

Total No. of Questions : 3]

SEAT No. :

P925

[Total No. of Pages : 2

[5854]-1001

F.Y. B. Pharmacy

HUMAN ANATOMY and PHYSIOLOGY - I

(2019 Pattern) (Theory) (BP101T) (Semester - I)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

- 1) *Figures to the right indicate full marks.*
- 2) *Draw an appropriate diagram/s wherever necessary.*

SECTION - I

Q1) Attempt any five from the followings.

[5 × 3 = 15]

- a) Explain different types of taste buds.
- b) Give structure and functions of artery.
- c) Explain formation of haemoglobin.
- d) Give composition and functions of blood.
- e) Give types of bones with examples.
- f) Explain cartilage type of connective tissue.
- g) Explain structural organisation of body.

Q2) Attempt any two from the followings.

[2 × 10 = 20]

- a) Explain the mechanism of haemostasis.
- b) Explain origin and functions of cranial nerves.
- c) Explain interior of heart and cardiac cycle.
- d) Explain mechanisms for transport across cell membrane.

P.T.O.

Q3) Attempt any eight from the followings.

[8 × 5 = 40]

- a) Explain types of joints with examples.
- b) Explain electrocardiogram.
- c) Explain structure and functions of spleen.
- d) Explain Renin Angiotensin System.
- e) Explain physiology of hearing.
- f) Differentiate between sympathetic and parasympathetic system.
- g) Explain physiology of muscle contraction.
- h) Explain location and functions of different epithelial tissues.
- i) Explain 'Meiosis'.
- j) Explain different components and feedback mechanisms for homeostasis.



Total No. of Questions : 3]

SEAT No. :

P926

[Total No. of Pages : 2

[5854]-1002

F.Y. B. Pharmacy

PHARMACEUTICAL ANALYSIS - I

(2019 Pattern) (Semester - I) (Theory) (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.*
- 3) *Draw neat labelled diagrams wherever necessary.*

Q1) Answer ANY FIVE objective type questions out of the following : **[5 × 3 = 15]**

- a) Write the applications of Precipitation titrations.
- b) Give the significance of Nernst equation.
- c) How to prepare and standardize of sodium hydroxide solution?
- d) Discuss the principle of Polarography.
- e) Explain methods of minimizing errors.
- f) Write the difference between Iodimetry and Iodometry.
- g) Explain significant figures.

Q2) Answer any TWO questions out of the following : **[2 × 10 = 20]**

- a) Explain the neutralization curves of Strong Acid with Strong Base and Weak Base with Strong Acid.
- b) Discuss the principle and applications of Permanganometry and Dichrometry.
- c) Discuss in detail the electrochemical cell. Explain the construction and working of Standard Hydrogen Electrode and Calomel Electrode.
- d) Explain metal ion indicators, masking and demasking reagents.

P.T.O.

Q3) Answer ANY EIGHT questions out of the following : **[8 × 5 = 40]**

- a) Write a note on Fajan's method.
- b) Explain working of Abbe's refractometer.
- c) Discuss Primary and Secondary standards.
- d) Explain Co-precipitation and post precipitation.
- e) Discuss theories of acid base indicators.
- f) Explain estimation of sodium benzoate using Non aqueous titration.
- g) Write Titrations with Potassium Iodate I.P.
- h) Discuss different types of potentiometric titrations.
- i) Explain estimation of Barium sulphate I.P.
- j) Discuss Molarity, Molality, Normality and Mole fractions along with their formula.



Total No. of Questions : 3]

SEAT No. :

[Total No. of Pages : 2

P927

[5854]-1003

Final Year B. Pharmacy

PHARMACEUTICS - I

(2019 Pattern) (Semester - I) (BP103T)

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 any 5 out of 7.

[15]

- a) List out various roles of pharmacist in health care system.
- b) Define -
 - i) Lozenges
 - ii) Powders
 - iii) Cachets
- c) list out various steps in handling of prescription.
- d) Define posology and give any one formula for dose calculation.
- e) Convert the following degree of proof spirit into real strength (% v/v)
 - i) 75° UP
 - ii) 35.3° OP
- f) Define efflorescent and hygroscopic powders.
- g) How elixir differs from syrups?

P.T.O.

Q2) Long answers questions (Attempt any 2 out of 4)

[20]

- a) Discuss the formulation aspects of suspension.
- b) Define emulsion. Discuss identification tests for emulsion. Add a note on their types.
- c) Write a note on
 - i) Displacement value
 - ii) Cold compression method
- d) Write a note on factor influencing the dermal penetration of drug.

Q3) Short answer questions (Attempt any 8 out of 10)

[40]

- a) What is the need for dosage form? Classify dosage forms on the basis of site of administration.
- b) Define and classify gels.
- c) Write a note on therapeutic incompatibility.
- d) Formulation aspects for
 - i) Throat paint
 - ii) Enemas
- e) Write a note on history of pharmacy profession
- f) Write about evaluation of semisolid dosage forms.
- g) What are the various errors in prescription
- h) How many ml of 60% w/v glucose solution and 10% w/v glucose solution are required to prepare 3000ml of 20% w/v glucose solution.
- i) What are the factors affecting posology?
- j) Write a note on Creams.



Total No. of Questions : 3]

SEAT No. :

P928

[Total No. of Pages : 2

[5854] - 1004
F. Y. B. Pharmacy
BP104T : PHARMACEUTICAL INORGANIC
CHEMISTRY
(2019 Pattern) (Semester - I)

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 whenever necessary.*

Q1) Attempt any five out of seven.

[5 x 3 = 15]

- a) Give various sources of impurities in pharmaceutical substances.
- b) Classify buffers. Give examples of buffers in pharmaceutical systems.
- c) Give assay for Ammonium chloride.
- d) What are dental products?
- e) Give importance of antacid combinations. Give the preparation, identification tests and medicinal uses of Aluminum hydroxide gel.
- f) What are Expectorants?
- g) Define astringents with examples.

Q2) Attempt any two out of four.

[2 x 10 = 20]

- a) What are limit test? Explain limit test for Lead and Arsenic.
- b) Define antimicrobial agents. Give their classification and mechanism. Add a note on Hydrogen peroxide.
- c) Give the preparation, identification tests, assay and medicinal uses of
 - i) Sodium chloride
 - ii) Sodium bicarbonate
- d) What is radioactivity? Explain methods for the measurement of radioactivity. Give storage and handling of radiopharmaceuticals.

P.T.O.

Q3) Attempt any eight out of ten.

[8 x 5 = 40]

- a) Give the preparation, identification tests, assay and medicinal uses of Copper sulphate.
- b) Write history of Pharmacopoeia. Add a note on Indian Pharmacopoeia.
- c) Give calculations and methods of adjusting isotonicity.
- d) Give functions of major extracellular cations and anions.
- e) Write a note on Haematinics.
- f) Pharmaceutical applications of radioactive substances. Add a note on Sodium iodide.
- g) Give various official waters. Add a note on official control tests for water.
- h) Give modified limit test for chloride and sulphate.
- i) Write a note on poison and Antidote.
- j) Write in detail about Cathartics.



Total No. of Questions : 3]

SEAT No. :

P929

[Total No. of Pages : 2

[5854] - 2001

First Year B.Pharmacy

HUMAN ANATOMY AND PHYSIOLOGY - II

(2019 Pattern) (Semester - II) (BP201T)

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 the following (Any 5) :

[15]

- a) Define the terms :
 - i) Gastritis
 - ii) Peptic ulcers
 - iii) Cirrhosis
- b) Describe meninges of the CNS.
- c) Explain compositions and functions of pancreatic juice.
- d) Define the terms : tidal volume, inspiratory reserve volume and vital capacity.
- e) Draw neat labeled diagram of cross section of kidney. Enlist various functions of kidney.
- f) Describe cells of anterior pituitary with their functions.
- g) Explain the structure of chromosome.

Q2) Answer the following (Any 2) :

[20]

- a) Draw neat labeled diagram of brain. Describe in detail anatomy and functional areas of cerebrum.
- b) Explain the process of absorption, chemical and mechanical digestion in small intestine.
- c) Draw a neat labeled diagram of respiratory system. Explain mechanism of breathing and exchange of gases at lung and tissue level.
- d) Discuss the structure of nephron. Explain in detail physiology of urine formation.

P.T.O.

Q3) Answer the following (Any 8)

[40]

- a) Explain histology and functions of liver.
- b) Explain regions and functions of hypothalamus.
- c) Elaborate basal metabolic rate and its significance.
- d) Discuss structure and functions of stomach.
- e) Classify neurons and explain properties of neurons.
- f) Explain synthesis, storage, release and functions of thyroid hormones.
- g) Enlist the organs of male reproductive system.

Write a note on Spermatogenesis.

- h) Discuss in detail physiology of menstruation.
- i) Define and classify hormones. Write in detail about mechanism of hormone action.
- j) Discuss the process of protein synthesis in detail.



Total No. of Questions : 3]

SEAT No. :

P930

[Total No. of Pages : 2

[5854]-2002

First Year B.Pharmacy

PHARMACEUTICAL ORGANIC CHEMISTRY - I

(2019 Pattern) (Semester - II) (BP202T)

Time : 3 Hours]

[Max. Marks : 75

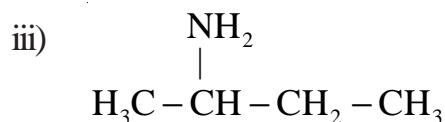
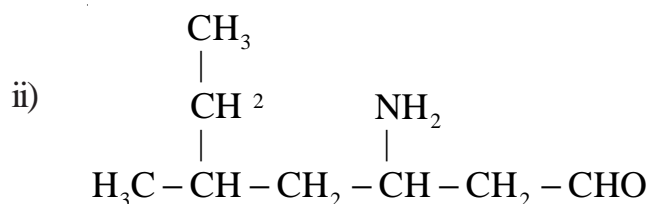
Instructions to the candidates:

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

Q1) Solve any five of the following :

[5×3=15]

- a) Define covalent bond and differentiate between sigma and pi bond.
- b) Draw structures of compounds from following IUPAC names.
 - i) 4-Methyl-3, 3-diethyl-5-isopropyloctane
 - ii) 4-Bromo-5-methyl-2-octyne
 - iii) 2-Ethoxy-5-methylhexane
- c) Write IUPAC names for following structures.



- d) Explain inductive effect with example.
- e) Explain concept of tautomerism with examples.
- f) Give structure and uses of
 - i) Benzyl alcohol
 - ii) Ethyl alcohol
- g) Explain the order of basicity for Primary, Secondary and Tertiary amines.

P.T.O.

- Q2)** Solve any two of the following : **[2×10=20]**
- a) Explain E1 elimination reaction with mechanism, kinetics and factors affecting. Explain Saytzeff orientation.
 - b) What are carbonyl compounds? Write any three methods of preparation and any three nucleophilic addition reactions of aldehydes.
 - c) Explain S_N1 and S_N2 reactions. Discuss the factors affecting S_N1 and S_N2 reactions.
 - d) Classify organic compounds on the basis of elemental composition with suitable examples. Give the qualitative tests for alcohols, aldehydes and carboxylic acids.
- Q3)** Solve any Eight of the following. **[8×5=40]**
- a) Explain any three types of structural isomerisms in organic compounds with one example each.
 - b) What are conjugated dienes? Explain 1,4- electrophilic addition reactions.
 - c) Draw structure and give uses of following carboxylic acids.
 - i) Acetic acid
 - ii) Tartaric acid
 - iii) Acetyl salicylic acid
 - d) Write the reaction mechanism for Aldol condensation and Cannizzaro reaction.
 - e) Write the effect of substituent on the basicity of aliphatic amines. Draw structure and give uses of ethylenediamine.
 - f) Draw structure and give uses of following.
 - i) Chloral hydrate
 - ii) Vanillin
 - iii) Cinnamaldehyde
 - g) Draw structure and give uses of following.
 - i) Trichloroethylene
 - ii) Dichloromethane
 - iii) Iodoform
 - h) Explain electrophilic addition reactions of alkenes and Markownikoff's orientations.
Define following terms.
 - i) Resonance
 - ii) Steric effect
 - iii) Electromeric effect
 - iv) Mesomeric effect
 - v) Hyperconjugation.
 - j) Define hybridization and explain its types.



Total No. of Questions : 3]

SEAT No. :

[Total No. of Pages : 2

P931

[5854]-2003

First Year B. Pharmacy

BIOCHEMISTRY

(2019 Pattern) (Semester - II) (BP203 T)

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 the following (any 5 out of 7) (3 mark each)

[15]

- a) Define and classify amino acid based on their structure.
- b) Give energetic involved in Krebs cycle.
- c) Differentiate between oxidative phosphorylation and substrate phosphorylation.
- d) Explain Fatty liver
- e) Describe biosynthesis of catecholamines.
- f) Define glucose. Give biological role of glucose
- g) Define lipid. Give biological functions of lipids.

Q2) Long Answer (any 2 out of 3) (10 marks each)

[20]

- a) Explain HMP pathway and give its significance.
- b) Explain beta oxidation of fatty acid.
- c) Explain process of translation in detail.
- d) Describe glycogen metabolism in detail. Add a note on GSDs

P.T.O.

Q3) Short Answer (any 8 out of 10) (5 marks each)

[40]

- a) Define and classify enzymes. Add a note on coenzymes.
- b) Explain ketogenesis and its utilization.
- c) Write a note on hormonal regulation of glucose and diabetes mellitus.
- d) Explain concept of free energy.
- e) Describe glycolysis with its energetic.
- f) Explain urea cycle in detail.
- g) Explain enzyme inhibition
- h) Write a note on structure of DNA
- i) Explain biosynthesis of purines.
- j) Give therapeutic and diagnostic applications of enzymes.



Total No. of Questions : 3]

SEAT No. :

P932

[Total No. of Pages : 2

[5854] - 2004
F. Y. B. Pharmacy (Semester - II)
204: PATHOPHYSIOLOGY
(2019 Pattern)

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 side indicate full marks.*

Q1) Answer the following. (Any 5 out of 7) :

[5 × 3 = 15]

- a) Define anaemia and enlist its types.
- b) Explain etiology of polycystic ovarian syndrome.
- c) Describe the factor affecting wound healing.
- d) Give etiology of meningitis.
- e) Discuss about mitochondrial damage.
- f) Define the following.
 - i) Alkalosis
 - ii) Acidosis
 - iii) Apoptosis
- g) Explain the etiology of tuberculosis.

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

[2 × 10 = 20]

- a) Discuss pathophysiology and clinical manifestations of diabetes mellitus.
- b) Enlist ischemic heart diseases. Explain in detail pathophysiology of angina.
- c) Define and classify hepatitis. Discuss in detail pathophysiology of hepatitis B.
- d) Outline the types and explain in detail pathophysiology of cancer.

P.T.O.

Q3) Short Answer (Any 8 out of 10) :

[8 × 5 = 40]

- a) Explain the mechanism of inflammation.
- b) Write a note on reversible cell injury.
- c) Discuss secondary hypertension in detail.
- d) Explain etiology and pathogenesis of chronic obstructive airways disease.
- e) Discuss pathophysiology of urinary tract infection.
- f) Explain pathogenesis of malaria in detail.
- g) Describe the etiology and pathogenesis of sickle cell anaemia.
- h) Define & explain pathophysiology of schizophrenia.
- i) Explain its etiology and pathogenesis of amenorrhea.
- j) Enlist sexually transmitted disorders and discuss in detail pathophysiology of AIDS.



Total No. of Questions : 3]

SEAT No. :

P933

[5854]-3001

[Total No. of Pages : 2

Second Year B. Pharmacy

PHARMACEUTICAL ORGANIC CHEMISTRY - II

(2019 Pattern) (Semester - III)(BP301T) (Theory)

Time : 3 Hours]

[Max. Marks : 75

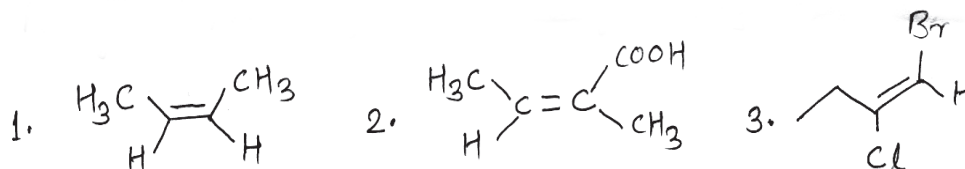
Instructions to the candidates:

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

Q1) Answer any 05 (03 marks each).

[15]

- a) Explain the acidity of phenols.
- b) Explain the preparation of diazonium salt.
- c) How will you distinguish primary, secondary and tertiary amine by simple chemical tests?
- d) Comment on nomenclature of optical isomers.
- e) Assign E/Z configuration to following



- f) Explain hydrolysis of fats and oils.
- g) Write the chemical reactions of cyclobutane.

Q2) Answer any two (10 marks each).

[20]

- a) What are aromatic electrophilic substitution reactions? Write mechanism of nitration of benzene.
- b) Classify structural isomers with examples. Explain cis/trans isomers with examples.

P.T.O.

- c) Write general methods of preparation (any 05) and reactions of cyclopropane.
- d) Explain the directing effects of following functional groups towards electrophilic substitution on benzene.
- i) - OH
 - ii) - NO₂

Q3) Answer any 08 (05 marks each).

[40]

- a) Write a note on racemic resolution of racemic mixtures.
- b) Discuss mechanism of nitration of benzene. Explain role of conc. H₂SO₄ in nitrating mixture.
- c) Elaborate limitations of Baeyer's strain theory.
- d) Write a note on basicity of amines.
- e) Explain Huckel's rule for aromaticity with suitable example.
- f) Explain saponification and rancidity of oils.
- g) Define Diastereomers with suitable examples.
- h) Write a note on Friedel Crafts Alkylation.
- i) Write in brief about geometrical isomerism.
- j) Give an account of synthesis and uses of aromatic diazonium salts.



Total No. of Questions : 3]

SEAT No. :

P934

[Total No. of Pages : 2

[5854]-3002

S.Y. B. Pharmacy

PHYSICAL PHARMACEUTICS - I

(2019 Pattern) (Semester - III) (BP302T)

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) 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 mechanism of detergency.
- d) What are optically active substances?
- e) Classify complexes.
- f) What do you understand by buffer capacity?
- g) Explain dipole-dipole interactions.

OR

Q2) Attempt any two:

[2×10=20]

- a) Elaborate Raoult's law and explain its deviations.
- b) Explain Nernst's distribution law and significance of partition coefficient.
- c) Classify surfactants. Give HLB scale and write a note on micellar solubilisation.
- d) Enlist methods of analysis of complexes. Explain any one method. Enumerate applications of complexation.

P.T.O.

Q3) Attempt any eight :

[8×5=40]

- a) Explain two component system with phase diagram.
- b) Write a note on polymorphism.
- c) Write a note on dissociation constants and its applications.
- d) Explain different methods of pH determination.
- e) Explain various types of isotherms.
- f) Explain principle of liquefied propellants in aerosols.
- g) Enlist factors affecting solubility of gases in liquids.
- h) Write a note on Gibb's phase rule.
- i) Elaborate on colligative properties.
- j) Give significance of biological buffers.



Total No. of Questions : 3]

SEAT No. :

P935

[Total No. of Pages : 2

[5854]-3003

S.Y.B. Pharmacy

PHARAMACEUTICAL MICROBIOLOGY

(2019 Pattern) (BP 303 T) (Semester - III)

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) Attempt any 5 out of 7.

[5 × 3 = 15]

- a) Draw a neat & labelled diagram of HIV.
- b) Differentiate between pilli & Flagella.
- c) Define & give examples of prebiotics.
- d) Define D value & give its significance.
- e) Enlist different types of spoilage.
- f) Discuss general procedure to carry out all culture.
- g) How will you assess a new antibiotic?

Q2) Attempt any 2 out of 4.

[2 × 10 = 20]

- a) Define TVC. Discuss different methods of cell enumeration.
- b) Define culture media & explain different types of culture media.
- c) Define sterilization. Enlist different methods used for sterilization. Explain moist heat sterilization in detail.
- d) Define microbial assays. Discuss methods used for microbial assays.

P.T.O.

Q3) Write a note on (8 out of 10)

[5 × 8 = 40]

- a) Multiplication of human virus
- b) Applications of Microbiology.
- c) Growth curve of bacteria.
- d) Classification of disinfectants.
- e) Sources of contamination in aseptic area.
- f) Sterility testing of WFI.
- g) Challenge test.
- h) Rideal walker coefficient.
- i) Culture media
- j) Bacterial reproduction.



Total No. of Questions : 3]

SEAT No. :

P936

[Total No. of Pages : 2

[5854]-3004

S.Y.B. Pharmacy

PHARMACEUTICAL ENGINEERING

(2019 Pattern) (Semester - III) (BP304T)

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 the following questions any five.

[15]

- a) With suitable examples explain : Filter Media.
- b) Name the principle on which following size reduction equipment works :
 - i) Hammer mill
 - ii) Ball Mill
 - iii) Fluid Energy mill
 - iv) Edge runner mill
 - v) End runner mill
 - vi) Rotary cutter mill
- c) Give factors influencing selection of materials for the construction of plant.
- d) What are the advantage and disadvantages in using climbing Film evaporator?
- e) Differentiate between solid mixing and liquid mixing.
- f) How will you prepare water for Injection by distillation?
- g) Draw neat and labelled diagrams for ball mill along with modes of rolling balls in the ball mill operations.

P.T.O.

Q2) Attempt any two from the following questions. **[2 × 10 = 20]**

- a) Define corrosion. What are its different types? With proper explanation discuss methods to combat (Prevent) it.
- b) Define drying. Discuss the theory of drying with respect to rate relationship.
- c) What is size reduction? Explain with suitable examples factors affecting size reduction? Add a note on : Hammer Mill.
- d) Define filtration. List the factors influencing the rate of filtration. Explain the theories behind filtration process.

Q3) Attempt any eight of the following questions. **[40]**

- a) Explain the principle and advantages of orifice meter.
- b) Describe the principle, construction and working of fluid energy mill.
- c) Explain the official standards of powders, Write a note on sieving.
- d) Explain principle, construction, working & uses of multiple effect evaporators.
- e) Write a note on steam distillation.
- f) Explain construction and operational details of freeze dryer.
- g) With the help of diagram explain principle, construction, working of double cone blender.
- h) Explain principle, construction, working of rotary drum filter.
- i) Explain Principle, construction, working of non-perforated basket centrifuge.
- j) Write about Inorganic and organic nonmetals as material of plant construction.



Total No. of Questions : 3]

SEAT No. :

P937

[Total No. of Pages : 2

[5854]-4001

S.Y.B. Pharmacy

PHARMACEUTICAL ORGANIC CHEMISTRY - III

(2019 Pattern) (Semester - IV) (BP401T)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

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

Q1) Objective Type Questions Any 5 out of 7 :

[5 × 3 = 15]

- a) Chair conformation of cyclohexane is more stable than boat conformation. Why?
- b) Give any three reactions of thiophene.
- c) Draw the following heterocycles with numbering.
 - i) Pyrimidine
 - ii) Oxazole
 - iii) Benzimidazole
- d) Write Synthesis of Furan.
- e) Discuss principal behind oppenauer-oxidation.
- f) Give any three reactions of quinoline.
- g) Describe Hansch synthesis of pyridine with Mechanism.

Q2) Long Answer Any 2 out of 4 :

[2 × 10 = 20]

- a) What is meant by racemic modification. Explain various methods of resolution of racemic mixture.
- b) Give methods of synthesis & reactions of pyrrole.
- c) Discuss reaction, mechanism & applications of Benzilic acid rearrangement & Pinacol-Pinacolone rearrangement reaction.
- d) Elaborate method of synthesis, reactions & medicinal uses of Imidazole.

P.T.O.

Q3) Short Answer Any 8 out of 10 :

[8 × 5 = 40]

- a) Write a note on Atropisomerism.
- b) What are stereospecific & stereo selective reaction.
- c) Comment on conformational isomerism in n-butane.
- d) Asymmetric synthesis.
- e) Discuss mechanism involved in Claisen-Schmidt condensation.
- f) Explain the mechanism reaction conditions & industrial applications of Fischer indole synthesis.
- g) Outline two methods of synthesis & chemical reactions of Thiazole.
- h) Discuss synthesis & medicinal uses of Purine.
- i) What is Clemmensen reduction? Give its application.
- j) Explain in detail Birch reduction.



Total No. of Questions : 3]

SEAT No. :

P938

[Total No. of Pages : 2

[5854]-4002

S.Y. B. Pharmacy

MEDICINAL CHEMISTRY - I

(2019 Pattern) (Theory) (Semester - IV) (BP402T)

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 questions out of seven questions. **[5 × 3 = 15]**

- a) Explain in brief importance of optical isomerism in relation to biological action.
- b) Discuss with examples significance of Hydrogen bonding in relation to drug receptor interaction.
- c) Outline the synthesis of salbutamol.
- d) Explain the MOA and synthesis of carbamazepine.
- e) Discuss MOA and SAR of irreversible cholinesterase inhibitors.
- f) Draw structure and outline the synthesis of Fentanyl citrate.
- g) Discuss alpha adrenergic antagonists with examples.

Q2) Answer any two questions out of four questions. **[2 × 10 = 20]**

- a) Classify adrenergic receptors with their distribution. Classify sympathomimetic agents. Explain SAR of direct acting sympathomimetic with therapeutic uses.
- b) Define psychoses. Classify antipsychotic agents. Elaborate in detail phenothiazine derivatives as antipsychotics.
- c) Classify muscarinic antagonists with examples. Discuss the SAR of muscarinic antagonists with their therapeutic uses.
- d) Classify anti-inflammatory drugs with examples. Explain SAR and MOA of aryl propionic acid derivatives. Outline synthesis of Ibuprofen.

P.T.O.

Q3) Answer any eight questions out of ten questions.

[8 × 5 = 40]

- a) Write a note on Bioisosterism.
- b) Discuss in detail phase I metabolism reactions.
- c) Discuss SAR and MOA of Benzodiazepines.
- d) Explain with examples SAR of Morphine analogues and their uses.
- e) Write a note on Beta blockers with examples.
- f) Explain in detail chemistry and MOA of reversible cholinesterase inhibitors.
- g) Write a note on General anaesthetics.
- h) Discuss the SAR and MOA Narcotic antagonists.
- i) Elaborate on chemistry of Acetylcholine and discuss the parasympathomimetic drugs with examples.
- j) Discuss SAR and MOA of hydantoins and succinimides as anticonvulsant derivatives.



Total No. of Questions : 3]

SEAT No. :

[Total No. of Pages : 2

P939

[5854]-4003

S.Y. B. Pharmacy

PHYSICAL PHARMACEUTICS-II

(2019 Pattern) (Semester - IV) (BP403T)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

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

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

[5×3=15]

- a) Write about the Hofmeister series.
- b) Differentiate dilantant how and negative thixotropy.
- c) Write various types of equivalent spherical diameter.
- d) Write applications of chemical kinetics.
- e) Write the differance between flocculated and de hocculated suspension.
- f) which order of reaction does not obey the reaction rate law and way?
- g) Differentiate plastic and elastic deformation.

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

[2×10=20]

- a) Correlate DLVO theory with the stability of colloidul dispersion.
- b) Write an integrated rate law equation of zero order and first order reactions.
- c) Explain methods used for the determination of viscosity.
- d) Explain in detail the formulation of suspension.

P.T.O.

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

[8×5=40]

- a) Kinetic properties of colloids.
- b) Flow properties of the powder.
- c) Chemical degradation.
- d) Coulter counter method
- e) Van't Hoff's differential method.
- f) Fisher sub-sieve size instrument.
- g) Newtonian law.
- h) HLB of surfactant.
- i) True density of the powder.
- j) Electric Double layer.



Total No. of Questions : 3]

SEAT No. :

P995

[Total No. of Pages : 2

[5854]-4004

S.Y. B. Pharmacy

BP404 T : PHARMACOLOGY - I

(2019 Pattern) (Credit System) (Semester - IV)

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) Objectives type Questions (Answer 5 out of 7)

[3×5=15]

- a) What are CNS stimulants? Write their examples and uses.
- b) Define and classify drug antagonism with example.
- c) Define Tachyphylaxis and give two examples.
- d) Define hypnotics and give two examples.
- e) Define pharmacovigilance.
- f) Define and Classify Drug Interactions.
- g) Define drug dependence with example.

Q2) Long answers (Any 2 out of 4)

[2×10=20]

- a) What is drug absorption? Describe various mechanisms of drug absorption and explain factors affecting absorption.
- b) Define and Classify sedatives and Hypnotics with examples and write Pharmacological effects and uses of them.
- c) Define and Classify Clinical Trials with details of design and data collected. Add a note on Pharmacovigilance.
- d) Define & classify parasympathomimetic agents with suitable example. Explain the biosynthesis, storage, release and metabolism of acetylcholine.

P.T.O.

Q3) Short answer (Any 8 out of 10)

[8×5=40]

- a) Classify antiepileptic drugs. Describe the mechanism of action, therapeutic uses and adverse effects of valproic acid.
- b) Define and classify antipsychotic drugs. Write uses, MOA and ADR of Chlorpromazine.
- c) Define and classify general Anesthetics and write a note on stages of anesthesia.
- d) Enumerate opioid analgesics. Describe the therapeutic uses and adverse effects of morphine.
- e) Explain pharmacokinetic terms Bioavailability and Half-life in detail.
- f) Classify various drugs used for the treatment of Parkinson's disease. Explain why levodopa is combined with carbidopa.
- g) Define drug distribution, write factors affecting it and add a note on volume of distribution.
- h) Classify various beta blockers. Describe clinical uses of beta blockers.
- i) What is rational drug therapy? Which important points are considered before beginning of any drug therapy?
- j) Define & classify drug interaction. Explain drug receptor interaction.



Total No. of Questions :3]

SEAT No. :

P 940

[5854]-4005

[Total No. of Pages : 2

S.Y. B.Pharmacy

**BP 405 T : PHARMACOGNOSY AND PHYTOCHEMISTRY - I
(2019 Pattern) (Semester - IV)**

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

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

Q1) Answer all the questions (Any 5 out of 7)

[5×3=15]

- a) What are edible vaccines.
- b) Write different chem. tests for Castor oil.
- c) Add a note on marine anticancer drugs.
- d) Give Bio source and chemical tests for bromelain.
- e) Define and classify different types of stomata.
- f) Add a note on Chaulmoogra oil and wool fat.
- g) Define Acid value and saponification value.

Q2) Long answers (any 2 out of 4)

[2×10=20]

- a) Define pharmacognosy. Explain in detail history, scope and development of pharmacognosy.
- b) What is Adulteration? Explain types of adulteration and tests for detection of Adulteration.
- c) Classify drugs obtained from marine sources with example and their Medicinal Applications.
- d) Explain in detail polyploidy, mutation and Hybridization with their applications in plant development.

P.T.O.

Q3) Short Answer (any 8 out of 10)

[8×5=40]

- a) Define and classify carbohydrates with example.
- b) Write a note on conservation of medicinal plants.
- c) Define and classify enzymes write a note on Gelatin.
- d) Explain in detail polyploidy and mutation technique of medicinal plants.
- e) Classify various marine drug and explain antineoplastic drugs from marine source.
- f) Explain in detail foaming index.
- g) Enlist plant hormones with their applications.
- h) Comment on general nutrition requirement of plant tissue culture.
- i) Add a note on flavonoids.
- j) Explain chem. test for cardiac glycosides and Anthraquinone glycosides.



Total No. of Questions : 3]

SEAT No. :

P941

[Total No. of Pages : 2

[5854]-5001

T.Y. B. Pharmacy

MEDICINAL CHEMISTRY - II

(2019 Pattern) (Semester - V) (Theory) (BP 501T)

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) Write mechanism of action & medicinal applications of Nicardipine.
- b) Write mechanism of action & medicinal applications of diphenhydramine.
- c) Write a note on loop diuretics.
- d) Discuss carbonic anhydrase inhibitors.
- e) Write a note on anti-coagulants.
- f) Explain in detail oral contraceptives.
- g) Discuss the drugs used in congestive heart failure.

Q2) Attempt the following (Any two) :

[2 × 10 = 20]

- a) Classify oral hypoglycemic agents with suitable examples. Discuss in detail on biguanides & sulphonylureas.
- b) Classify antihypertensive agents with suitable examples. Discuss in detail ACE inhibitors.
- c) What is angina pectoris? Classify antianginal agents with suitable examples, write MOA & medicinal applications of drugs belonging to class vasodialators.
- d) Write biosynthesis of histamine. Classify H₁ antihistaminic agents with suitable examples, write SAR of H₁ Antagonists.

P.T.O.

Q3) Attempt the following (Any eight) :

[8 × 5 = 40]

- a) Write medicinal applications of prostaglandins & leucotriene inhibitors.
- b) Write mechanism of action & medicinal applications of Ethacrynic acid & chlorothiazide.
- c) Outline the synthetic scheme of
 - i) Diphenhydramine
 - ii) Ranitidine
- d) Draw structures, write mechanism of action & medicinal applications of H₂ antagonists.
- e) Discuss anti-arrhythmic agents with suitable examples.
- f) Classify local anesthetics with suitable examples.
- g) Discuss in detail thyroid & antithyroid drugs.
- h) Explain chemistry, nomenclature & stereochemistry of steroids.
- i) Elaborate corticosteroids in detail.
- j) Classify antihyperlipidemic agents with suitable examples.



Total No. of Questions : 3]

SEAT No. :

P942

[Total No. of Pages : 2

[5854]-5002

T.Y. B. Pharmacy
INDUSTRIAL PHARMACY - I
(2019 Pattern) (Semester - V)

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 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 parenteral manufacturing facilities Add note on HVAC system.
- c) Give advantages of parenterals, Discuss in detail official pharmacopoeial evaluation parameters of parenterals.
- 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 gelatin capsules.
- d) Explain weight variation test for capsules as per I.P.
- e) What is HLB? Explain its applications in formulation of biphasic liquid orals.
- f) Define and classify ophthalmic products.
- g) Discuss formulation of soft gelatin capsules.
- h) Discuss evaluation of liquid orals.
- i) Write a note on sunscreen oral SPF.
- j) Explain in brief tonicity adjustments in parenterals.

P.T.O.

Q3) Write a note on (Any 5) :

[15]

- a) Glass as packaging material.
- b) Component of aerosol system.
- c) Quality control tests of aerosols.
- d) IPQC test of capsules as per I.P.
- e) Propellants used in formulation of aerosols.
- f) Fluidized bed coating used in tablet coating.
- g) Stability of Suspension.



Total No. of Questions :3]

SEAT No. :

P 943

[5854]-5003

[Total No. of Pages : 2

T.Y. B.Pharmacy

PHARMACOLOGY - II

(2019 Pattern) (Semester - V) (Theory) (BP 503T)

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 right indicate full marks.*

Q1) Attempt any five of the following.

[15]

- a) Write the advantages of oral hypoglycaemic agent.
- b) Give location and functions of histamine receptor.
- c) Define and classify tocolytics.
- d) Write biosynthesis of prostaglandins.
- e) Comment the role of HMG-CoA reductase inhibitors in the treatment of hyperlipidemia.
- f) Enlist mechanism of actions of antigout drugs.
- g) What are the adverse effects of NSAIDS?

Q2) Attempt any two of the following.

[20]

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

P.T.O.

Q3) Attempt any eight of the following.

[40]

- a) Describe biosynthesis, storage, release and action of thyroid hormone?
- b) Explain the calcium homeostasis.
- c) Add note on bioassay of oxytocin.
- d) Describe physiological effect of glucagon.
- e) Write a note on oral contraceptive pills.
- f) Write mechanism of actions of acetazolamide and spironolactone.
- g) Justify use of calcium channel blockers for any two cardiovascular disease.
- h) Explain pharmacological actions of nitrates?
- i) "Sodium channel blockers are used for treatment of cardiac arrhythmias"
write true or false and Justify.
- j) Write a note on platelet - activating factors?



Total No. of Questions : 3]

SEAT No. :

P944

[Total No. of Pages : 2

[5854]-5004

Third Year B. Pharmacy

PHARMACOGNOSY AND PHYTOCHEMISTRY - II

(2019 Pattern) (Semester - V) (Theory) (BP 504T)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

- 1) *All the 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) Define radioisotopes and give their uses in biogenetic studies.
- b) Name two unorganized drugs with their botanical source and uses.
- c) Give the source and uses of eugenol containing crude drug.
- d) Identification test for Aloes.
- e) Write source and uses of Podophyllotoxin.
- f) Utilization of Vinca alkaloids.
- g) Give the adulterants of Clove bud.

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

[2×10=20]

- a) Define Alkaloids. Explain Biological source, classification, chemistry and medicinal uses of Belladonna and Opium.
- b) Explain Biological source, classification, chemistry and medicinal uses of Volatile oils.

P.T.O.

- c) Describe industrial production and estimation of Diosgenin and sennoside.
- d) What is Microwave assisted extraction. Describe its process, applications, advantages and disadvantages.

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

[8×5=40]

- a) Write a note on tracer technique and its significances.
- b) Describe the microscopy of Clove with a neat labelled diagram.
- c) Adulterants of Senna and Digitalis.
- d) Write the isolation and identification of Quinine.
- e) Describe the isolation and identification of Citral.
- f) Write identification test and estimation of Digoxin.
- g) Discuss the industrial production and estimation of forskolin.
- 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. :

[Total No. of Pages : 2

P945

[5854]-5005

Third Year B. Pharmacy

PHARMACEUTICAL JURISPRUDENCE

(2019 Pattern) (Semester - V) (Theory) (BP505 T)

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 questions (Objective Answer 5 out of 7) :

[5×3=15]

- a) What are Geographical indications?
- b) What are misbranded drugs?
- c) What are schedule N and O?
- d) According to Medical Termination of pregnancy Act. 1971 which places are approved for termination of pregnancy and process for approval of such places.
- e) What are coca derivatives, opium derivatives and opium poppy?
- f) What are the functions of Pharmacy Council of India (PCI).
- g) What is process patent?

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

[2×10=20]

- a) Explain different forms of IPR.
- b) Discuss in detail about constitution and working of state and joint state pharmacy council.

P.T.O.

- c) Write in detail procedure of inspections of drugs and formulations and qualification and responsibilities of drug inspector as per pharmacy Act.
- d) What are the objectives of DPCO, 1995. Explain in detail prices of bulk drugs and retail price of formulation.

Q3) Short Answers (Answer 8 out of 10) :

[8×5=40]

- a) Explain “Education Regulation” under pharmacy Act, 1948.
- b) Procedure for taking samples of Drugs & Cosmetics by Drug inspector.
- c) Controlled operations under narcotic drugs & psychotropic substances act.
- d) Animal Welfare Board of India. Offences and penalties under prevention of cruelty to animals act, 1950.
- e) Explain Bonded Manufactory.
- f) Schedule M.
- g) Adulterated drugs.
- h) Drug Enquiry Committee.
- i) Pharmaceutical code of ethics in relation to Job and Trade.
- j) Procedure for obtaining license to manufacture medicinal & toilet preparations containing alcohol.



Total No. of Questions : 3]

SEAT No. :

P946

[Total No. of Pages : 2

[5854]-6001

T.Y. B.Pharmacy

MEDICINAL CHEMISTRY - III (Theory)

(2019 Pattern) (Semester - VI)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

- 1) *All questions are compulsory. Internal choices are given.*
- 2) *Figure 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.
- b) Which species of plasmodium can cause malaria to human.
- c) Define and classify sulphonamides.
- d) Define and classify antimalarial agents.
- e) Define and classify antibiotics.
- f) Draw the structures of penam, cepham and beta lactam ring.
- g) Multiple choice questions :
 - i) Amodiaquine is a derivative of ?
 - 1) 3-amino quinoline
 - 2) 4-amino quinoline
 - 3) 2-amino quinoline
 - 4) 5-amino quinoline
 - ii) Which is the molecular target for the vinca alkaloids as anticancer agents?
 - 1) Tyrosine kinase
 - 2) DNA
 - 3) Ribosomes
 - 4) Tubulin
 - iii) Streptomycin is example of class _____.
 - 1) Peptide antibiotics
 - 2) Macrolide antibiotics
 - 3) Aminoglycoside antibiotics
 - 4) Tetracycline antibiotics

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 tetracycline antibiotics.
- c) Describe the chemistry, SAR and MOA of penicillin antibiotics.
- d) Describe the SAR and MOA of quinoline antimalarial agents.

Q3) Short answer. (Answer 8 out of 10)

[8×5=40]

- a) Describe the SAR and MOA of antifungal azoles.
- b) Discuss MOA of anti-neoplastic alkylating agents.
- c) Discuss antimetabolites class of anti-neoplastic agents.
- d) Explain MOA of sulphonamides.
- e) Draw the scheme of synthesis for chloroquine.
- f) Describe the SAR and MOA of quinolones anti-infective agents.
- g) Write a note on aminoglycoside antibiotics.
- h) Draw the scheme of synthesis for ethambutol.
- i) Explain chemistry, MOA of plant products use as anticancer agents.
- j) Write a note on anthelmintic drugs.



Total No. of Questions :3]

SEAT No. :

P 947

[5854]-6002

[Total No. of Pages : 2

T.Y. B.Pharmacy
PHARMACOLOGY - III (Theory)
(2019 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)

[15]

- a) Define following term with examples.
 - i) Appetite stimulant
 - ii) Carminative
 - iii) Analeptics
- b) Classify drugs used for constipation and differentiate between laxative and purgative.
- c) Discuss about nasal decongestant. Give mechanism of action of oxymetazoline.
- d) Write a short note on clinical symptoms and management of lead poisoning.
- e) What is peptic ulcer & classify antiulcer drugs.
- f) Write a note on Expectorants.
- g) Classify antifungal drugs and their clinical uses.

Q2) Long Answer. (Answer 2 out of 4)

[20]

- a) Describe in detail mechanism of action, Antibacterial spectrum, adverse effect and uses of sulphonamide.
- b) Classify drugs used in the treatment of UTI & give MOA, pharmacological action, Adverse effect & therapeuticses of cotrimoxazole.
- c) What are clinical manifestations of malaria? Discuss treatment options and non-pharmacological approach for its prevention.
- d) Define Asthma. Discuss mechanism of Action, Pharmaological action, therapeutic uses and adverse effects of salbutamol.

P.T.O.

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

[40]

- a) Write a note on pharmacotherapy of COPD.
- b) Define Biological rhythm & give application of chronopharmacology.
- c) Explain Immunostimulators & Immunodepressants.
- d) Discuss drug treatment of amoebiasis.
- e) Classify anti tubercular drug. Give Adverse effect & therapeutic uses of INH.
- f) Define Helminthiasis, classify anthelmintic drugs & give MOA of Albendazole.
- g) Give the application of monoclonal Antibodies.
- h) Classify β -Lactam Antibiotics, write in detail pharmacology of ampicillin.
- i) Write a short note on pharmacotherapy of Tuberculosis.
- j) Define Immunosuppressants, Classify it & give MOA of Tacrolimus.



Total No. of Questions : 3]

SEAT No. :

P948

[Total No. of Pages : 2

[5854]-6003

T.Y. B.Pharmacy

HERBAL DRUG TECHNOLOGY

(2019 Pattern) (Semester - VI)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

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

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

[5 × 3 = 15]

- a) Write a note on Homeopathic system of medicine.
- b) Explain in detail possible side effects and interaction of Garlic.
- c) Brief note herbal origin perfumes.
- d) Define natural binders along with classification and advantages.
- e) Write a note on Natural sweetener.
- f) Define Patent, Trademark and Biopiracy.
- g) Write a note on Ashwagandha as Nutraceutical.

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

[2 × 10 = 20]

- a) Explain Good agriculture and cultivation practices for medicinal plants.
- b) Define Nutraceuticals. Classify the nutraceuticals in detail with e.g. Explain in detail Proanthocyanidins and Resveratrol.
- c) Explain in detail WHO and ICH guidelines for the assessment of herbal drug, stability testing of herbal drug.
- d) What is *Bhasma*? Describe in detail method of preparation and evaluation parameters for *bhasma* as per Ayurvedic Pharmacopoeia.

P.T.O.

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

[8 × 5 = 40]

- a) Describe basic principles, diagnosis and treatment involved in Ayurveda.
- b) Describe method of preparation and standardization of *Asava-Arishta*.
- c) Discuss the manufacturing process and evaluation parameters for herbal syrup.
- d) Brief note on phytosomes technology, advantages and method of preparation.
- e) Add a note on plant based industries involved in work on medicinal and aromatic plants.
- f) Explain in detail regulatory issues-regulation in India (ASU DTAB, ASU DCC) provisions relating to Ayurvedic, Siddha and Unani system of medicine.
- g) What is drug interactions and explain about the herb drug interactions with examples.
- h) Explain role of nutraceuticals and health benefits in ailment CVS diseases.
- i) Explain in detail case study of Neem and curcumin.
- j) Write a note on Biodynamic agriculture.



Total No. of Questions : 3]

SEAT No. :

P949

[Total No. of Pages : 2

[5854]-6004

T.Y. B.Pharmacy

BIOPHARMACEUTICS AND PHARMACOKINETICS

(2019 Pattern) (Semester - VI)

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) :

[5 × 3 = 15]

- a) Discuss the factors that influence the gastric emptying rate.
- b) What is the effect of protein binding on the action of the drug?
- c) What are the factors that influence passive reabsorption of drugs in the renal tubules?
- d) Describe briefly influence of excipients of drug bioavailability
- e) Name and define the pharmacokinetic processes involved in the termination of drug action.
- f) Explain various physicochemical factors governing drug excretion.
- g) What are the advantages of administering a drug by constant rate i.v. infusion over oral administration.

Q2) Answer the following (Any 2) :

[2 × 10 = 20]

- a) What are pharmacokinetic models? Explain various types with their significance.
- b) What is compartmental modeling? Explain one compartmental open model for i.v. infusion of the drug.
- c) Discuss pH partition hypothesis of drug absorption.
- d) Explain the concept of BCS. Give its significance and add note on BDDCS.

P.T.O.

Q3) Answer the following (any 8) :

[8 × 5 = 40]

- a) Write a note on drug displacement interactions.
- b) Explain in detail about active transport of drug.
- c) Write on non-linear Pharmacokinetics.
- d) Describe Wagner-Nelson method.
- e) Write a note on IVIVC.
- f) What are the various factors related to dissolution test apparatus?
- g) Write a detail note on kinetics of protein binding.
- h) Write a note on enterohepatic cycling of drug.
- i) Explain study Parameters in BA studies.
- j) Explain permeability limited drug distribution.



Total No. of Questions : 3]

SEAT No. :

P950

[Total No. of Pages : 2

[5854]-6005

Third Year B. Pharmacy

**PHARMACEUTICAL BIOTECHNOLOGY
(2019 Pattern) (Semester - VI) (BP 605T)**

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 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 vaccine.
- 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.



Total No. of Questions : 3]

SEAT No. :

P951

[Total No. of Pages : 2

[5854]-6006

Third Year B. Pharmacy

PHARMACEUTICAL QUALITY ASSURANCE

(2019 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) Differentiate calibration and validation.
- b) State functions of WHO.
- c) What is stress testing of the drug substance?
- d) What is IQ and OQ?
- e) State the importance of Training.
- f) What is prospective validation?
- g) State the need and objectives of validation.

Q2) Attempt any two of the following. **[20]**

- a) Define Quality Assurance. Discuss the functions of QA department in pharmaceutical industry.
- b) What is ISO? Why should a pharmaceutical company become ISO certified? Elaborate benefits, and elements of ISO.
- c) State guidelines for selection and purchase of equipments in pharmaceutical industry.
- d) Discuss importance of documentation in pharmaceutical industry. Elaborate on master production and control record.

Q3) Attempt any eight of the following. **[40]**

- a) Define Quality. State principles of TQM.
- b) Write a short note of USFDA.
- c) Elaborate on handling of return goods.

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- d) Write a short note on sanitation in sterile manufacturing facility.
- e) State the importance of IPQC testing.
- f) State precautions to avoid mix up and cross contamination during manufacturing.
- g) Describe importance and content of SOP.
- h) Elaborate on accuracy and precision.
- i) State the content of Distribution record.
- j) What are Quality control tests for containers?

