

Total No. of Questions : 3]

SEAT No. :

PE-4888

[Total No. of Pages : 2

[6569]-1

First Year B. Pharmacy

BP 101T : HUMAN ANATOMY AND PHYSIOLOGY-I

(Rev. 2019) (Semester - I)

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 (Any 5) :

[5 × 3 = 15]

- a) Write the functions of cell
- b) Define and classify tissue
- c) Draw a neat well-labelled diagram of internal structure of skin.
- d) Write the composition of blood
- e) Explain the functions of lymphatic system
- f) Draw a neat-labelled diagram of internal structure of eyeball
- g) Explain passive transport mechanism.

P.T.O.

Q2) Answer the following (Any 2) :

[2 × 10 = 20]

- a) Draw a neat well-labelled diagram of internal structure of heart. Describe in detail phases of cardiac cycle
- b) Enlist clotting factors. Describe in detail blood coagulation pathway and add a note on haemostatic control mechanism of blood coagulation.
- c) Draw a neat-labelled diagram of plasma membrane. Describe in detail transport across cell membrane.
- d) Classify nervous system. Write the structure and functions of parasympathetic nervous system.

Q3) Answer the following (Any 8) :

[8 × 5 = 40]

- a) Discuss in short about nervous tissue.
- b) Explain the conduction system of heart
- c) Add note on Neuromuscular Junction
- d) Explain ABO and Rh blood group system
- e) Define and classify joints.
- f) Explain the functions of Integumentary system
- g) Explain the Electrocardiogram
- h) Discuss in short about Protein synthesis
- i) Write a note on anatomy and physiology of ear.
- j) Discuss about reticulo-endothelial system



Total No. of Questions : 3]

SEAT No. :

PE-4889

[Total No. of Pages : 2

[6569]-2

F.Y. B. Pharmacy

BP 102 T : PHARMACEUTICAL ANALYSIS -I

(Revised 2019) (Semester - I)

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 diagrams wherever necessary.*

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

[5 × 3 = 15]

- a) Discuss principle of Polarography.
- b) Explain the term specific and molar refraction.
- c) Explain Ilkovic equation used in Polarography.
- d) Discuss the term co-precipitation.
- e) Classify acid base titrations.
- f) Discuss advantages and limitations of Mohrs Method.
- g) Define oxidizing and reducing agent with example

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

[2 × 10 = 20]

- a) Discuss in detail the electrochemical cell. Explain the construction and working of Standard Hydrogen Electrode and Calomel Electrode.
- b) Explain the methods of expressing concentration in the Pharmaceutical solution and application of Pharmaceutical analysis.
- c) What is complexometric titration? Classify them with Suitable examples. Discuss metal ion Indicators.
- d) Explain an Error, Types of Errors and methods to minimization errors.

P.T.O.

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

[8 × 5 = 40]

- a) Explain construction and working of dropping mercury Electrode used in Polarography.
- b) Write principle and procedure for estimation of Sodium Chloride IP.
- c) Write note on Cerimetry.
- d) Explain Steps involved in Gravimetric Analysis.
- e) Discuss Titrations with Potassium Iodate I.P.
- f) Write note on Volahards Method.
- g) Explain acidimetry and alkalimetry titration in non-aqueous titration.
- h) Explain working of Abbes refractometer.
- i) Explain Masking and demasking reagents.
- j) Explain principle and procedure for estimation of Calcium Gluconate.



Total No. of Questions : 3]

SEAT No. :

PE-4890

[Total No. of Pages : 2

[6569]-3

F.Y. B. Pharmacy

BP 103 T : PHARMACEUTICS-I

(Rev. 2019) (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 well labelled diagrams wherever necessary.*
- 4) *Do not write anything on question paper except seat number.*

Q1) Short answer questions (solve 5 out of 7) [15]

- a) Differentiate between ointments and pastes. [3]
- b) Define Incompatibility. Give any two examples of therapeutic Incompatibility. [3]
- c) Define pharmaceutical suspension and give two examples. [3]
- d) Write about calibration of suppository mould. [3]
- e) Write classification of solid, liquid, semisolid dosage form. [3]
- f) Difference between flocculated and deflocculated suspensions. [3]
- g) List out various roles of pharmacist in health care system. [3]

Q2) Long Answer Questions (Solve 2 out of 4) [20]

- a) Explain different stability problems of emulsions. [10]
- b) Define solubility. Discuss techniques of solubility enhancement in detail. [10]
- c) Discuss physical and chemical incompatibilities, Describe methods to overcome physical and chemical incompatibility with examples. [10]
- d) Define Prescription. Discuss Parts of prescription and Errors in prescription. [10]

P.T.O.

Q3) Short answer questions (solve 8 out of 10) [40]

- a) Discuss formulation aspects of suspensions. [5]
- b) What are the factors affecting dose of drug? [5]
- c) Define Posology. Explain different paediatric dose calculations. [5]
- d) Write a note on history of pharmacy profession. [5]
- e) Define and classify Powders. Discuss advantages and disadvantages of powders. [5]
- f) Write a note on excipients used in formulation of liquid dosage forms. [5]
- g) Define gargles and give two examples. What is the main difference between a gargle and a mouth wash? [5]
- h) Define displacement value. Describe its importance and explain how it is calculated with an example. [5]
- i) Write a note on the types of syrups with examples and uses. [5]
- j) What is caking in suspensions? Discuss how it affects the quality of suspension. [5]



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SEAT No. :

PE-4891

[Total No. of Pages : 2

[6569]-4

First Year B. Pharmacy

**BP-104T : 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 suitable diagram wherever necessary.*
- 4) *Do not write anything on question paper except seat number.*

Q1) Attempt any five out of seven :

[5 × 3 = 15]

- a) Explain in brief about Iodine and its preparations.
- b) What are Emetics? Give its classification.
- c) Describe manufacturing hazard as source of impurity.
- d) Explain terms lewis acid and lewis base giving suitable examples.
- e) Give preparations and uses of sodium fluoride.
- f) Describe the units of radioactivity.
- g) Explain acidifiers.

Q2) Attempt any two out of four :

[2 × 10 = 20]

- a) Define limit test? Explain in detail the limit test for Chloride and Sulphate.
- 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 and
 - ii) Calcium Gluconate
- d) What is radioactivity? Explain properties of alpha, beta & gamma radiations. Add a note on pharmaceutical applications of radioactive substances.

P.T.O.

Q3) Attempt any eight out of ten :

[8 × 5 = 40]

- a) Write a note on treatment of cyanide poisoning.
- b) Give the preparation, identification tests, assay and medicinal uses of Copper sulphate.
- c) Give the preparation, identification tests, assay and medicinal uses of Aluminum hydroxide gel.
- d) Explain in detail about ORS.
- e) What are anticaries agents? Mention the role of fluoride as anticaries.
- f) Explain limit test for Iron.
- g) Give functions of major extracellular cations and anions.
- h) Describe about Cathartics.
- i) Give official test of waters and control test of it.
- j) Give the history of Pharmacopeia.



Total No. of Questions : 3]

SEAT No. :

PE-4892

[Total No. of Pages : 2

[6569]-5

First Year B. Pharmacy

BP-201T : HUMAN ANATOMY AND PHYSIOLOGY - II

(Rev. 2019 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

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

Q1) Attempt any five of the followings (Any 5 out of 7) : [5 × 3 = 15]

- a) Enlist functions and subdivisions of nervous system.
- b) Explain role of pepsin in protein digestion.
- c) Draw labeled diagram of female reproductive system.
- d) Give composition and functions of gastric juice.
- e) Explain the structure of neuron.
- f) Write note on Basal Metabolic Rate.
- g) Mention the different methods of artificial respiration.

Q2) Attempt any two of the followings (Any 2 out of 4) : [2 × 10 = 20]

- a) Draw neat labelled diagram of human kidney. Explain structure and functions of kidney. Describe in detail physiology of urine formation.
- b) Draw a neat labeled diagram of respiratory system. Explain the regulation of respiration and transport of respiratory gases in detail.
- c) Enlist organs of alimentary canal and its accessory organs. Explain basic structure of alimentary canal.
- d) Explain external and internal structure of spinal cord and its reflex activity.

P.T.O.

Q3) Attempt any eight of the followings (Any 8 out of 10) : [8 × 5 = 40]

- a) Explain Neuromuscular junction.
- b) Write a note on formation and role of ATP.
- c) Explain vital centers present in medulla oblongata and give its special features.
- d) Explain basic structure of tooth and different types and functions of teeth.
- e) Explain various lung volume and lung capacities.
- f) Explain the biosynthesis and functions of thyroid hormones.
- g) Explain physiology of menstrual cycle.
- h) Explain action potential for nerve impulse transmission.
- i) Discuss in detail spermatogenesis process.
- j) Write a note on the role of renin-angiotensin system (RAS) in renal physiology



Total No. of Questions : 3]

SEAT No. :

PE-4893

[Total No. of Pages : 2

[6569]-6

F.Y. B.Pharmacy

BP-202T : PHARMACEUTICAL ORGANIC CHEMISTRY - I

(Rev. 2019) (Semester - II)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

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

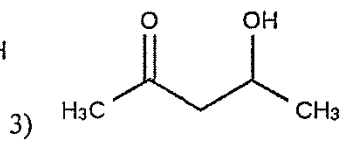
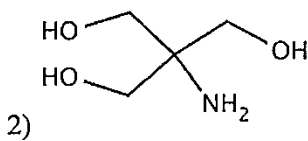
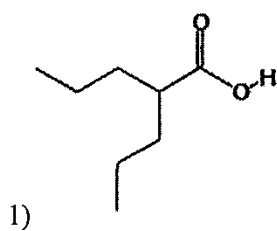
Q1) Solve any five of the following :

[5 × 3 = 15]

a) Draw structures of compounds from following IUPAC names.

- i) 7-octene-1, 2-diol
- ii) 3-bromo-4-methoxy cycloheptanone
- iii) 4-methylpentan-2-yl acetate

b) Write IUPAC names for following structures



- c) Explain the different types of intermolecular forces.
- d) Give structure and uses of lactic acid and tartaric acid.
- e) Explain types of bonds, bond fission in organic compounds.
- f) Give qualitative tests for carboxylic acids and amides.
- g) Explain Qualitative tests of alcohol.

P.T.O.

Q2) Solve any two of the following :

[2 × 10 = 20]

- a) What are alkenes? Give stability of alkenes and two methods of preparation and two chemical reactions of Alkenes.
- b) Describe S_N1 and S_N2 reactions of alkyl halides, give mechanism with evidence.
- c) Explain E1 elimination reaction with mechanism, kinetics and factors affecting. Explain Saytzeff orientation.
- d) Classify amines and describe the reactions for separation of primary, secondary and tertiary amines.

Q3) Solve any Eight of the following :

[8 × 5 = 40]

- a) Explain hybridization of atomic orbitals.
- b) What is Perkin condensation? Explain with examples.
- c) Describe the chemical properties of alcohols with supportive reactions.
- d) Discuss inductive and resonance effect.
- e) Explain in detail Cannizzaro and Cross Cannizzaro reaction of aldehydes.
- f) Discuss the stereochemistry and rearrangement of carbocations.
- g) Describe the basicity order of aliphatic amines, including examples to illustrate the effect of substituents and how they affect reactivity.
- h) Discuss free radical addition reactions of alkenes with examples explaining the rules governing it.
- i) Give the acidity order of following carboxylic acids with justification.
 - i) Fluoroacetic acid
 - ii) Acetic acid
 - iii) Chloroacetic acid
- j) Give structure and uses of
 - i) ethanolamine
 - ii) methyl salicylate
 - iii) paraldehyde



Total No. of Questions : 3]

SEAT No. :

PE-4894

[Total No. of Pages : 2

[6569]-7

F.Y. B.Pharmacy
BP-203T : BIOCHEMISTRY
(2019 Pattern) (Semester - II)

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 diagram whenever necessary.*

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

[15]

- a) Write significance of Adrenaline and Noradrenaline.
- b) Define co-enzymes and co-factors and write two examples of each.
- c) Enumerate two functions of RNA and DNA each.
- d) What is biological significance of ATP?
- e) Write IUB classification of Enzymes.
- f) Describe any three Glycogen storage disorders.
- g) What are deamination and decarboxylation reactions of amino acid metabolism.

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

[20]

- a) Describe enzyme kinetics using Michaelis Menten equation and draw a graph of Michaelis and Lineweaver burk plot.
- b) Explain in detail Kreb's cycle pathway and add a note on its energetics and significance.
- c) Discuss beta oxidation pathway of palmitic acid in detail.
- d) Explain in detail Oxidative phosphorylation & its mechanism and substrate level Phosphorylation Inhibitor.

P.T.O.

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

[40]

- a) Elaborate on Formation and Utilization of ketone bodies.
- b) Describe Urea Cycle.
- c) Give semiconservative model of DNA replication.
- d) Explain electron transport chain and its mechanism.
- e) Draw schematic representation of Gluconeogenesis pathway.
- f) Write the classification and biological role of Carbohydrates.
- g) Explain different mechanisms of enzyme inhibitors with suitable examples.
- h) Describe the details of lipid metabolism disorders- Fatty liver and Atherosclerosis.
- i) Discuss catabolism of purine nucleotides.
- j) Write about synthesis and significance of 5-HT and melatonin.



Total No. of Questions : 3]

SEAT No. :

PE-4895

[Total No. of Pages : 2

[6569]-8

F.Y. B. Pharmacy

BP-204T : PATHOPHYSIOLOGY

(Rev. 2019) (Semester - II)

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) *Figure to the right indicate full marks.*

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

[5 × 3 = 15]

- a) Define atrophy.
- b) List types of hepatitis.
- c) Name two complications of myocardial infarction.
- d) Mention signs of chronic obstructive pulmonary disease.
- e) Enlist causes of schizophrenia.
- f) State major forms of anaemia.
- g) List features of depression.

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

[2 × 10 = 20]

- a) Elaborate on pathogenesis and management of peptic ulcer.
- b) Discuss cell adaptation mechanisms and their clinical significance.
- c) Explain the pathophysiology of acute and chronic renal failure.
- d) Describe cancer classification and etiology.

P.T.O.

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

[8 × 5 = 40]

- a) Write short note on jaundice.
- b) Explain pathogenesis of typhoid.
- c) Discuss pathophysiology of schizophrenia.
- d) Outline steps of inflammation.
- e) Describe mechanisms of anemia.
- f) Write a note on epilepsy.
- g) Explain metabolic bone diseases (osteoporosis, gout).
- h) Discuss pathogenesis of hepatitis.
- i) Describe wound healing process in skin.
- j) Differentiate between acute and chronic inflammation.



Total No. of Questions : 3]

SEAT No. :

PE-4896

[Total No. of Pages : 2

[6569]-9

S.Y. B. Pharmacy

BP-301T : PHARMACEUTICAL ORGANIC

CHEMISTRY - II

(Rev. 2019) (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) Objective Type Questions (Answer 5 out of 7) :

[5 × 3 = 15]

- a) Write any three limitations of Friedel-Crafts alkylation of benzene.
- b) Arrange the following in increasing order of acidity with a reason: phenol, p-nitrophenol, p-methyl phenol.
- c) Give any three qualitative tests for phenols with expected observations.
- d) Predict the orientation and relative reactivity toward nitration for:
 - i) toluene,
 - ii) nitrobenzene,
 - iii) phenol. Justify in one line each.
- e) Define meso compound. Give one example and explain why it is optically inactive.
- f) State Huckel's rule. Apply it to comment on the aromaticity of the cyclopentadienyl anion.
- g) Write short notes Saponification value and give its significance.

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

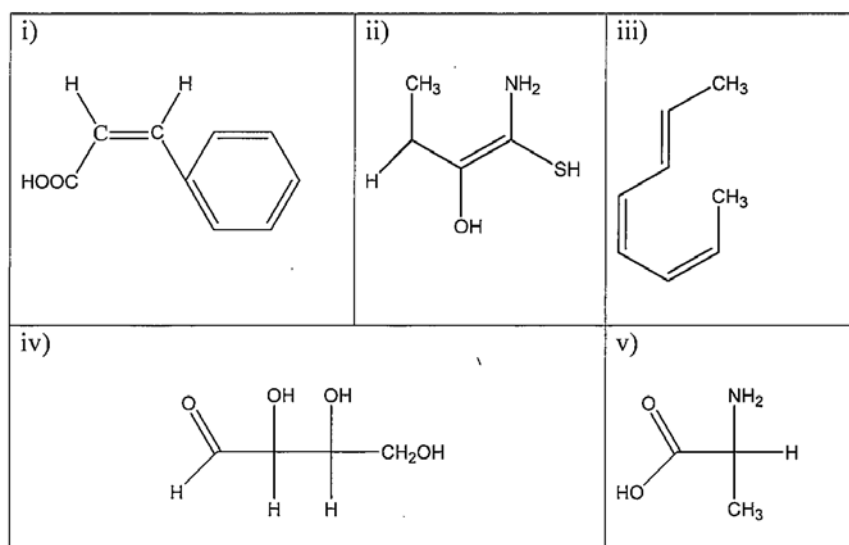
[2 × 10 = 20]

- a) Write the synthesis, chemical reactions and medicinal uses of anthracene and its derivatives.
- b) Explain Baeyer's strain theory for cycloalkanes in detail. Discuss its advantages, limitations and modern modifications.
- c) Explain in detail the orbital picture, Kekule's structure and resonance in benzene. Discuss how these concepts justify the stability and reactivity of benzene.
- d) Describe in detail the various elements of symmetry present in molecules. Illustrate each element with suitable examples and diagrams.

P.T.O.

Q3) Short Answer (Answer 8 out of 10) :**[8 × 5 = 40]**

- Give the mechanism of Friedel-Crafts acylation and explain why polyacylation does not occur.
- With resonance and inductive arguments, compare the basicity of aniline, p-methoxyaniline and p-nitroaniline.
- Explain nitrosation and azo-coupling of aromatic amines. Give one synthetic application for each.
- Write short notes on cresols, resorcinol, naphthols-structure, one key reaction each and two medicinal/industrial uses (any two compounds).
- Define and distinguish optical activity vs specific rotation. Explain why a racemic mixture is optically inactive though composed of active isomers.
- Explain cis/trans and E/Z nomenclature. Illustrate with 2-butene and 1-bromo-1-chloro-2-fluoroethene. State one method of configuration determination.
- Give the synthesis (any one), orientation of substitution and two reactions of phenanthrene or anthracene. Include a brief note on any medicinal use/derivative
- Describe reactions of cyclopropane and cyclobutane with suitable mechanisms.
- Explain hydrolysis, hydrogenation, saponification and rancidity of fats and oil with two methods to prevent rancidification.
- Assign configurations to the following



Total No. of Questions : 3]

SEAT No. :

PE-4897

[Total No. of Pages : 2

[6569]-10

S.Y. B. Pharmacy

BP-302T : PHYSICAL PHARMACEUTICS-I

(Rev. 2019) (Semester - III)

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 suitable diagrams wherever necessary.
- 4) Do not write anything on question paper except seat number.

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

[5 × 3 = 15]

- a) List and explain in brief properties of ideal gases.
- b) Describe Sorensen's pH scale.
- c) Write about the dielectric constant and dipole moment.
- d) Name various pharmaceutical applications of phase diagram of three component systems.
- e) Discuss the significance of vander Waal's constants for real gases.
- f) Illustrate Bragg's equation.
- g) State and explain the significance of Fick's first law of diffusion.

Q2) Long Answers (Answer 2 out of 4)

[2 × 10 = 20]

- a) Elaborate Raoult's law and its deviations with examples.
- b) Compare capillary rise method and drop pipette method for determination of surface tension. Write principle and method to determine surface tension using these methods.
- c) How complex is formed? Enumerate different methods of analysis of complex. Explain the distribution method and continuous variation method of analysis in detail.
- d) Demonstrate principles and methods of liquefaction of gases. Write about the working of aerosols.

P.T.O.

Q3) Short Answers (Answer 8 out of 10)

[8 × 5 = 40]

- a) Summarize surface free energy.
- b) Classify Polymorphism.
- c) Explain One component system.
- d) Outline Pharmaceutical & biological buffers.
- e) Glass transition temperature.
- f) Recall the concepts in adsorption isotherms.
- g) Methods of crystal analysis.
- h) Outline significance of Protein binding
- i) Illustrate Solute-solvent interactions.
- j) Justify Du Nouy ring method for determination of surface tension.



Total No. of Questions : 3]

SEAT No. :

PE-4898

[Total No. of Pages : 2

[6569]-11

S.Y. B. Pharmacy

BP 303 T : PHARMACEUTICAL MICROBIOLOGY

(Rev. 2019) (Semester - III)

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 right indicate full marks.*

Q1) Answer the following (any five) :

[5 × 3 = 15]

- a) Differentiate between Prebiotics & Probiotics.
- b) Justify Agar is used as solidifying agents.
- c) Write ideal properties of preservatives.
- d) Enlist different sources of contamination in an aseptic area.
- e) Write advantages and disadvantages of microbial assay method.
- f) Differentiate between Gram positive and Gram negative bacterial cell.
- g) Enlist factors affecting microbial spoilage.

Q2) Answer the following (any two) :

[2 × 10 = 20]

- a) How will you perform sterility testing of pharmaceutical product as per I.P.?
- b) Draw and describe in brief typical structure of bacteria and give the function of each part.
- c) Write in detail the different sources and types of microbial contamination of pharmaceutical products. Write a note on assessment of microbial contamination and spoilage.
- d) Write in detail identification of bacteria using different staining techniques.

P.T.O.

Q3) Answer the following (any eight) :

[8 × 5 = 40]

- a) Write different factors affecting disinfectant action.
- b) Explain different branches of microbiology.
- c) Write a note on IMViC test.
- d) Write working, applications, advantages & limitations of autoclave.
- e) Explain the different methods used for preservation of pure cultures.
- f) Write a note on microbiological assay of vitamin B₁₂.
- g) Write a note on Rideal Walker Test.
- h) Explain general procedure for cell culture.
- i) Explain the different methods used for cultivation of human viruses.
- j) Write a note on laminar flow equipments.



Total No. of Questions : 3]

SEAT No. :

PE-4899

[Total No. of Pages : 2

[6569]-12
Second Year B. Pharmacy
BP 304 T: Pharmaceutical Engineering
(Rev. 2019) (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.*

Q1) Attempt any five of the following :

[15]

- a) What is the principle of pitot tubes?
- b) State the principle of molecular distillation.
- c) Draw a neat labelled diagram of a non-perforated basket centrifuge.
- d) Explain economy and capacity of multiple effect evaporator.
- e) State the application of centrifugation.
- f) State the factors influencing rate of evaporation.
- g) Explain in short heat transfer mechanism by conduction.

P.T.O.

Q2) Attempt any Two of the following :

[20]

- a) Explain the principle, construction, working and applications of spray dryer.
- b) Explain the theory of drying.
- c) Classify flow meters. Describe principle, construction working and applications of venturi meter.
- d) Classify equipments used for mixing of semisolids. Describe the principle, construction and working of ribbon blender.

Q3) Attempt any Eight of the following :

[40]

- a) Write a note on calandria evaporator.
- b) Describe Zig-Zag sifter.
- c) Explain bucket type of steam trap.
- d) Describe sigma blade mixer.
- e) Explain principle, construction and working of falling film evaporator.
- f) Describe factors influencing the process of filtration.
- g) Write a note on types of corrosion and enlist methods to prevent corrosion.
- h) Explain the official standards of powders, write a note on elutriation tank.
- i) Write a note on the theory of azeotropic distillation.
- j) Write a note on feed method in multiple effect evaporators.



Total No. of Questions : 3]

SEAT No. :

PE-4901

[Total No. of Pages : 2

[6569]-14

S.Y. B. Pharm

BP402T : MEDICINAL CHEMISTRY - I

(Rev. 2019) (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 any five questions out of seven questions.

[5 × 3 = 15]

- a) Explain the SAR of Morphinan derivatives
- b) Explain biosynthesis and metabolism of Acetylcholine.
- c) Sketch out synthetic route for Salbutamol.
- d) Discuss chemistry and Mechanism of Action (MOA) of barbiturates as anticonvulsant agents.
- e) Write a note on optical and geometrical isomerism and its effect on biological activity.
- f) Write down structure, MOA and uses of Halothane.
- g) Explain the chemistry and MOA of Propionic acid derivatives as Anti-inflammatory agents

Q2) Answer any two questions out of four questions.

[2 × 10 = 20]

- a) What are narcotic analgesics? Write note on modifications of Morphine nucleus along with SAR and MOA of Morphine analogues. Write structures of Mepiridine and Fentanyl.
- b) What are major pathways of metabolism? Discuss Phase I Reactions with examples.
- c) Classify Sympathomimetic agents. Explain Structure Activity Relationship (SAR), MOA and uses of adrenergic agonists.
- d) Define and classify anticholinergic agents with examples. Explain in detail chemistry, SAR, MOA and uses of Atropine. Outline the synthesis of dicyclomine.

P.T.O.

Q3) Answer any eight questions out of ten questions.

[8 × 5 = 40]

- a) Discuss the chemistry, MOA and uses of Beta adrenergic blockers with examples.
- b) What are general anaesthetics? Discuss in detail Ultra-short acting barbiturates as general anesthetics.
- c) Write structure , MOA and therapeutic uses of Propranolol and Phenylephrine.
- d) Discuss MOA, SAR and therapeutic uses of Benzodiazepine as sedatives and hypnotics with examples
- e) Discuss chemistry, MOA and uses of succinimides and oxazolidinediones
- f) Write a note on AChE Inhibitors
- g) Discuss in detail ii chemistry, SAR and MOA of Aryl acetic acid class of NSAIDs. Write down synthesis of Diclofenac.
- h) Explain MOA and SAR of direct acting cholinergic agents.
- i) Outline the synthesis of Diazepam and Carbamazepine.
- j) Give detail account on chemistry, mechanism of action and uses of Haloperidol and Chlorpromazine



Total No. of Questions : 3]

SEAT No. :

PE-4902

[Total No. of Pages : 2

[6569]-15

S.Y. B. Pharmacy

BP403T : PHYSICAL PHARMACEUTICS - II
(2019 Pattern) (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) Answer all the questions (Any 5 out of 7)

[5 × 3 = 15]

- a) Define Surface diameter, Volume diameter and Projected diameter.
- b) Explain wetting of solids
- c) Differentiate between true solution, colloidal solution and dispersed system
- d) Explain working of multipoint viscometer.
- e) Comment on Ostwald ripening.
- f) Explain Anderson-pipette method for particle size determination
- g) Differentiate between flocculated and deflocculated suspensions.

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

[2 × 10 = 20]

- a) Derive rate constant equation for zero order reaction along with its half-life and shelf life
- b) Give the detailed account of derived properties of powders
- c) Explain different Instabilities and their corrective measures of Emulsion
- d) Explain different factors affecting chemical stability of drugs and add a note on

P.T.O.

Q3) Short Answers (Any 8 out of 10)

[8 × 5 = 40]

- a) Explain order of reaction and molecularity of reaction.
- b) Classify type of flow. Explain pseudoplastic flow.
- c) Write a note on Kinetics and Optical properties of Colloids
- d) Write a note on Rheology of suspension
- e) Explain different theories of emulsification
- f) Write a note on DLVO theory and its significance
- g) Explain the preservation of emulsion
- h) Differentiate between Lyophilic and Lyophobic colloids
- i) Write note on Thixotropy
- j) Elaborate the methods of purification of colloids.



Total No. of Questions : 3]

SEAT No. :

PE-4903

[Total No. of Pages : 2

[6569]-16
S.Y. B. Pharmacy
BP404T : PHARMACOLOGY - I
(Rev. 2019) (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)

[5 × 3 = 15]

- a) Define and classify drug antagonism with example.
- b) What is drug dependence? Give an example.
- c) Explain why levodopa is combined with carbidopa.
- d) Define hypnotics and give two examples.
- e) Define Pharmacovigilance
- f) Define and Classify Drug Interactions
- g) What are CNS stimulants? Provide examples and uses.

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

[2 × 10 = 20]

- a) Explain in detail the metabolism of drugs, including stages and enzymes involved. Add a note on enzyme induction.
- b) Define and Classify sedatives and Hypnotics with examples and write Pharmacological effects and uses of them
- c) Discuss the pharmacology of Parkinson's disease. Explain the 'on and off' phenomenon.
- d) Define and classify clinical trials and explain the design and data collection. Add a note on pharmacovigilance.

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 the stages of anesthesia.
- b) Classify alpha-adrenergic blockers and describe their therapeutic uses.
- c) Explain the pharmacokinetic terms bioavailability and half-life.
- d) Define and classify antiepileptic drugs. Describe the mechanism of action and therapeutic uses of valproic acid.
- e) Define and classify antidepressants. Write the uses and adverse effects of tricyclic antidepressants.
- f) Classify opioid analgesics and describe the therapeutic uses and adverse effects of morphine.
- g) Define drug distribution and write factors affecting it. Add a note on volume of distribution.
- h) Write a note on the rational use of medicines and rational drug prescribing.
- i) Define biotransformation. Write factors affecting it and add a note on enzyme inhibition with examples.
- j) Discuss the phases of clinical trials and the meaning of a 'double-blind, placebo-controlled, randomized clinical trial.'



Total No. of Questions : 3]

SEAT No. :

PE-4904

[Total No. of Pages : 2

[6569]-17

S.Y. B. Pharmacy

**BP-405 T : PHARMACOGNOSY AND
PHYTOCHEMISTRY - I
(Rev. 2019) (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) *Neat labeled diagrams must be drawn wherever necessary.*

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

[5 × 3 = 15]

- a) What are proteins and enzymes? Add a note on their applications.
- b) Give biological source and chemical tests for papain.
- c) Write different chemical tests for Castor oil.
- d) Write general chemical tests for tannins.
- e) Explain chemical Test for Volatile oil.
- f) Describe plant fruit anatomy with a neat diagram.
- g) Define and classify different types of stomata.

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

[2 × 10 = 20]

- a) Define Adulteration, enlist its types and explain all Evaluation parameters of Herbal drug.
- b) Define Pharmacognosy and explain history, scope and development of Pharmacognosy.
- c) Define and classify lipids, Describe extraction of shark liver oil and cod liver oil.
- d) Discuss different methods of Cultivation and give factors influencing cultivation of medicinal plants.

P.T.O.

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

[8 × 5 = 40]

- a) Write a note on Cotton & Hemp.
- b) Describe general anatomy and morphology of subterranean organs.
- c) Classify Resins in detail along with examples.
- d) Define and explain classification of crude drugs.
- e) Explain in detail polyploidy and mutation technique of medicinal plants.
- f) Define and classify Carbohydrate with examples.
- g) Describe general anatomy and morphology of bark.
- h) Describe general nutrition requirement of plant tissue culture.
- i) Define and classify Glycosides. Give chemical tests for Glycosides.
- j) Write a note on various methods of adulteration.



Total No. of Questions :3]

SEAT No. :

PE4905

[Total No. of Pages : 2

[6569]-18

Third Year B.Pharmacy

BP501T: MEDICINAL CHEMISTRY-II

(2019 Pattern) (Semester-V) (Revised) (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) *Draw well-labelled diagrams wherever necessary.*
- 4) *Do not write anything on the question paper except seat number.*

Q1) Attempt the following (Any five)

[5×3=15]

- a) Define anti-hypertensive agents, Classify anti-hypertensive agents with examples.
- b) Explain mechanism of action and medicinal applications of proton pump inhibitors with examples.
- c) Explain nomenclature and stereochemistry of Steroids.
- d) Write structure and medicinal applications of Nitroglycerin.
- e) Explain mechanism of action and medicinal applications of Simvastatin.
- f) Explain mechanism of action and medicinal applications of Metformin.
- g) Explain mechanism of action and medicinal applications of Digitoxin.

Q2) Attempt the following (Any two)

[2×10=20]

- a) Draw structure of Histamine, Classify Antihistaminic agents with examples, Write SAR of first- generation antihistaminic agents justifying with structures
- b) Define and Classify Diuretics with examples, write mechanism of action and medicinal applications of Spironolactone, Ethacrynic acid.
- c) Classify Local anesthetics with examples. Write medicinal applications and SAR of Local anesthetics justifying with structures.
- d) Explain the term Arrhythmia. Write Causes of Arrhythmia. Classify anti-arrhythmic agents with examples Write mechanism of action, medicinal applications, adverse effects of Quinidine and Sotalol.

P.T.O.

Q3) Attempt the following (Any eight)

[8×5=40]

- a) Write mechanism of action, medicinal applications and synthesis of Benzocaine.
- b) Write mechanism of action, medicinal applications and synthesis of Atorvastatin.
- c) Write mechanism of action, medicinal applications and synthesis of Isosorbide dinitrate.
- d) Draw structure write mechanism of action and medicinal applications of Chlorthiazide.
- e) Draw structure write mechanism of action and medicinal applications of Lisinopril.
- f) Draw structure write mechanism of action and medicinal applications of Diphenhydramine.
- g) Write mechanism of action and medicinal applications of Mannitol and Fexofenadine
- h) Write mechanism of action and medicinal applications of Amlodipine and Mifepristone.
- i) Write mechanism of action and medicinal applications of Chlorpheniramine and Valsartan.
- j) Write biosynthesis of L-Thyroxine and L-Thyronine.



Total No. of Questions : 3]

SEAT No. :

PE4906

[Total No. of Pages : 2

[6569]-19

Third Year B. Pharmacy (Pharmaceutics)

BP 502T : INDUSTRIAL PHARMACY - I

(Revised 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) Long Answers (Any 2).

[2×10=20]

- a) Define biphasic dosage form. Give preformulation and formulation considerations of emulsions.
- b) Give the need of tablet coating. Discuss excipients used in film coating. Explain fluidized bed coater in detail.
- c) Define Capsules. Explain the manufacturing of empty gelatin capsules. Give quality control tests of hard gelatin capsules.
- d) Define parenterals. Give classifications of parenterals and describe in detail aseptic processing of parenterals in detail.

Q2) Short Answers (any 8).

[8×5=40]

- a) Explain important physicochemical properties of preformulation.
- b) Differentiate between capping and lamination and explain remedies to overcome.
- c) Define granulation. Explain wet granulation along with mechanism.

P.T.O.

- d) Define parenterals. Explain preservative and tonicity adjusting agents used in parenterals.
- e) Add a note on sugar coating.
- f) Explain the official disintegration test of tablets.
- g) Write a short note on sunscreens.
- h) Write in brief about softgels.
- i) Define ophthalmics. Explain in detail quality control tests of ophthalmics.
- j) Enlist tablet defects. Explain any three defects in detail.

Q3) Short Answers (any 5).

[5×3=15]

- a) What is enteric coating?
- b) Give significance of isotonicity in ophthalmic dosage form.
- c) Describe weight variation test of tablets as per IP.
- d) What is bacterial endotoxin test?
- e) What is orange peel effect?
- f) Enlist different parts of pharmaceutical aerosol product container.



Total No. of Questions : 3]

SEAT No. :

PE4907

[Total No. of Pages : 2

[6569]-20

Third Year B. Pharmacy

BP 503T : PHARMACOLOGY - II

(Revised 2019 Pattern) (Semester - V)

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 of the following.

[15]

- a) Justify the role of cardiac glycosides in treatment of CCF.
- b) Enlist the hormones secreted by Anterior pituitary with physiological role.
- c) Define oxytocic agents and give mechanism & uses of oxytocin.
- d) Comment on role of beta blockers in angina pectoris.
- e) Write mechanism of actions of class I anti - arrhythmic agents.
- f) Write mechanism of action of warfarin.
- g) Define and classify tocolytics.

Q2) Attempt any two of the following.

[20]

- a) Classify antihypertensive drugs? Explain pharmacotherapy for hypertension.
- b) Write principle and types of the bioassay. Add a note on bioassay of d-tubercurarine.
- c) Discuss biosynthesis, mechanism of action, pharmacological actions and therapeutic uses of testosterone.
- d) Classify diuretics. Explain mechanism of action, adverse effect and therapeutic uses of furosemide.

P.T.O.

Q3) Attempt any eight of the following.

[40]

- a) Write the mechanism of action and uses of quinidine.
- b) Explain pharmacological action of aspirin.
- c) Write a note on selective estrogen-receptor modulators [SERMs].
- d) Explain the clinical significance of COX - 2 inhibitors.
- e) Classify antithyroid drug. Explain pharmacological action of any one antithyroid drug.
- f) Write a note on disease – modifying antirheumatic drugs [DMARDs]
- g) Write mechanism, adverse effect and uses of diltiazem verapamil and nifedipine?
- h) What are the advantage of Angiotensin receptors blockers over ACE inhibitors?
- i) Discuss the bioassay of histamine.
- j) Write a note on corticosteroids.



Total No. of Questions : 3]

SEAT No. :

PE4908

[Total No. of Pages : 2

[6569]-21

Third Year B. Pharmacy

BP 504T : PHARMACOGNOSY AND PHYTOCHEMISTRY - II

(Revised 2019 Pattern) (Semester - V)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates:

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

Q1) Objective type questions. (Any 5 out of 7)

[5×3=15]

- a) Utilization of Sennosides.
- b) What is Solid Phase Extraction? Give it's applications.
- c) Give the sources and uses of any two volatile oil containing drugs.
- d) Define Plant Secondary Metabolite with example.
- e) List the Bio source, constituents and uses of an Oleo gum resin drug you have studied.
- f) Write the method of estimation of Digoxin.
- g) Give Biosource and chemical constituents of Clove.

Q2) Answers to following (Any 2 out of 4).

[2×10=20]

- a) Present the salient Pharmacognostic features of Digitalis.
- b) Explain in detail the principle, working, advantages, disadvantages and applications of supercritical fluid extraction.
- c) Detail the function, mechanism and products derived via the Acetate - Mevalonate Pathway.
- d) Discuss the industrial production of Diosgenin products. How is it estimated?

P.T.O.

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

[8×5=40]

- a) Explain with a neat labelled diagram the diagnostic microscopic characters of Coriander.
- b) Write short notes on Tracer technique and its significance.
- c) Write the applications of High Performance Thin Layer chromatography in crude drug identification.
- d) Explain in detail the Shikimic acid pathway.
- e) Discuss the role of fractional crystallization in phytochemistry.
- f) Outline the procedure for the isolation and estimation of Glycyrrhetic acid.
- g) Explain in detail Hot Continuous Percolation.
- h) Describe the production procedure for natural caffeine extraction from tea waste.
- i) Give the Biosource, chemical constituents and uses of Ginger and Vinca.
- j) Describe the industrial production and estimation of Podophyllotoxin.



Total No. of Questions : 3]

SEAT No. :

PE4909

[Total No. of Pages : 2

[6569]-22

Third Year B.Pharmacy

BP 505T : PHARMACEUTICAL JURISPRUDENCE

(Revised 2019 Pattern) (Semester-V)

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 (objectives) Answer 5 out of 7) **[5×3=15]**

- a) What is process patent?
- b) Write the constitution of pharmacy council of India.
- c) Write the forms used for licence for retail drugs, restricted licence and wholesale?
- d) What are misbranded drugs?
- e) What is illicit traffic?
- f) What are coca derivatives, opium derivatives and opium poppy?
- g) What are schedule G and H?

Q2) Long Answer (Any 2 out of 4) **[2×10=20]**

- a) What are the objectives of DPCO, 1995. Explain in detail prices of bulk drugs and retail price of formulation.
- b) Discuss in detail the objectives and salient features of Medical Termination of Pregnancy Act, 1971 and Rules 1975.
- c) Discuss in detail objectives and salient features of the prevention of cruelty to Animals Act, 1960.
- d) Explain different forms of IPR

P.T.O.

Q3) Short Answers (Any 8 out of 10)

[8×5=40]

- a) Procedure for obtaining license to manufacture medicinal & toilet preparations containing alcohol.
- b) Exclusive marketing right.
- c) Write short note on loan license.
- d) Hathi committee and Mudaliar committee
- e) Retail price of formulations.
- f) Qualification and duties of Government Analyst under D & C act.
- g) Controlled operations under narcotic drugs & psychotropic substances act.
- h) Write short note on Schedule M.
- i) Explain “Education Regulation” under pharmacy Act, 1948
- j) Adulterated drugs.



Total No. of Questions : 3]

SEAT No. :

PE-4910

[Total No. of Pages : 2

[6569]-23
T. Y. B. Pharmacy
BP601T : MEDICINAL CHEMISTRY - III
(2019 Rev. 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 antibiotics with suitable examples.
- b) Define and classify antimalarial agents with suitable examples.
- c) Enlist the drug's use to treat infections caused by parasitic worms.
- d) Enlist Plasmodium parasites which cause malaria.
- e) Define and classify macrolide antibiotics with suitable examples.
- f) Define lead molecule. How are they useful in drug discovery?
- g) Enlist Aminoglycoside antibiotics with their therapeutic uses.

Q2) Long Answer (Answer 2 out of 4)

[2 × 10 = 20]

- a) Discuss chemistry, SAR and MOA of tetracyclines.
- b) Discuss chemistry, SAR and MOA of quinolines antimalarials.
- c) What is QSAR, explain its importance in drug design and describe physicochemical parameters used in QSAR analysis.
- d) Describe the chemistry, MOA and SAR of sulphonamides.

P.T.O.

Q3) Short Answer (Answer 8 out of 10)

[8 × 5 = 40]

- a) Describe the chemistry and MOA of alkylating agents as anti-neoplastic agents.
- b) Describe the chemistry and MOA of penicillin.
- c) Write a note on Ferguson principle.
- d) Explain chemistry and MOA of kinase inhibitors as anti-neoplastic agents.
- e) Draw structure of norfloxacin explain its MOA and give its uses.
- f) What are antiviral agents? Give the structure and uses of zidovudine.
- g) Why sulphonamide class of drugs may cause crystalluria.
- h) Write a note on anticancer antibiotics.
- i) Draw the scheme for synthesis of metronidazole.
- j) Draw the scheme for synthesis of chloramphenicol.



Total No. of Questions : 3]

SEAT No. :

PE4911

[Total No. of Pages : 2

[6569]-24

Third Year B. Pharmacy

BP602T : PHARMACOLOGY - III

(Revised 2019 Pattern) (Semester - VI) (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 be right indicate full marks.*

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

[5×3=15]

- a) Write a flow chart showing life cycle of plasmodium species.
- b) Give Pharmacotherapy of cough
- c) Define acute, subacute and chronic toxicity
- d) Define Chronopharmacology with its applications.
- e) Define appetite stimulant and digestant with examples
- f) Classify anthelmintics drugs & Give MOA of albendazole
- g) Justify why sulfamethoxazole is given in combination with trimethoprim

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

[2×10=20]

- a) Classify antimalarial drugs & explain radical cure of malaria with different strategy of antimalarial drugs
- b) Define asthma. Discuss mechanism of action, pharmacological actions, therapeutic uses and adverse effects of salbutamol.
- c) What is DOTS? Classify anti TB drugs with examples. Write the MOA, adverse effect and uses of INH.
- d) Classify antiemetic drugs. Explain pharmacology of 5HT₃ Antagonist and prokinetic drugs.

P.T.O.

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

[8×5=40]

- a) Discuss drug treatment of amoebiasis.
- b) Write clinical symptoms and outline steps involved in the treatment of barbiturates poisoning.
- c) Write a brief note on non-systemic antacids in case of peptic ulcer.
- d) What do you understand by cancer? Classify anticancer drugs with MOA of alkylating agents.
- e) Define broad spectrum antibiotics. Explain the mechanism of action of tetracycline.
- f) Write a short note on pharmacotherapy of diarrhoea.
- g) Explain in detail Teratogenicity.
- h) Give the application of monoclonal antibodies.
- i) Classify antiviral drugs with side effects & therapeutic uses of Acyclovir.
- j) Classify antifungal drugs with MOA & therapeutic uses of amphotericin.



Total No. of Questions :3]

SEAT No. :

PE4912

[Total No. of Pages : 2

[6569]-25

T.Y. B. Pharmacy

B P 603T : HERBAL DRUG TECHNOLOGY

(2019 Revised Pattern) (Semester-VI)

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, labeled diagrams wherever necessary.*

Q1) Objective Type (Answer any 5 out of 7)

[5×3=15]

- a) Define medicinal plant and herbal formulation.
- b) State importance of authentication of raw material.
- c) Write any three uses of Amla and Spirulina as nutraceuticals.
- d) Explain herbal colourants with examples.
- e) List advantages of phytosomes.
- f) Define Schedule T and its role.
- g) Explain importance of SOPs in herbal drug manufacturing.

Q2) Long Answer Questions (Answer any 2 out of 4)

[2×10=20]

- a) Explain cultivation and post-harvest processing of medicinal plants.
- b) Discuss herb-drug interactions with respect to pharmacokinetic and pharmacodynamic mechanisms.
- c) Explain evaluation of herbal drugs according to WHO/ICH guidelines.
- d) Describe the scope and future prospects of herbal drug industry in India.

P.T.O.

Q3) Short Answer Questions (Answer any 8 out of 10)

[8×5=40]

- a) Define nutraceuticals with examples.
- b) Explain the concept of herbal excipients.
- c) Describe herbal cosmetics used in oral hygiene.
- d) Write a note on Good Agricultural Practices (GAP).
- e) List natural ingredients used in skin-care products.
- f) Explain IPR and patenting issues related to herbal drugs.
- g) Discuss herb-drug interactions involving garlic and ginseng.
- h) Write a note on herbal industry in India.
- i) Explain the regulatory bodies ASU-DCC and ASU-DTAB.
- j) Write short note on stability testing of herbal drugs.



Total No. of Questions : 3]

SEAT No. :

PE4913

[Total No. of Pages : 2

[6569]-26

T.Y.B. Pharmacy

**BP604T : BIOPHARMACEUTICS AND PHARMACOKINETICS
(2019 Pattern) (Semester - VI)**

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 the following (any 5 out of 7) [15]

- a) Define passive diffusion. State Fick's first law of diffusion.
- b) What is polymorphism and its effect on absorption of drug.
- c) Define Biopharmaceutics. State its importance in formulation development.
- d) What is enzyme induction?
- e) Elaborate on Pharmacokinetic approach on assessment of Bioavailability.
- f) Discuss elimination half-life.
- g) Write about the physiological model of pharmacokinetics.

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

- a) Enlist various factors influencing GI absorption of a drug from its dosage form and explain physicochemical factors affecting drug absorption.
- b) Explain the estimation of various pharmacokinetic parameters for one compartment open model for IV bolus.
- c) What do you understand by pharmacokinetic model? Classify the pharmacokinetic models, give their salient features, advantages and disadvantages.
- d) Explain various bioequivalence study designs.

P.T.O.

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

[40]

- a) Add note on Biopharmaceutics classification system.
- b) Explain renal clearance and methods to measure the same.
- c) Discuss the method of residuals for determination of absorption rate constant.
- d) Discuss the factors that influence the gastric emptying rate.
- e) Estimation of V_{max} and K_m .
- f) Why drugs are better absorbed from small intestine? Explain.
- g) Discuss patient related factors that influence GI absorption of drug.
- h) Discuss non-compartmental pharmacokinetics with its merit and demerit.
- i) Define and Explain in short -MRT, AUC.
- j) Explain in detail Biopharmaceutics classification system.

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Total No. of Questions : 3]

SEAT No. :

PE4914

[Total No. of Pages : 2

[6569]-27

Third Year B. Pharmacy

BP 605 T : PHARMACEUTICAL BIOTECHNOLOGY

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

Q1) Objectives type (Any 5 out of 7) :

[5×3=15]

- a) Write in brief about genetic engineering.
- b) Explain in detailed PCR 139.
- c) Explain structure of Immunoglobulins.
- d) Brief on method of the preparation of antitoxins.
- e) Explain in detailed storage condition and stability of official vaccines.
- f) Brief on cellular immunity.
- g) Discuss method of preparation of bacterial vaccines.

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

[2×10=20]

- a) Describe how DNA technology is used. Describe how genetic engineering produces hormones Insulin.
- b) How does fermentation work? Explain the general requirements for fermentation and discuss how Vitamin B 12 is produced using fermentation technology.
- c) Discuss about the general process for making toxoids and bacterial vaccinations.
- d) What is a cloning vector? Discuss various types and features of cloning vectors.

P.T.O.

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

[8×5=40]

- a) Describe how biosensors are used in the pharmaceutical industry.
- b) Give principle and application of ELISA.
- c) Describe in detail processing and storage of whole human blood samples.
- d) Explain in detailed various methods of enzyme immobilization with its application.
- e) Make a note about hypersensitive reactions.
- f) Give principle and its application of Western blotting.
- g) Discuss the production of monoclonal antibodies using hybridoma technology.
- h) Describe microbial biotransformation and its application.
- i) Discuss production of Penicillins.
- j) Give the causes and types of Mutations.

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Total No. of Questions : 3]

SEAT No. :

PE-4915

[Total No. of Pages : 2

[6569]-28

Third Year B. Pharmacy

**BP-606T : PHARMACEUTICAL QUALITY ASSURANCE
(Rev. 2019 Pattern) (Semester - VI)**

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) Define training. State its importance in the pharmaceutical industry.
- b) Explain the importance of quality control parameters for rubber closures used in pharmaceutical packaging.
- c) Describe how waste disposal practices are applied in the pharmaceutical industry to ensure environmental safety and regulatory compliance
- d) What is the importance of calibration in pharmaceutical instruments?
- e) What is IQ, OQ, and PQ in pharmaceutical equipment qualification?
- f) Write down the benefits of ISO 9000 and ISO 14000
- g) Enlist ICH Quality guidelines.

Q2) Attempt any two of the following :

[20]

- a) Discuss in brief Good Warehousing Practices (GWP) in the pharmaceutical industry.
- b) Write down the guidelines for design, construction, and plant layout of sterile areas in the pharmaceutical industry.
- c) "Evaluate the importance of USFDA regulatory guidelines in maintaining the quality, safety, and efficacy of drugs during their development and approval"
- d) Explain the difference between Batch Manufacturing Record (BMR) and Master Formula Record (MFR) in pharmaceutical manufacturing.

P.T.O.

Q3) Attempt any eight of the following :

[8 × 5 = 40]

- a) Explain the major quality control tests for paperboards and cartons.
- b) Discuss the importance and responsibilities of Quality Assurance unit as per GLP guidelines
- c) Explain in brief the procedure for handling and evaluation of complaints about product quality in the pharmaceutical industry.
- d) What is SOP? Write down the guidelines for writing SOP and give a representative format for SOP.
- e) Enlist and explain the parameters considered for analytical method validation.
- f) Write short note on CPCSEA Guidelines.
- g) Comment on control of contamination in sterile manufacturing areas.
- h) Elaborate the types of validation.
- i) Write down the criteria for selection and purchase of equipment in the pharmaceutical industry
- j) What is Quality by Design (QbD)? Give an overview of QbD elements.



Total No. of Questions : 3]

SEAT No. :

PE4916

[Total No. of Pages : 2

[6569]-29

Fourth Year B.Pharmacy

BP 701T : INSTRUMENTAL METHODS OF ANALYSIS

(Revised 2019 Pattern) (Semester-VII)

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) Attempt any five.

[5×3=15]

- a) Explain.
 - i) Blue shift
 - ii) Red shift
 - iii) Hyperchromic effect
- b) Draw a neat schematic diagram of fluorimeter. Give Reason, the light source and detectors are placed perpendicular to each other in fluorimeter.
- c) Discuss importance of degassing in HPLC.
- d) Name the burners used in flame photometry and explain in detail any one.
- e) Write the difference between HPLC and TLC.
- f) What is fingerprint region in IR spectroscopy?
- g) Explain application of Gas Chromatography.

Q2) Attempt any two.

[2×10=20]

- a) Discuss the different pumps & detectors used in HPLC.
- b) Explain the basic principle of atomic spectroscopy. Give the differences between flame emission and atomic absorption spectroscopy.
- c) Write down the theory of fluorescence and phosphorescence spectroscopy.
- d) Discuss the components in instrumentation of UV-Visible Spectrophotometer. Explain in detail the detectors of UV visible spectroscopy.

P.T.O.

Q3) Attempt any eight.

[8×5=40]

- a) Draw a neat labelled instrumentation layout of IR spectrophotometer and explain the sample handling techniques in IR.
- b) Discuss the different types of interferences encountered in AAS and the ways to minimize them.
- c) State Beer-Lamberts law and derive an equation for it.
- d) Explain the concept of Plate Theory in chromatography.
- e) Write the construction and working of Flame Ionisation Detector and Electron Capture Detector.
- f) Explain principle involved in Flame Photometry. Name the fuel gases used in flame emission spectroscopy.
- g) Explain the different region observed in an IR spectrum with the help of neat labelled figure.
- h) Explain ion exchange chromatography.
- i) Explain the principle of Thin Layer Chromatography and add a note on its applications.
- j) Write a note on solvent effects in UV spectroscopy.



Total No. of Questions : 3]

SEAT No. :

PE4917

[Total No. of Pages : 2

[6569]-30

Fourth Year B. Pharmacy
BP702T : INDUSTRIAL PHARMACY - II
(Revised 2019 Pattern) (Semester - VII)

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) Explain role of ICH guidelines in technology transfer.
- b) Define clinical trial and explain phase I trials.
- c) Write about TIFAC.
- d) Enlist benefits of ISO 14000.
- e) What are the protocols for technology transfer?
- f) What are SUPAC guidelines?
- g) Explain process in fluidized bed granulator.

Q2) Answer the following: (Any 2)

[20]

- a) Explain unit processes in liquid dosage form manufacturing, equipments used scale up considerations.
- b) Explain scale up considerations in tablet coating.
- c) Elaborate on Total Quality Management (TQM) and Quality by Design (QbD).
- d) Explain elements of ISO 9000:2000.

P.T.O.

Q3) Answer the following: (Any 8)

[40]

- a) Write a note on technology transfer agencies in India.
- b) Explain concept of six sigma in Quality Improvement.
- c) Write a short note on various phases of clinical trials.
- d) Discuss about granularity of technology transfer process of API and excipients.
- e) Discuss about GLP.
- f) Explain scale up considerations in drying of granules.
- g) Elaborate on organization and responsibilities of CDSCO.
- h) What are the general considerations of Investigational New Drug Application (INDA).
- i) Explain scale up considerations in semi solids.
- j) Explain data presentation for FDA submissions.



Total No. of Questions : 3]

SEAT No. :

PE4918

[Total No. of Pages : 2

[6569]-31

Fourth Year B. Pharmacy
BP703T : PHARMACY PRACTICE
(Revised 2019 Pattern) (Semester - VII)

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 out of seven. [15]

- a) Explain the roles and responsibility of hospital pharmacist.
- b) What are the advantages and disadvantages of hospital pharmacy?
- c) Draw a typical layout of hospital pharmacy.
- d) Add a note on the implementation of budget preparation.
- e) What are the benefits of Patient counseling?
- f) Define ward round and its objectives.
- g) Mention the role of hospital pharmacist in the investigational use of drugs.

Q2) Solve any two out of four. [20]

- a) Define Therapeutic Drug Monitoring (TDM). Mention its objectives and explain the process involved in TDM.
- b) What is floor stock distribution of drugs in a hospital? Give its merits and demerits.
- c) Explain in detail the staff and Infrastructure Requirement for Community Pharmacy.
- d) Define hospital formulary and elaborate the stepwise procedure involved in the preparation of hospital formulary.

P.T.O.

Q3) Solve any eight out of ten.

[40]

- a) Explain the function of pharmacy and therapeutic committee?
- b) Explain the steps involved in the preparation of hospital formulary.
- c) Give a comprehensive note on factors affecting Therapeutic Drug Monitoring.
- d) Explain the Rational use of medicines.
- e) Enumerate on Pharmacokinetic Drug interactions.
- f) Mention the various laboratory blood tests. Explain their significance.
- g) Write the role of pharmacist in the education and training program.
- h) Define Inventory Control. Specify the methods involved in Inventory Control.
- i) Explain the role of a pharmacist in budget preparation and implementation.
- j) Explain in detail about the role of pharmacist in medication adherence.



Total No. of Questions : 3]

SEAT No. :

PE4919

[Total No. of Pages : 2

[6569]-32

Fourth Year B. Pharmacy

BP 704 - T : NOVEL DRUG DELIVERY SYSTEM

(2019 Pattern) (Semester - VII) (Revised)

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 indicate full marks.*

Q1) Objectives type Question (Any 5 out of 7) :

[5×3=15]

- a) What makes niosome different from liposome.
- b) Justify how solubility influences designing of CRDDS.
- c) Give suitable and unsuitable criteria for GRDDS.
- d) Write short note on non-erodible ocuserts.
- e) Describe biological factors affecting transdermal drug delivery.
- f) How drug release is calculated in reservoir system.
- g) Define nanoparticle along with types and goal of designing nanoparticles.

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

[2×10=20]

- a) Give detail account of basic components of Transdermal drug delivery system.
- b) Discuss physicochemical and biological factors affecting designing of CDDS.
- c) Describe Air-suspension method for the manufacturing of micro encapsulation.
- d) Describe the various method of preparation & application of monoclonal antibodies.

P.T.O.

Q3) Short Answers (Any 8 out of 10)

[8×5=40]

- a) Give objectives, ideal characteristics & drug delivery system along with drug release pattern of controlled release drug delivery.
- b) Explain about medicated IUD for controlled drug delivery system.
- c) Describe about monoclonal antibodies in targeted drug delivery system.
- d) Write note on various types of ocuserts.
- e) Give detailed classification & application of polymer in CDDS.
- f) What are benefits and drawbacks of an implantable drug delivery system.
- g) Explain formulation aspects of nasal spray.
- h) Describe mechanism & various theories of mucosal drug delivery system.
- i) Explain how the medicine is delivered via the skin using a transdermal drug delivery system.
- j) Describe evaluation for nanoparticles.

x x x

Total No. of Questions : 3]

SEAT No. :

PE-4920

[Total No. of Pages : 2

[6569]-33

Final Year B. Pharmacy

BP 801 T: Biostatistics and Research Methodology

(Rev. 2019 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 the following (Any Five) :

[15]

- a) Suggest steps for building a Pie Chart.
- b) What are cohort studies?
- c) What are the different ways to present data?
- d) What are the advantages of central composite design over factorial design?
- e) Enumerate the steps needed to condense raw data to grouped data.
- f) Write a note on “Random Sampling”.
- g) In a box, there are 8 Aspirin, 10 Analgin and 12 Paracetamol tablets. If one tablet is chosen at random, find the probability that: I. It is Aspirin and II. It is Paracetamol.

P.T.O.

Q2) Answer the following (Any Two) :

[20]

- a) What are clinical trials? Elaborate the phases of clinical trials.
- b) Explain experimental design and its types.
- c) What do you understand by measures of central tendency? Describe the types of measures and their characteristics.
- d) What is hypothesis testing? Explain in detail the procedure for hypothesis testing.

Q3) Answer the following (Any Eight) :

[40]

- a) Write a note on Plagiarism.
- b) Explain response surface plot and Contour Plot graphs.
- c) Write in brief about statistical analysis using Excel.
- d) What do you understand by research? What is the importance of research?
- e) Elaborate sample size determination.
- f) Write note on MINITAB®.
- g) What are the characteristics of good statistical measure? Write about standard deviation as the measure of dispersion.
- h) Write a note on 'Student's t test'.
- i) Find the mean, median and mode for the following data:
X: 60, 68, 60, 63, 62, 63, 60, 65, 69, 64, 68, 66.
- j) The class marks and their corresponding frequencies are given below:

Class mark: 33 35 39 38 36 31 32 37

Frequency: 1 2 5 8 14 6 3 1

Form a cumulative frequency table from the above data.



Total No. of Questions :3]

SEAT No. :

PE4921

[Total No. of Pages : 2

[6569]-34

Fourth Year B.Pharm.

BP-802 T : SOCIAL AND PREVENTIVE PHARMACY

(Revised 2019 Pattern) (Semester-VIII)

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 (05 out of 07)

[15]

- a) Explain socio-culture factor related to health and disease.
- b) Explain the importance of personal hygiene.
- c) What is cholera? Write measure for prevention of it.
- d) What is hypertension? Write the prevention and control of it.
- e) What are the objectives of national mental health programme?
- f) Describe the toxic effects of tobacco.
- g) Write a note on “Health promotion in schools”.

Q2) Answer any Two (02 out of 04)

[20]

- a) Explain in detail Integrated disease surveillance program (IDSP).
- b) What is Cancer? Write general principles of prevention and control of Cancer.
- c) What are the functions of Primary health centre? Discuss health promotion activities in school.
- d) Elaborate on need of nutrition and balanced diet. Explain the causes, and symptoms of malnutrition and its prevention.

P.T.O.

Q3) Answer any eight (08 out of 10)

[40]

- a) Discuss the causative factors, signs, symptoms, prevention and control of influenza.
- b) Write a note on National AIDS control programme.
- c) Discuss avoidable habits with reference to personal hygiene.
- d) Elaborate on National Malaria Prevention Program.
- e) Write general principles of prevention and control of Ebola.
- f) Explain the main causes of blindness. Discuss goals and objectives of National Programme for Control of Blindness and Visual Impairment.
- g) Define health. write a note on evaluation of public health.
- h) Explain in detail about modes of transmission, symptoms, prevention and control of Dengue.
- i) Give short note on drug addiction and drug substance abuse.
- j) Explain in detail about national rural health mission.



Total No. of Questions : 3]

SEAT No. :

PE4922

[Total No. of Pages : 2

[6569]-35

Fourth Year B.Pharmacy

BP803ET : PHARMA MARKETING MANAGEMENT

(Revised 2019 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) Write note on determinants of price
- b) Demonstrate the importance of vertical marketing
- c) Justify the key criteria's for selection of channel members
- d) Design the various tasks in physical distribution management.
- e) Evaluate the current trends in compensation of Professional sales representative
- f) Conclude the quantitative aspects of Pharmaceutical market
- g) Discuss in detail about global marketing of pharmaceutical product

Q2) Long Answer (Any 2 out of 4)

[2×10=20]

- a) Elaborate on Product line & Product mix decisions
- b) Explain in detail about methods & determinants of promotional mix
- c) Discuss in detail demographic descriptions & socio-psychological characteristics of consumer
- d) Demonstrate the journey of ordinary product to become a Brand

P.T.O.

Q3) Short Answers (Any 8 out of 10)

[8×5=40]

- a) Write a note on Industrial marketing.
- b) Discuss the prescribing habits of the physician.
- c) Generalize the statement that product positioning is important in Pharma marketing
- d) Discuss packaging & labelling decisions.
- e) Write down in detail about promotional budget
- f) Explain the various online promotional techniques for OTC Products.
- g) Classify the tasks in physical distribution management
- h) Describe the current selection & training process for (PSR) Professional sales representative
- i) Write about the marketing environment in pharmaceuticals
- j) Distinguish between vertical & horizontal marketing



Total No. of Questions : 3]

SEAT No. :

PE4923

[6569]-36

[Total No. of Pages : 2

Fourth Year B. Pharmacy

BP - 804 - ET : PHARMACEUTICAL REGULATORY SCIENCE

(Revised 2019 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 diagram wherever necessary.*

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

[15]

- a) Write a note on Purple book.
- b) Discuss structure and function of ethics committee.
- c) Discuss Basic terminologies in regulatory concept.
- d) Write a note on Phase II of Clinical trial.
- e) Write about Organogram of CDSCO.
- f) Differentiate between brand and generic products.
- g) Write a note on Drug Master Files (DMF).

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

[20]

- a) Explain the organization and functions of regulatory bodies of EU and Japan.
- b) Explain in detail development of clinical trial protocol.
- c) Explain in detail Managing and Monitoring clinical trials. Add a note on Pharmacovigilance.
- d) Explain the regulatory approval process for New Drug Application.

P.T.O.

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

[40]

- a) Write a note on Orange book.
- b) Summarize ASEAN Common Technical Document (ACTD) research.
- c) Explain the approval process for implementing the changes to an approved ANDA.
- d) Write a note on electronic Common Technical Document (e CTD).
- e) Write about the regulatory authorities of Australia.
- f) Write a note on Dossier Format.
- g) Discuss in detail about ICH Guidelines.
- h) Discuss Code of Federal Regulatory.
- i) Explain the roles and responsibilities of the regulatory authority
- j) Discuss on formation and working procedures for Independent Ethics committee.



Total No. of Questions : 3]

SEAT No. :

PE4924

[Total No. of Pages : 2

[6569]-37

Fourth Year B. Pharmacy
BP-805-ET : PHARMACOVIGILANCE
(Revised 2019 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.*

Q1) Solve any FIVE.

[5×3=15]

- a) Write about importance of safety monitoring.
- b) Define :
 - i) Pharmacovigilance
 - ii) Adverse reactions
- c) Write a note on Cross-sectional study.
- d) What is the role of post approval phase?
- e) Write significance of effective communication in Pharmacovigilance.
- f) Write the role of CDSCO.
- g) Explain in short - Management of adverse drug reactions.

Q2) Solve any TWO.

[2×10=20]

- a) Discuss in detail about Pharmacovigilance Program in India. (PvPI)
- b) Explain in detail - different Pharmacovigilance methods.
- c) Define vaccine, Write a detail note on vaccine Pharmacovigilance and adverse event following immunization.
- d) Classify ADR. Discuss in detail reporting and management of ADR along with causality assessment scales.

P.T.O.

Q3) Solve any EIGHT.

[8×5=40]

- a) Explain in detail Naranjo scale.
- b) Write a note on importance of safety monitoring of medicine.
- c) Write about MedDRA and standardized MedDRA.
- d) What are different information resource available in pharmacovigilance?
- e) Explain Schedule Y in detail.
- f) Write a detail note on Cohort study.
- g) Differentiate between Adverse event and adverse drug reaction and give classification of ADR.
- h) Explain difference in Indian and global Pharmacovigilance.
- i) Discuss International classification of diseases.
- j) Discuss in detail about ICH guidelines in Pharmacovigilance. (objectives and GCP)



Total No. of Questions : 3]

SEAT No. :

PE4925

[Total No. of Pages : 2

[6569]-38

Fourth Year B. Pharmacy

**BP 806ET : QUALITY CONTROL AND STANDARDIZATIONS
OF HERBALS**

(2019 Pattern) (Revised) (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) Solve the following. (Answer 5 out of 7).

[5×3=15]

- a) Discuss in brief different leaf constants.
- b) Write a note Good collection practices for medicinal plants.
- c) Write types of Chemical markers two with examples.
- d) Explain in short 'Stores' as per schedule T.
- e) Note on 'Swelling Index' as per WHO for quality control of crude drugs.
- f) Discuss application of TLC in standardization of herbal products.
- g) Brief note on American Herbal Pharmacopoeia.

Q2) Solve long answers (Answer 2 out of 4).

[2×10=20]

- a) Write a note on comparison of various Herbal Pharmacopoeias.
- b) Explain GMP requirements and Drugs & Cosmetics Act provisions.
- c) Discuss in detail list of recommended machinery, equipment and space requirement of premises required for manufacturing of herbal medicines as per schedule T.
- d) Elaborate HPTLC & HPLC application for standardization of herbals with examples.

P.T.O.

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

[8×5=40]

- a) Write in brief 'Reference substances' as per GLP.
- b) Explain in brief safety in laboratories as per GLP.
- c) Elaborate ICH guidelines for quality control of herbal drugs.
- d) Discuss cultivation parameter as per GAP for medicinal plants.
- e) Write in detail "water and volatile matter" as per WHO guideline for quality control of herbal drugs.
- f) Note on procedure for new drug application of herbals.
- g) Discuss microscopical evaluation of crude drugs.
- h) Write a note on determination of pesticide residues as per WHO guidelines.
- i) Explain WHO guidelines on safety monitoring of herbal medicines in pharmacovigilance systems.
- j) Write a note on post-harvest processing as per GACP.



Total No. of Questions :3]

SEAT No. :

PE4926

[Total No. of Pages : 2

[6569]-39

Fourth Year B. Pharmacy

COMPUTERAIDED DRUG DESIGN

(Revised 2019 Pattern) (Semester-VIII) (BP807ET)

Time :3 Hours]

[Max. Marks : 75

Instructions to the candidates:

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

Q1) Objective Type questions (Answer any 5 out of 7)

[5×3=15]

- a) Write a note on Taft steric constant.
- b) Compare SAR & QSAR
- c) Explain Bioisosterism. Classify with examples.
- d) Discuss the role of molecular and quantum mechanics in drug discovery.
- e) Write a note on chemoinformatics in the drug discovery process.
- f) Write a note on the drug bank.
- g) Write a note on design of HMG-CoA reductase inhibitors

Q2)Long Answer Questions (Answer any 2 out of 4)

[2×10=20]

- a) Explain concept drug discovery, drug design and drug development?
Explain various steps and approaches to lead discovery.
- b) Discuss classical & non-classical bioisosteric replacement strategies in Analogue based design of drugs with examples.
- c) What is QSAR? Explain in detail the history and development of QSAR
Explain the Hansch analysis and Free Wilson analysis and the relationship between them.
- d) Describe in detail Ligand structure based drug design by taking suitable example.

P.T.O.

Q3) Short Answer Questions (Answer any 8 out of 10)

[8×5=40]

- a) What is meant by drug likeness? Explain the process of drug -likeness screening
- b) Explain different methods for the energy minimization
- c) Elaborate COMFA & COMSIA.
- d) Discuss bioisosteric replacement strategy with one case study
- e) Write a note on databases used in bioinformatics.
- f) Explain design of H₂ Histamine antagonists
- g) Explain Global conformational minima determination
- h) Define the term pharmacophore. Explain about the pharmacophore mapping suitable example.
- i) Explain significance of Hammett's Substituent constant in QSAR
- j) Elaborate various databases used in drug design & discovery



Total No. of Questions :3]

SEAT No. :

[Total No. of Pages : 2

PE4927

[6569]-40

Fourth Year B.Pharmacy

BP 808 ET CELL AND MOLECULAR BIOLOGY

(Revised) (Semester-VIII) (2019 Pattern)

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 diagrams wherever necessary.*

Q1) Attempt any FIVE

[15]

- a) Define molecular biology.
- b) Define mutation.
- c) Define catabolism.
- d) State properties of the cell membrane.
- e) Define cell adaptation.
- f) Give significance of protein synthesis.
- g) What is the function of protein kinase enzyme?

Q2) Attempt any TWO

[20]

- a) Explain the transducer mechanism of GPCR.
- b) Describe different steps involved in translation.
- c) Explain cell signaling with one example.
- d) Explain cell death-events, regulators, and pathways.

P.T.O.

Q3) Attempt any EIGHT

[40]

- a) Enlist eukaryotic cell organelles and their functions.
- b) Explain different checkpoints in the cell cycle.
- c) Describe the process of meiosis.
- d) Explain necrosis and apoptosis mechanisms.
- e) Describe types of receptors and explain one associated pathway.
- f) Explain genomic and transgenic approaches used in molecular biology.
- g) Explain the role of secondary messengers in signaling pathways.
- h) Write a note on regularities in protein synthesis.
- i) Explain gene expression control mechanisms.
- j) Describe mechanisms of DNA transcription.



Total No. of Questions : 3]

SEAT No. :

PE4928

[Total No. of Pages : 2

[6569]-41

Fourth Year B. Pharmacy

BP 809 ET : COSMETIC SCIENCE

(Revised 2019 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) Attempt any Five of the following (Any 5)

[5×3=15]

- a) Describe different types of blemishes and wrinkles.
- b) Write the evaluation test for tensile strength of hair.
- c) Discuss the formulations of Hair conditioners.
- d) Explain the evaluation tests of antidandruff shampoo.
- e) Comment on formulation aspects of hair dyes.
- f) Differentiate between cold cream and vanishing cream.
- g) Write down the formulation consideration of tooth paste for bleeding gums.

Q2) Attempt any Two of the following (Any 2)

[2×10=20]

- a) Discuss various skin products used in cosmetics. Add a note on sensitivity testing.
- b) What do you mean by an antiperspirant? What are its actives? Explain its mechanism of action.
- c) Explain various hair cleaning preparations. Add a note on hair dyes.
- d) Discuss the classification, formulation and evaluation tests of sunscreens.

P.T.O.

Q3) Attempt any Eight of the following (Any 8)

[8×5=40]

- a) Write in short about BIS specification.
- b) Write in detail the formulation of Deodorants.
- c) Write down the Classification of Sunscreens and SPF.
- d) Explain the principle and mechanism of corneometer?
- e) Write in brief about formulation of hair conditioners.
- f) Discuss the formulation of Hair oils.
- g) Write a note on soap and syndet bars.
- h) What are humectants? Write down its classification with examples.
- i) Give the classification preservatives with examples.
- j) Demonstrate the evaluation tests for vanishing cream.

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Total No. of Questions : 3]

SEAT No. :

PE-4929

[Total No. of Pages : 2

[6569]-42
F.Y. B. Pharmacy
BP810ET : EXPERIMENTAL PHARMACOLOGY
(Revised 2019) (Semester - VIII)

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) Solve Any five out of Seven

[15]

- a) Write short note on euthanasia.
- b) Give importance of sham negative and positive control groups.
- c) What is research hypothesis?
- d) Write applications of different species and strains of animals.
- e) Illustrate the principle of actophotometer apparatus in determination of CNS activity.
- f) Elucidate 3 'R' principles of CPCSEA.
- g) Discuss rationale for selection of animal species and sex for research study.

Q2) Solve any Two out of four

[20]

- a) Discuss the evaluation of anti-diabetic activity in laboratory animals.
- b) Explain preclinical screening animal models for analgesic and anti-inflammatory drugs.
- c) Discuss preclinical screening animal models for sympathomimetic drugs.
- d) Discuss importance of Research methodology in research. Explain bio-statistics interpretation using Students 't' test and One -way ANOVA.

P.T.O.

Q3) Solve Any Eight out of Ten

[40]

- a) Discuss Preclinical screening for anti-ulcer agents.
- b) Explain CPCSEA guidelines for laboratory animals.
- c) Discuss preclinical screening animal models for anticancer drugs.
- d) Enumerate the models used for inducing dyslipidemia. Discuss in brief Triton induced model.
- e) Enlist the methods and discuss any one method for evaluation of skeletal muscle relaxant activity.
- f) Enlist the models used for Antiparkinson activity. Discuss in detail any one.
- g) Elaborate preclinical screening of anti-arrythmic activity.
- h) Discuss screening animal models for local anaethetics.
- i) Explain importance of hypothesis and review of literature.
- j) Explain screening models for coagulants and anticoagulants.



Total No. of Questions : 3]

SEAT No. :

PE4930

[Total No. of Pages : 2

[6569]-43

Fourth Year B. Pharmacy

BP 811 ET : ADVANCED INSTRUMENTATION TECHNIQUES

(Revised 2019 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) Explain in brief about X-ray monochromators.
- b) Explain principle of isoelectric focusing.
- c) Explain the terms 'shielding' and 'de shielding' with reference to Proton NMR.
- d) How the parameter 'Control of Wavelength' is calibrated for UV spectrophotometer?
- e) How the 'Injection Volume Accuracy' in HPLC is evaluated?
- f) Write in brief about Solvents used for Proton NMR.
- g) What is the difference Between TGA, DTA and DSC?

Q2) Answer following questions in detail. (Any Two)

[20]

- a) Elaborate on various parameters for calibration of HPLC System.
- b) Suggest suitable chemical structure for following spectroscopic data :
Molecular Formula C_8H_9NO .
IR : 3300 cm^{-1} , 3000 cm^{-1} , 1680 cm^{-1} , 1600 cm^{-1} , 1450 cm^{-1}
Proton NMR : δ 7.2 (m, 5H), 7.79 (s, 1H), 2.18 (s, 3H)
Mass (m/z) : 135, 77
- c) Write in detail about instrumentation for X-Ray Diffraction technique.
- d) Give an exhaustive account of Solid Phase Extraction.

P.T.O.

Q3) Write short notes on following. (Any Eight)

[40]

- a) Fast Atom Bombardment
- b) Faraday cup
- c) Paper Electrophoresis
- d) Procedure for RIA
- e) Calibration of Electronic Balance
- f) Liquid-Liquid Extraction
- g) Electron Impact Ionization
- h) DTA
- i) MS-MS
- j) Calibration of Fluorimeter

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Total No. of Questions : 3]

SEAT No. :

PE-4931

[Total No. of Pages : 2

[6569]-44

F.Y. B. Pharmacy

BP-812-ET : DIETARY SUPPLEMENTS AND NUTRACEUTICALS
(Revised 2019 Pattern) (Semester - VIII)

Time : 3 Hours]

[Max. Marks : 75

Instructions to the candidates :

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

Q1) Objectives type (Any 5 out of 7) :

[5 × 3 = 15]

- a) Write the uses of sea foods as functional food.
- b) Give health benefits of sulphides.
- c) Discuss need and essential features of FPO.
- d) List the several kinds of common food adulterants.
- e) Role of prebiotics in digestive health.
- f) Define Functional foods.
- g) Give the biological source, phytoconstituents and health benefits of Flaxseeds.

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

[2 × 10 = 20]

- a) Describe in detail how free radicals affect brain pathology and metabolism. Discuss the function of catalase and superoxide dismutase in controlling free radicals.
- b) Describe the role that nutrition plays in public health. Discuss the origins, chemistry, therapeutic uses, and health advantages of Gingko and Spirulina,.
- c) Explain in detail about the source, chemistry and medicinal benefits of any two Carotenoids.
- d) Explain in detailed Dietary fibers and complex carbohydrates as functional food ingredients.

P.T.O.

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

[8 × 5 = 40]

- a) Give the biological source, phytoconstituents and health benefits of Ginseng.
- b) Explain in detail how muscle damage is caused by free radicals.
- c) Explain in detail the damaging effects of free radicals on lipids.
- d) Describe the function of regulatory bodies in preserving food product safety and preventing adulteration.
- e) Discuss processing, storage and interaction of various environmental factors on the potential of nutraceuticals.
- f) Write a note on the health benefits of anthocynidins.
- g) Explain occurrence and health benefits of tocopherols.
- h) Role of free radicals in inflammatory diseases.
- i) Give health benefits of any two Flavonoids.
- j) Discuss need and essential features of HACCP.



Total No. of Questions : 3]

SEAT No. :

PE-12075

[Total No. of Pages : 2

[6569]-51

S.Y. B.Pharmacy

BP-302T : PHYSICAL PHARMACEUTICS - I

(Rev. 2019) (Semester - III) (Revised)

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 suitable diagrams wherever necessary.
- 4) Do not write anything on question paper except seat number.

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

[5 × 3 = 15]

- a) Define aerosol. Explain in detail Principle, classification, types, advantages, and disadvantages of aerosols.
- b) Compare polymorphism & pseudopolymorphism. Explain the different types of Polymorphism.
- c) Write significance of complexes? Outline methods used in complex analysis.
- d) Summarize HLB values using suitable diagram, mentioning their significance.
- e) Name pharmaceutical applications of phase diagram of three component systems.
- f) Explicate the significance of Vander Waal's constants for real gases.
- g) State and explain Bragg's equation.

P.T.O.

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

[2 × 10 = 20]

- a) Compare capillary rise method and drop pipette method for the determination of surface tension. Add a note on the spreading coefficient.
- b) Derive equation of surface free energy for rectangular and curved surface
- c) Define solubility. Recall various factors affecting the solubility of drugs in solids, liquids & gases.
- d) Define and derive Raoult's law. Explain in detail the positive and negative deviations of Raoult's law along with its applications and limitations.

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

[8 × 5 = 40]

- a) Elaborate BCS classification system and add note on methods to determine solubility and Permeability.
- b) Summarize, the concept of Pharmaceutical & biological buffers.
- c) Illustrate in details about Glass transition temperature.
- d) Compile a brief note on Adsorption isotherms.
- e) Explain Protein binding
- f) Demonstrate the concept "Solute-solvent interactions."
- g) List the steps involved in determination of surface tension using Du-Nouy ring method.
- h) Enlist factors affecting the solubility of gases in liquids.
- i) Elaborate on colligative properties.
- j) State & explain Nernst Distribution Law along with its limitations.



Total No. of Questions : 3]

SEAT No. :

PE-12243

[Total No. of Pages : 2

[6569]-51-CR
S.Y. B. Pharmacy
BP-302-T : PHYSICAL PHARMACEUTICS - I
(Rev. 2019) (Semester - III)

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 suitable diagram wherever necessary.*
- 4) Do not write anything on question paper except seat number.*

Q1) Objective Type Questions (Answer 5 out of 7) : **[5 × 3 = 15]**

- a) Define refractive index and state its pharmaceutical applications.
- b) Define vapour pressure and state its importance in pharmaceutical systems.
- c) Define surface tension and distinguish it from interfacial tension.
- d) State any two pharmaceutical applications of complexation.
- e) Describe the concept of ideal solubility parameter and its significance.
- f) Define eutectic mixtures and state their pharmaceutical relevance.
- g) What are crystalline complexes? Give one example.

Q2) Long Answer Questions (Answer 2 out of 4) : **[2 × 10 = 20]**

- a) Explain ideal and real solutions with reference to Raoult's law and discuss their pharmaceutical significance.
- b) Explain the properties of gases, including liquefaction of gases, and evaluate their application in aerosols and inhalers.
- c) Explain Sorensen's pH scale, buffer equation and buffer capacity, and discuss the preparation and applications of buffered isotonic solutions.
- d) Explain polymorphism, its different forms, and discuss its pharmaceutical applications and detection techniques.

P.T.O.

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

[8 × 5 = 40]

- a) Discuss the solubility of gases in liquids and analyze the effect of temperature and pressure.
- b) Explain and apply the distribution law in pharmaceutical systems, highlighting its applications.
- c) Explain the principle of X-ray diffraction and interpret the significance of Bragg's equation in crystal analysis.
- d) Explain the concept of the glassy state and discuss its relevance in pharmaceutical formulations
- e) Explain the principle of surface-active agents and analyze the significance of the HLB scale.
- f) Explain and apply the concepts of solubilisation and detergency in Pharmaceutical systems.
- g) Explain the classification of complexation with suitable examples.
- h) Describe the methods used for analysis of complexes in pharmacy.
- i) Explain the buffer equation with a suitable example.
- j) Explain the concept of buffer capacity and the factors affecting it.



Total No. of Questions : 3]

SEAT No. :

PE-12076

[Total No. of Pages : 2

[6569]-52

S. Y. B. Pharmacy

BP-303T : PHARMACEUTICAL MICROBIOLOGY

(Rev. 2019 Pattern) (Semester - III)

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 (Any five) :

[5 × 3 = 15]

- a) Explain the principle and importance of phase contrast Microscopy.
- b) Differentiate between bacteria and fungi.
- c) What is Koch postulates?
- d) Write the classification of bacteria depending on the arrangement of flagella with suitable examples.
- e) Explain the principle and importance of Gram staining.
- f) What is transformed cell cultures? Explain.
- g) Explain :
 - i) Z-value
 - ii) HEPA filter.

Q2) Answer the following (Any Two) :

[2 × 10 = 20]

- a) Nutrient agar is the common medium in the laboratory comment. Explain different types of media used for microbial growth.
- b) What is Microbiological assays? Explain in detail assay of antibiotics by turbidimetric method.
- c) How will you detect microbial contamination and spoilage in pharamaceuticals.
- d) What is disinfectant? Explain in detail the classification of disinfectants with mechanism of action and applications.

P.T.O.

Q3) Answer the following (Any Eight) :

[8 × 5 = 40]

- a) Write the importance and scope of microbiology in the field of pharmacy.
- b) Explain different media used for growth of animal cells.
- c) Explain in detail growth curve of bacteria.
- d) Write a note on structure of viruses?
- e) What are the main sources of contamination of an aseptic area? How will you prevent it?
- f) Explain in detail gaseous sterilization.
- g) Explain different methods used for sterility testing.
- h) How will you evaluate microbial stability of formulation?
- i) Explain detail morphological classification of fungi.
- j) Write a note on Hot air oven.



Total No. of Questions : 3]

SEAT No. :

PE-12077

[Total No. of Pages : 2

[6569]-53

S.Y. B. Pharmacy

BP-304-T : PHARMACEUTICAL ENGINEERING

(Rev. 2019) (Semester - III)

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 of the following :

[15]

- a) What is corrosion? Give methods to prevent corrosion.
- b) Explain distillation under reduced pressure with its application.
- c) Explain in short various factors affecting rate of filtration.
- d) What is equilibrium moisture content? State its application.
- e) State the application of centrifugation.
- f) State the application and factors influencing rate of evaporation.
- g) Explain in short heat transfer mechanism.

Q2) Attempt any Two of the following :

[20]

- a) Explain the construction, working & applications of multiple effect evaporator with diagram.
- b) Explain in detail : Ball mill.
- c) Describe Bernoulli's theorem with it's applications.
- d) Explain the objectives, mechanism & factors affecting size reduction.

P.T.O.

Q3) Attempt any Eight of the following :

[40]

- a) Explain the principle, construction & working of sieve Shaker.
- b) Explain the principle, construction working, uses and application of perforated basket centrifuge.
- c) Explain in detail the fluid energy mill.
- d) Describe about the material handling system in corrosion.
- e) Explain about the planetary mixer.
- f) Define mixing : What are it's objectives? Discuss factors affecting mixing.
- g) Define drying : Explain objectives of drying with suitable examples. Add a note on phases of drying curve.
- h) Classify the types of corrosion. Explain the theories of corrosion on single metal and different metal.
- i) Write principle, construction, working, advantages and disadvantages of horizontal tube evaporator.
- j) Write the mechanism of solid-solid mixing and solid-liquid mixing.



Total No. of Questions : 3]

SEAT No. :

PE-12078

[Total No. of Pages : 3

[6569]-54

Second Year B. Pharmacy (Revised)
BP-301T : PHARMACEUTICAL ORGANIC
CHEMISTRY - II
(2019 Pattern) (Semester - III) (Theory)

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) Describe the Hinsberg test and explain its significance in distinguishing primary, secondary and tertiary amines.
- b) Explain why phenols are less acidic than carboxylic acids.
- c) Discuss the rotational axis of symmetry and its role in optical activity.
- d) Elaborate on the reactions of cyclopropane and cyclobutane with suitable examples.
- e) Define and differentiate enantiomers, diastereomers, and meso compounds with appropriate examples.
- f) Write the reactions and medicinal applications of phenanthrene.
- g) Choose the correct option for the following:
 - i) Which of the following compounds is aromatic?
 - A) Piperidine,
 - B) Cyclohexanone oxime,
 - C) Pyrrole,
 - D) 1,3-Cyclohexadiene
 - ii) Which of the following substituents is Ortho/ Para-directing in electrophilic substitution?
 - A) $-\text{SO}_3\text{H}$
 - B) $-\text{CHO}$
 - C) $-\text{Cl}$
 - D) CN

P.T.O.

iii) Nitration of toluene predominantly yields one of the following:

- A) o- and p-nitrotoluene
- B) trinitrotoluene
- C) meta-dinitrotoluene
- D) m-nitrotoluene

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

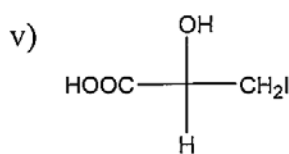
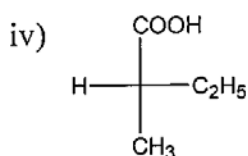
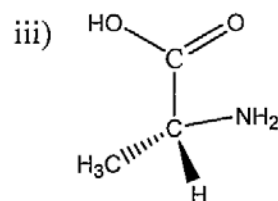
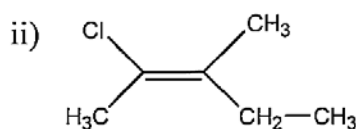
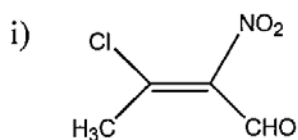
[2 × 10 = 20]

- a) Explain the methods of preparation, chemical reactions and medicinal uses of anthracene and its derivatives.
- b) Explain the effect of substituents on the reactivity and orientation of monosubstituted benzene compounds towards electrophilic substitution reactions.
- c) Discuss in detail the various methods used to determine the configuration of geometrical isomers, highlighting the principles and examples of each method.
- d) Explain Bayers strain theory and Sachse-Mohr theory of cycloalkanes.

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

[8 × 5 = 40]

- a) Explain the Electrophilic Substitution Reactions of Benzene with suitable examples and mechanism.
- b) Discuss the Acidity of Phenols and describe the effect of substituents on their acidity.
- c) Describe the synthesis of Aniline using the Hofmann Rearrangement reaction and outline its mechanism.
- d) Assign the configurations to the following compounds:



- e) Discuss Coulson and Moffitt's modification in the structure of cyclopropane
- f) Explain the concept of Aromaticity in Heterocyclic Compounds with suitable examples.
- g) Write a short note on the Basicity of Aromatic Amines and explain the effect of substituents on their basicity.
- h) Describe Sandmeyer's Reaction and discuss its mechanism and applications.
- i) Define Rancidification. Explain the process and preventive measures to avoid rancidification of fats and oils.
- j) Explain how to specify the relative configuration of optical isomers using the D and L system of nomenclature.

