[Total No. of Pages : 2

[5854]-604

**Third Year B. Pharmacy**

**BIOPHARMACEUTICS AND PHARMACOKINETICS**

**(2018 Pattern) (Semester - VI) (BP 604T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Neat labeled diagrams must be drawn wherever necessary.*

**Q1)** Answer the following (Any 5) :

**[15]**

- a) What are different pathways of drug absorption?
- b) Define and explain ivivc.
- c) Define and explain renal clearance.
- d) What is the basic role of Phase I reactions?
- e) What are minor pathways of drug elimination?
- f) Why are drugs better absorbed from small intestine?
- g) What are the advantages of administering a drug by constant rate i.v. infusion over oral administration?

**Q2)** Answer the following (Any 2) :

**[20]**

- a) Discuss the assumptions, limitation and significance of pH - partition hypothesis.
- b) Discuss various factors that are responsible for differences in drug distribution in the body.

**P.T.O.**

- c) Explain Biopharmaceutical classification system and its significance with respect to ivivc.
- d) What is non-linear pharmacokinetics? Give reasons with examples for non-linear pharmacokinetics shown by drugs.

**Q3) Answer the following (Any 8) :**

**[40]**

- a) Discuss the factors that influence the gastric emptying rate.
- b) How are sink conditions maintained at the site of absorption?
- c) What are various sites of drug metabolism in the body?
- d) What are the factors that influence passive reabsorption of drugs renal tubules?
- e) What are various approaches used to enhance bioavailability of drug from its dosage form.
- f) Why is placental barrier not as effective as Blood Brain Barrier.
- g) Explain which parameters decide time to reach steady state plasma concentration of drug after i.v. infusion.
- h) Name the methods used to calculate  $K_E$  from urinary excretion data. What are the advantages of urinary data over plasma data?
- i) Explain advantages of physiological model over compartmental model.
- j) Explain statistical methods used in BA/BE studies.





Total No. of Questions : 3]

SEAT No. :

**P908**

[Total No. of Pages : 2

**[5854]-605**

**T.Y. B.Pharmacy**

**PHARMACEUTICAL BIOTECHNOLOGY**

**(2018 Pattern) (Semester - VI) (BP605T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer 5 out of 7.

**[5×3=15]**

- a) What is biotechnology? Enlist applications of biotechnology with reference to pharmaceutical sciences.
- b) Enlist applications of immobilized enzymes.
- c) Highlight use of microbes in industry.
- d) Explain basic principle of genetic engineering.
- e) Give brief overview of protein engineering.
- f) Discuss aeration process used in fermentation.
- g) Describe the principle of southern blotting.

**Q2)** Answer 2 out of 4.

**[2×10=20]**

- a) What is recombinant DNA technology? Summarize applications of recombinant DNA technology and discuss production of recombinant insulin.
- b) What is hybridoma technology? Discuss production of monoclonal antibodies by hybridoma technology and their applications.
- c) What are hypersensitivity reactions? Classify hypersensitivity reactions and explain them in detail.
- d) What is fermentation? Highlight general requirements of fermentation and discuss production of penicillins by fermentation technology.

**P.T.O.**

**Q3)** Answer 8 out of 10.

**[8×5=40]**

- a) Discuss working and applications of biosensors in pharmaceutical industries.
- b) Explain restriction endonuclease with example.
- c) Write a note on ELISA.
- d) What is cloning vector? Explain plasmid as a cloning vector.
- e) Discuss general method of preparation of bacterial vaccines.
- f) Write a note on polymerase chain reaction (PCR).
- g) Explain the structure of immunoglobulin.
- h) Write a note on microbial biotransformation.
- i) Describe collection, processing and storage of whole human blood.
- j) What is mutation ?Summarize types of mutation.

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Total No. of Questions : 3]

SEAT No. :

[Total No. of Pages : 2

**P909**

**[5854]-606**

**Third Year B. Pharmacy**

**PHARMACEUTICAL QUALITY ASSURANCE**

**(2018 Pattern) (Semester - VI) (BP 606T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Attempt any five of the following.

**[15]**

- a) What is GMP? Give its importance.
- b) What is the role and functions of WHO?
- c) Briefly describe the importance of training in pharmaceutical manufacturing.
- d) Outline a general format for SOP.
- e) Write about QSEM concepts in ICH guidelines.
- f) How complaints are handled in pharmaceutical industry?
- g) How is scrap and waste material disposed in pharmaceutical industry?

**Q2)** Answer any two of the following.

**[20]**

- a) Explain the concept of quality by design (QbD). Write in detail about steps in QbD approach.
- b) What is analytical method? Explain the parameters for analytical method validation.
- c) Explain the major quality control tests for paper boards and cartons.
- d) Discuss the different documents (BFR, MFR and SOP) maintained in pharmaceutical industry.

**P.T.O.**

**Q3)** Attempt any eight of the following.

**[40]**

- a) Explain the concept of quality Assurance and quality control in pharmaceutical industry. Enlist different regulatory authorities for quality management in pharmaceutical industry.
- b) Discuss JCH Guidelines for stability testing.
- c) Explain NABL accreditation procedure.
- d) Write a note on environmental control in pharmaceutical industry.
- e) Explain the importance of qualification and calibration of equipment in pharmaceutical industry.
- f) Explain the quality control tests for plastic containers for parenteral preparations.
- g) Explain the importance and responsibilities of quality assurance unit as per GLP guidelines.
- h) Explain in brief procedure for handling and evaluation of complaints about product quality in pharmaceutical industry.
- i) What is ISO? Elaborate benefits and limitations of ISO.
- j) Discuss in brief good warehousing practices.



Total No. of Questions : 3]

SEAT No. :

P910

[Total No. of Pages : 2

[5854]-701

F.Y. B. Pharmacy

INSTRUMENTAL METHODS OF ANALYSIS

(2018 Pattern) (Semester - VII) (Theory) (BP701T)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Neat diagram must be drawn wherever necessary.

Q1) Attempt the following (Any 5) :

[5 × 3 = 15]

- a) Explain the principle and methodology of thin layer chromatography.
- b) Give a detail account on any two pumps used in HPLC.
- c) Discuss in detail the various types of transitions involved in UV-Visible spectroscopy.
- d) Discuss the principle and applications of ion exchange chromatography.
- e) Explain the types of molecular vibration in IR spectroscopy.
- f) Explain with example the excitation and emission fluorescence spectra.
- g) Describe various development techniques used in paper chromatography.

Q2) Answer the following (Any 2) :

[2 × 10 = 20]

- a) Describe the ideal requirements of detector. Discuss in brief about various detectors used in HPLC.
- b) Draw a neat labeled diagram of flame photometer. Explain the functioning of each part. Write applications of flame photometry.
- c) Describe in detail the theory, instrumentation and applications of HPTLC.
- d) Discuss the phenomenon of fluorescence. Explain in detail the factors affecting fluorescence.

P.T.O.

**Q3)** Attempt the following (any 8) :

**[8 × 5 = 40]**

- a) Write a note on :
  - i) Applications of Gel chromatography.
  - ii) Adsorbents used in TLC.
- b) Give a detail account on detectors used in UV-Visible Spectroscopy.
- c) Discuss the different types of interferences encountered in AAS and the ways to minimize it.
- d) Explain various types of detectors used in GC.
- e) State Beer - Lamberts law. Explain the deviations leading from it.
- f) Discuss rate theory and plate theory in detail.
- g) Give a brief account on filters and monochromators used in UV-Visible spectroscopy.
- h) What is quenching of fluorescence? Explain the different types of quenching.
- i) Write a note on :
  - i) Temperature programming in GC
  - ii) Gradient elution technique
- j) Discuss about various columns used in GC.



Total No. of Questions : 3]

SEAT No. :

P911

[Total No. of Pages : 2

[5854]-702

**Final Year B. Pharmacy**  
**INDUSTRIAL PHARMACY - II**  
**(2018 Pattern) (Semester - VII) (BP702T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer the following (Attempt 5 out of 7) :

**[5 × 3 = 15]**

- a) What is platform technology?
- b) What are the goals of quality management system?
- c) Enlist methods of risk management.
- d) What is performance qualification?
- e) What are the dimensions of quality?
- f) What is vertical technology transfer?
- g) What are the benefits of ISO 14000?

**Q2)** Answer the following (Attempt 2 out of 4) :

**[2 × 10 = 20]**

- a) What is technology transfer? Explain granularity of technology transfer.
- b) Describe documentation required in technology transfer.
- c) Explain the regulatory approval process for New Drug Application.
- d) Explain the elements of ISO 9000 : 2000.

**P.T.O.**

**Q3)** Answer in short (Attempt 8 out of 10) :

**[8 × 5 = 40]**

- a) Describe SUPAC SS level 1 changes in batch size.
- b) What is risk management in technology transfer?
- c) Write a note on technology transfer agencies in India.
- d) Describe impact of change in equipment as per SUPAC guidance.
- e) What is certification process as per ISO 9001?
- f) Explain the organisation & functions of CDSCO.
- g) What is GLP? Discuss the same.
- h) Explain concept of six sigma for quality improvement.
- i) What is clinical research protocol & data presentation.
- j) Write note on phases of clinical trials.





Total No. of Questions :3]

SEAT No. :

**P 912**

**[5854]-703**

[Total No. of Pages : 2

**F.Y. B.Pharmacy**

**PHARMACY PRACTICE**

**(2018 Pattern) (Semester - VII) (BP 703T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 2) *Draw neat and well labeled diagram wherever necessary.*
- 3) *Figures to the right indicates full marks.*

**Q1) Objective type questions (Answer any 5 out of 7) [15]**

- a) Classify hospitals based on type of care provided and give their functions.
- b) Comment on the beneficial drug interactions.
- c) What is satellite pharmacy service? Give its advantages & disadvantages.
- d) What is drug information centre (DIC)? Enlist the objectives of DIC.
- e) Enlist the risks associated with self medication.
- f) Give the composition of pharmacy & therapeutic committee and enlist the primary functions of it.
- g) Explain the role of pharmacist in use of investigational drug in the hospital.

**Q2) Long answers (Answer any 2 out of 4) [20]**

- a) Summarize the risk factors for drug interactions and explain pharmacokinetic type of drug interactions with examples.
- b) Enlist the objectives of drug store and describe the layout, types of material stocked and storage conditions for different materials in drug store.
- c) Describe objectives and stages of patient counselling.
- d) Explain the drug therapy monitoring by clinical pharmacist.

**P.T.O.**

**Q3) Short Answers (Answer any 8 out of 10)**

**[40]**

- a) What is an investigational drug? Explain the procedure for control of investigational drug use in the hospital.
- b) Comment on the clinical significance of hematological parameters.
- c) Define controlled drug and discuss the dispensing of controlled drugs.
- d) Give type of prescriptions and discuss legal requirements and handling of prescription.
- e) Explain the hypersensitivity and carcinogenicity.
- f) Discuss the dispensing of drugs of ambulatory patients.
- g) Explain the basic criteria for sale of over the counter (OTC) medication and give advantages and risk associated with OTC medication.
- h) Comment on the adverse drug reaction monitoring & reporting system in India.
- i) Enlist the objectives of inventory control and discuss techniques used for inventory control.
- j) Explain the role of pharmacist in patient's medication adherence.



Total No. of Questions : 3]

SEAT No. :

[Total No. of Pages : 2

**P913**

**[5854]-704**

**Fourth Year B. Pharmacy**

**NOVEL DRUG DELIVERY SYSTEM**

**(2018 Pattern) (Semester - VII) (Theory) (BP 704T)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer the following (Solve 5 out of 7) :

**[5×3=15]**

- a) What factors affect the designing of modified drug delivery system.
- b) Write a short note on nebulizers.
- c) Explain disadvantages of conventional ocular drug delivery systems.
- d) Describe nanoparticles along with their general properties.
- e) Classify liposomes according to structure.
- f) Explain ideal properties of bioadhesive polymer.
- g) Write note on coacervation methods of microencapsulation.

**Q2)** Answer in detail (Ans. 2 out of 4) :

**[2×10=20]**

- a) Explain in detail components for TDDS patch formulation along with evaluation of TDDS.
- b) Explain in detail formulation methods for nanoparticles along with advantages of nanoparticulate delivery.

**P.T.O.**

- c) Explain the preparation and applications of Monoclonal antibodies.
- d) Discuss in detail types of ocular drug delivery systems.

**Q3)** Answer the following in brief (Answer 8 out of 10) :

**[8×5=40]**

- a) Explain the classification of intrauterine drug delivery system with suitable examples.
- b) Explain permeation enhancers with examples in TDDS.
- c) Explain the different theories of mucoadhesion.
- d) Write a note on evaluation properties of niosomes.
- e) Describe the mechanism of osmotically controlled system for controlled drug delivery of drugs.
- f) Explain Metered Dose Inhaler (MDI).
- g) What are temperature and pH responsive polymers? Explain.
- h) What are ion exchange resins? Give their mechanism.
- i) Explain the different barriers in ocular drug delivery.
- j) Write a short note on biodegradable polymers.



Total No. of Questions : 3]

SEAT No. :

**P914**

[Total No. of Pages : 2

**[5854]-801**

**F.Y. B.Pharmacy**

**BIOSTATISTICS AND RESEARCH METHODOLOGY**

**(2018 Pattern) (Semester - VIII)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer the following. (Any Five)

**[15]**

- a) Discuss in brief about mean as a measure of central tendency.
- b) Enlist steps in writing a research report.
- c) Explain different types of errors in hypothesis testing.
- d) Explain in brief about response surface plot.
- e) Find the range of the following raw data and put it as arrayed data :  
7, 13, 5, 3, 4, 12, 13, 4, 3, 4, 18, 19, 12, 4, 13, 8, 4, 9, 8, 24.
- f) A box contains 5 red, 3 blue and 6 green balls; if one ball is drawn at random from the box what is the probability that the ball is : I. Red and II. Green.
- g) A random sample of 20 tablets from a batch gives a mean active ingredient content 42 mg and standard deviation of 6 mg. Test the hypothesis that the population mean is 44 mg. (Table t value = 2.093).

**Q2)** Answer the following. (Any Two)

**[20]**

- a) Which are the different methods for presentation of data? Describe in detail about graphical presentation of data.
- b) Discuss about designing of clinical trials and phases of clinical trials.
- c) Explain principle and steps involved in experimental design. Write in detail about factorial design.
- d) An injection has been formulated containing sulfamethaxazole and trimethoprim. It is known that the probability of precipitation in the formulation is 1%. Calculate the chance of observing 2, or fewer than 2 vials containing precipitate in a sample of 100 vials.

**P.T.O.**

**Q3)** Answer the following. (Any Eight)

**[40]**

- a) Explain in brief about ANOVA.
- b) What is statistical data? Explain in brief about types of data.
- c) Write a note on Plagiarism.
- d) Define optimization. Add a note on optimization techniques.
- e) Explain the different steps needed to convert a given raw data to grouped data and to form a frequency table.
- f) Define statistics. Write applications of statistics.
- g) Write note on MINITAB®.
- h) Write a note on Wilcoxon Rank Sum Test.
- i) The class marks and their corresponding frequencies are given below:  
Class marks : 23 28 33 38 43 48 53 58  
Frequency : 1 2 5 8 14 6 3 1  
Form a cumulative frequency table from the above data.
- j) Given the two lines of regression as,  $8X - 10Y + 66 = 0$  and  $40X - 18Y - 214 = 0$ . Find average of X & Y and correlation coefficient between X and Y.



Total No. of Questions :3]

SEAT No. :

**P 915**

**[5854]-802**

[Total No. of Pages : 2

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

**SOCIAL AND PREVENTIVE PHARMACY**  
**(2018 Pattern) (Semester-VIII) (Revised)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer any five (5 out of 7)

**[15]**

- a) What is Pulse polio programme.
- b) Explain the causes and treatment of malaria.
- c) What are the objectives of RNTCP.
- d) Describe the toxic effects of tobacco.
- e) What is national urban health mission?
- f) Explain the Importance of personal hygiene.
- g) What is Lymphatic filariasis? Add note on its prevention and treatment.

**Q2)** Answer any Two. (2 out of 4)

**[20]**

- a) Write a note on HIV and AIDS control program.
- b) Explain Integrated Disease Surveillance Programme (IDSP).
- c) Write a note on National Health Programme and National AIDS Control Programme.
- d) Explain the process and indication for evaluation of public health.

**P.T.O.**

**Q3)** Answer any eight. (8 out of 10)

**[40]**

- a) Write a note on relation of nutrition and health.
- b) Write general principles of prevention and control of cholera.
- c) Explain the effects of ebola virus, mode of transmission and prevention.
- d) What is SARS write its symptoms and prevention?
- e) What are the objectives of national family welfare programme?
- f) Explain the objectives and functions of national leprosy programme.
- g) What are the functions of Primary Health Centres?
- h) Objectives and implementation of national tobacco control programme.
- i) What are the community services in urban areas?
- j) What is cancer? Write a note palliative care in cancer.





Total No. of Questions : 3]

SEAT No. :

**P916**

[Total No. of Pages : 2

**[5854]-803**

**Final Year B.Pharmacy**

**PHARMA MARKETING MANAGEMENT**

**(2018 Pattern) (Semester - VIII)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*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.*

**Q1)** Answer all the questions (objectives) (any 5 out of 7) **[5 × 3 = 15]**

- a) Distinguish between marketing & selling.
- b) Discuss the Quantitative aspects of pharmaceutical market.
- c) Write a note on market segmentation.
- d) Discuss the motivation and Prescribing habits of physician.
- e) Discuss the various factors which affects patient's choice regarding Physician.
- f) Define market research & explain its importance in Pharma marketing.
- g) Discuss the importance of Competative analysis in pharma marketing.

**Q2)** Long Answers (any 2 out of 4) **[2 × 10 = 20]**

- a) Discuss in detail Global marketing of pharmaceutical product.
- b) Explain in detail pricing objectives.
- c) Explain Designing of Pharmaceutical marketing chanel.
- d) Discuss the main factors influencing promotion mix.

**P.T.O.**

**Q3) Short Answers (any 8 out of 10)**

**[8 × 5 = 40]**

- a) Write in detail targeting in Pharmaceutical marketing.
- b) Explain in detail with example about size and composition of the Pharma market.
- c) What are Demographic characteristics in customer profile.
- d) Describe types of Conflict and competitions in marketing channel.
- e) Outline sources of market research.
- f) Discuss in detail product life cycle.
- g) Discuss in detail online Promotional techniques for OTC products.
- h) What is detailing explain its purpose.
- i) Write in detail about compensation and future prospects of the professional sales Representative.
- j) Write a note on DPCO (Drug price control order).



Total No. of Questions : 3]

SEAT No. :

P994

[Total No. of Pages : 2

[5854]-804

**Final Year B. Pharm.**

**PHARMACEUTICAL REGULATORY SCIENCE**  
**(2018 Pattern) (Semester - VIII) (BP804ET) Theory**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Answer the following (Solve any 5 out of 7) :

**[5 × 3 = 15]**

- a) Give the stages of drug discovery.
- b) What is NDA, explain in brief.
- c) Write a note on ANDA.
- d) Elaborate on common technical document.
- e) Explain clinical trial protocol.
- f) Give basic terminologies in regulatory concept.
- g) Write a note on orange book.

**Q2)** Answer the following (Any 2 out of 4) :

**[2 × 10 = 20]**

- a) Explain in detail drug development process in preclinical study.
- b) Explain registration process for new drug approval in India.
- c) Explain in detail regulatory authority & agencies in Europe.
- d) Describe in detail procedure for development of protocol.

**P.T.O.**

**Q3)** Answer the following in brief (Answer 8 out of 10) :

**[8 × 5 = 40]**

- a) Explain import & export of pharmaceutical product in detail.
- b) Write a note on drug master file.
- c) Explain clinical trial protocol.
- d) Discuss GCP obligation of investigator & sponsors.
- e) Elaborate on regulations & regulatory concept.
- f) Explain Australian regulatory authority.
- g) Write a note on Federal regulations.
- h) Explain technical documentation for Indian drug.
- i) Describe regulatory authority in Japan.
- j) Write a note on ASEAN (ACTD) research.

**\*\*\***

Total No. of Questions : 3]

SEAT No. :

**P917**

[Total No. of Pages : 2

**[5854]-805**

**Final Year B. Pharmacy**  
**PHARMACOVIGILANCE**  
**(2018 Pattern) (Semester - VIII)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates :*

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

**Q1)** Solve any FIVE :

**[5 × 3 = 15]**

- a) Give examples of ADRs due to genetic defect in distribution.
- b) Write the role and responsibilities of CDSCO?
- c) Define serious adverse event, side effect and adverse event.
- d) Explain the international classification of diseases.
- e) Write a note on cohort study.
- f) HOW will you calculate DDD?
- g) What is periodic safety update reports?

**Q2)** Solve any TWO :

**[2 × 10 = 20]**

- a) Define pharmacovigilance. Discuss in detail reporting and management of ADRs along with causality assessment scales.
- b) Explain CIOMS requirements for ADR reporting.
- c) Discuss in detail the drug information sources and give specialized resources for ADR.
- d) What is the organization and objective of ICH guidelines in Pharmacovigilance? Explain in detail good clinical practices in Pharmacovigilance studies.

**P.T.O.**

**Q3) Solve any EIGHT :**

**[8 × 5 = 40]**

- a) Explain Vaccine safety surveillance.
- b) Discuss the methods of PMS used by pharmaceutical industry.
- c) Write about MedDRA and standardized MedDRA.
- d) Explain PSUR and ICSR.
- e) Write a short note WHO causality scales.
- f) Write a note on Schedule Y.
- g) What is the role of Pharmacist in management of ADRs.
- h) Explain scope of pharmacovigilance and methods of ADR reporting in India.
- i) Explain comparative observational studies.
- j) Write a note on Communication in pharmacovigilance.



Total No. of Questions : 3]

SEAT No. :

P918

[Total No. of Pages : 2

[5854]-806

**Final Year B.Pharmacy**

**QUALITY CONTROL AND STANDARDIZATION OF  
HERBALS (Theory)**

**(2018 Pattern) (Semester - VIII) (BP 806 ET)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates :*

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

**Q1)** Solve the followings (Answer 5 out of 7) :

**[5 × 3 = 15]**

- a) Enlist evaluation types of crude drugs.
- b) Brief about basic tests for medicinal plants.
- c) Who should report and to whom about adverse drug reaction while safety monitoring of herbal medicines as per WHO guidelines.
- d) Brief the parameters of GAP.
- e) Brief 'Safety' in laboratory as per GLP.
- f) Brief licensing under regulatory requirements of herbals in India.
- g) Justify chromatographic technique application for standardization of herbal products.

**Q2)** Solve long answers :

**[2 × 10 = 20]**

- a) Write about WHO guidelines for GACP for medicinal plants.
- b) Elaborate stability testing for shelf life determination of herbal medicines.
- c) Explain schedule T for GMP requirements as per D & C Act.
- d) Elaborate ICH Guidelines for quality control of Herbal drugs.

**P.T.O.**

**Q3)** Solve short answers (Answer 8 out of 10) :

**[8 × 5 = 40]**

- a) Write in detail procedure for export registration of herbals.
- b) Explain harvest & personnel as per GACP guideline of WHO.
- c) Explain role of chemical markers in standardization of herbal products.
- d) Discuss on preparation of documents for new drug application.
- e) Explain D & C Act provision for herbals.
- f) Brief note on various herbal pharmacopoeia.
- g) Brief post harvesting aspects as per GACP guidelines of WHO.
- h) Explain cGMP for quality assurance in herbal drug industry.
- i) Write in detail about GLP in Herbal drug Industry for traditional system of medicine.
- j) Write about research guidelines for evaluating efficacy of herbal medicines.





Total No. of Questions : 8]

SEAT No. :

**P919**

[Total No. of Pages : 2

**[5854]-807**

**Final Year B. Pharmacy**

**COMPUTER AIDED DRUG DESIGN**

**(2018 Pattern) (Semester - VIII) (Theory) (BP807ET)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

*All questions are compulsory.*

**Q1)** Objective type questions (Answer 5 out of 7) :

**[5×3=15]**

- Write a note on Taft steric constant.
- Write a note on Lipinski Rule of Five.
- Compare SAR & QSAR.
- Write a note on cheminformatics in drug discovery process.
- Define bioinformatics. Mention applications of Bioinformatics.
- Discuss the role of molecular & quantum mechanics in drug discovery.
- Applications of QSAR.

**Q2)** Long answer questions (Answer 2 out of 4) :

**[2×10=20]**

- What is QSAR? Explain in detail history & development of QSAR. Explain the Hantzsch analysis & free Wilson analysis & relationship between them.
- What do you mean by Drug discovery & development. Explain various steps & approaches to lead discovery.
- Explain in detail Ligand structure based drug design by taking suitable example.
- What is molecular docking? Enlist various types of molecular docking & explain any one of them. Write a note on concept of virtual screening.

**P.T.O.**

**Q3) Short answer questions (Answer 8 out of 10) :**

**[8×5=40]**

- a) Write a note on molecular mechanics.
- b) Classify the Bioisosterism approach with examples. Discuss bioisosteric replacement strategy with one case study.
- c) Discuss various databases used in drug design & discovery.
- d) Explain in detail quantum mechanics.
- e) Physicochemical Parameters involved in QSAR.
- f) Write a note on databases used in bioinformatics.
- g) Discuss COMFA & CONSIA.
- h) Explain different methods in determination of energy minimization.
- i) Describe theoretical determination of partition coefficient parameter in QSAR.
- j) Pharmacophore based screening.



Total No. of Questions : 3]

SEAT No. :

**P920**

[Total No. of Pages : 2

**[5854] - 808**

**Fourth Year B.Pharmacy**

**CELL AND MOLECULAR BIOLOGY**

**(2018 Pattern) (Semester - VIII) (BP808ET)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates :*

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

**Q1) Attempt Any Five :**

**[15]**

- a) Define molecular biology.
- b) Define mitosis.
- c) Define anabolism.
- d) Define mutation.
- e) Importance of Cell Membrane.
- f) Give significance of protein synthesis.
- g) Draw double helical structure of DNA.

**Q2) Attempt Any Two :**

**[20]**

- a) Describe different steps involved in transcription process.
- b) Describe various signaling pathway.
- c) What are amino acids. Explain their role in protein synthesis.
- d) Describe in detail about MAPK, SiRNA, MicroRNA.

**P.T.O.**

**Q3) Attempt Any Eight :**

**[40]**

- a) Explain the stages in cell cycle.
- b) Explain the transducer mechanism of GPCR.
- c) Describe gene mapping and gene sequencing in detail.
- d) Draw well labeled structure of cell. Enlist functions of cell and its organelles.
- e) Explain the mechanisms of replication.
- f) Explain the mechanism gene expression.
- g) Write a note on the applications of Genomics.
- h) Explain the process of mitosis.
- i) Describe primary, secondary, tertiary structure of proteins.
- j) Explain misregulation of signaling pathway and its role in disease.



Total No. of Questions : 3]

SEAT No. :

[Total No. of Pages : 2

**P921**

**[5854]-809**

**Final Year B. Pharmacy**

**COSMETIC SCIENCE**

**(2018 Pattern) (Semester - VIII) (BP 809ET)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Attempt any five out of seven of the following

**[5×3=15]**

- a) Define SPF. Give Classification of sunscreen.
- b) Give the classification of shampoos used for dandruff.
- c) Explain cosmetic as Quasi drug.
- d) How rheology modifiers can improve the aesthetic value of cosmetics.
- e) Give the difference between humectants and emollients.
- f) Write the evaluation test for tensile strength of hair
- g) Discuss functions of skin.

**Q2)** Answer any two out of four of the following.

**[2×10=20]**

- a) Explain the Bureau of Indian standards and analytical methods for toothpaste.
- b) Define cosmetics & elaborate on the classification of cosmetic and cosmeceutical products.
- c) Discuss the principles and building blocks of hair care products.
- d) Discuss the role of herbs in cosmetics with special emphasis on skin care, oral care & hair care products.

**P.T.O.**

**Q3)** Answer in brief on any eight of the following.

**[8×5=40]**

- a) Discuss in brief formulation of mouthwash
- b) Write a note on acne and measures to control it.
- c) Discuss on bleeding gums and mention suitable therapy.
- d) Discuss the role of surfactants as cosmetic excipients
- e) Discuss formulation aspects of vanishing cream
- f) Discuss the evaluation of sunscreen in brief
- g) Discuss causes and prevention for blemishes and wrinkles.
- h) Write a note on deodorants and antiperspirants.
- i) Discuss in brief role and applications of viscosity modifiers and preservatives as cosmetic ingredients.
- j) What is the reason for sensitive teeth and how cosmeceuticals can help to avoid sensitivity?



Total No. of Questions : 3]

SEAT No. :

**P922**

[Total No. of Pages : 2

**[5854]-810**

**Fourth Year B. Pharmacy**

**EXPERIMENTAL PHARMACOLOGY**

**(2018 Pattern) (Semester - VIII) (BP810 ET)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates:*

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

**Q1)** Objective type questions (Answer any 5 out of 7)

**[15]**

- a) Explain the 3 'R' principles of CPCSEA.
- b) Enlist the preclinical screening methods for anti-inflammatory activity.
- c) List out animal models for sympathomimetics & sympatholytics.
- d) Explain the preclinical evaluation of skeletal muscle relaxants.
- e) Explain the different types of control groups used in design of animal experiments.
- f) What is nootropic activity? Explain the principle of any two models used to determine nootropic activity.
- g) Discuss the principle and use of Actophotometer in experimental pharmacology.

**Q2)** Long Answers (Answer any 2 out of 4)

**[20]**

- a) Discuss CPCSEA guidelines for laboratory animals housing facility.
- b) Discuss preclinical screening methods for analgesic drugs
- c) Enlist the screening methods for anti cancer drugs. Explain any two methods
- d) Discuss production and applications of transgenic animals.

**P.T.O.**

**Q3) Short Answers (Answer any 8 out of 10)**

**[40]**

- a) Discuss characteristics and experimental uses of guinea pig & rabbit
- b) Explain ANOVA and its applications
- c) Explain preclinical evaluation of anti diabetic activity.
- d) Discuss screening of anit psychotics agent in laboratory animals.
- e) Enlist screening models for anti depressant activity. Explain any two models
- f) Explain any two methods for evaluation of anti hypertensive activity
- g) Define bioassay and explain principle and applications of it
- h) Enlist anti asthmatic screening methods. Explain any two methods.
- i) Write a note on preclinical evalution of anti dyslepidemic agents.
- j) Explain the sources and significance of “literature review” in research.





Total No. of Questions : 3]

SEAT No. :

P923

[Total No. of Pages : 2

[5854] - 811

F. Y. B. Pharmacy

**ADVANCED INSTRUMENTATION TECHNIQUES**  
**(2018 Pattern) (Semester - VIII)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates :*

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*
- 3) *Draw well labeled diagrams wherever necessary.*
- 4) *Do not write anything on question paper except seat number.*

**Q1) Answer following questions (Any Five) :**

**[15]**

- a) Write in brief about Time of flight analyzer
- b) Explain NMR spectrum of ethyl alcohol.
- c) Discuss Bragg's equation in brief and state its significance.
- d) How the parameter 'Control of Absorbance' is calibrated in UV spectrophotometer?
- e) Discuss procedures for injection Linearity and detector linearity for calibration of HPLC.
- f) What are applications of Differential Thermal Analysis?
- g) Write in brief about solvents used in NMR spectroscopy.

**Q2) Answer following questions in detail (Any Two) :**

**[20]**

- a) Discuss various factors affecting chemical shift.
- b) Suggest suitable chemical structure for following spectroscopic data :  
Molecular Formula  $C_7H_6O_2$   
JR :  $3200\text{ cm}^{-1}$ ,  $2800\text{ cm}^{-1}$ ,  $1710\text{ cm}^{-1}$   
Proton NMR :  $\delta$  7.2 (m, 5H),  $\delta$  10 (s, 1H),  
Mass (m/z): 122, 105, 77
- c) Explain in detail instrumentation of NMR spectroscopy with labelled diagram.
- d) Discuss rules for predicting prominent peaks in mass spectrum.

*P.T.O.*

**Q3) Write short notes on following (Any Eight) :**

**[40]**

- a) Instrumentation of DTA
- b) GC-MS
- c) Gel Electrophoresis
- d) Calibration of IR Spectrophotometer
- e) Solid Phase Extraction
- f) Calibration of Electronic balance
- g) Powder Crystal Technique
- h) Differential Scanning Calorimetry
- i) Radioimmuno assay
- j) Tandem mass spectrometry

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Total No. of Questions : 3]

SEAT No. :

P924

[Total No. of Pages : 2

[5854]-812A

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

**BP812 ET : DIETARY SUPPLEMENTS &  
NUTRACEUTICALS**

**(2018 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 75*

*Instructions to the candidates :*

- 1) *All questions are compulsory.*
- 2) *Draw neat & labelled diagram wherever necessary.*
- 3) *Figures to the right indicate full marks.*

**Q1)** Objective type Questions (Any 5 out of 7) :

**[5 × 3 = 15]**

- a) What food standards does AGMARK specify?
- b) What are reactive oxygen species? Give examples.
- c) What are complex carbohydrates? Give examples.
- d) Enlist factors that reduce endogenous antioxidants enzymes.
- e) Write health benefits of Xanthophylls.
- f) Define functional foods. Give examples.
- g) List out nutraceuticals for child health.

**Q2)** Long Answers (Any 2 out of 4) :

**[2 × 10 = 20]**

- a) Define functional foods & classify Nutraceuticals. Explain in detail the significance of Nutraceuticals in prevention & management of heart disease & hypertension.
- b) Explain in detail the role of free radicals in diabetes. Comment on the role of  $\alpha$ -Lipoic acid & tocopherol in management of free radicals.
- c) Explain the importance of GMP in Food safety. Add a note on adulteration of foods.
- d) Write a note on Phytochemicals as nutraceuticals.

**P.T.O.**

**Q3) Short answers (Any 8 out of 10) :**

**[8 × 5 = 40]**

- a) Write a note on Flax seeds and its medicinal importance.
- b) Enlist various sea foods. Add a note on medicinal applications of sea foods.
- c) Explain in detail the damaging effect of free radicals on protein.
- d) Role of free radicals in causing diabetes.
- e) Explain the regulatory process of obtaining FDA approval.
- f) Write detailed note on Lycopene & Lutein.
- g) Write a note on storage & environmental factors on the potency of Nutraceuticals.
- h) Write a note on Endogenous antioxidants. Add a note on Vitamin C.
- i) Write a note on various sources of Dietary fibres.
- j) Explain the significance of Carotenoids as nutraceuticals.

