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List of Tutorials (S. Y. B. Pharmacy)

Academic Year 2022-23

BP101T Human Anatomy and Physiology I– Theory

Tutorial number	Tutorial Questions	
	A Division (PSB)	B Division (PSB)
1	Describe in detail about structural organization of body systems	Describe in detail about structural organization of body systems
2	Write in detail about homeostasis	Write in detail about homeostasis
3	Draw a well labelled diagram of cell and describe its organelle in detail	Draw a well labelled diagram of cell and describe its organelle in detail
4	Describe internal structure of heart and discuss its anatomy and physiology	Describe internal structure of heart and discuss its anatomy and physiology
5	Explain conduction system of heart	Explain conduction system of heart
6	Describe in short blood circulation and its types	Describe in short blood circulation and its types
7	Draw a well labelled diagram of lymph node and discuss its anatomy and physiology	Draw a well labelled diagram of lymph node and discuss its anatomy and physiology
8	Explain in detail about blood grouping	Explain in detail about blood grouping
9	Discuss anatomy and physiology of cranial nerves	Discuss anatomy and physiology of cranial nerves
10	Differentiate between sympathetic and parasympathetic system	Differentiate between sympathetic and parasympathetic system
11	List out names and locations of cranial nerves	List out names and locations of cranial nerves
12	Discuss anatomy and physiology of skin as sensory organ	Discuss anatomy and physiology of skin as sensory organ
13	Discuss in detail synovial joints along with its types	Discuss in detail synovial joints along with its types
14	Describe physiology of muscle contraction	Describe physiology of muscle contraction
15	Discuss disorders of heart	Discuss disorders of heart



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713	28/3/23	Discuss in detail synovial joints along with their types.	28 - 29
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Tutorial No. 1

1] Describe in detail about levels of structural organization of body system.

Structural Organization

Human bodies are layered structurally and functionally on an increasing scale of complexity.

They are given as :-

1. P. Cells :- Organisms are built of functional and structural units called cells. Although human cells come in many shapes and sizes, they all share certain similarities.

2. P. Tissues :- It is defined as the collection of similar cells that perform the same functions and share the same structure.

Tissues fall into four categories:

- Epithelial tissues
- Connective tissues
- Nervous tissues
- Muscular tissue.



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3.0 Organs :— In the human body, organs are tissues arranged precisely to perform specific tasks. Example: lungs, liver, kidneys, etc. Epithelial tissues on surface tissues are responsible for absorption in the kidneys.

4.0 Organ systems / Human body systems :— In organ systems, several organs work together to accomplish some task. Example:— The excretory system, lymphatic system etc. There are 11 types of organ systems in the human body which includes :—

- a] Integumentary system : It acts as a barrier against pathogens and chemicals. Organs in this system are: skin and subcutaneous tissue.
- b] Skeletal system : The red bone marrow and internal organs are protected by this system. It includes: bones and ligaments.
- c] Muscular system : This makes the skeleton move. It is responsible for heat production of the body. Organs in this system are: muscles and tendons.

d] Nervous system : Sensory information is interpreted through the nervous system. The organs in this system are: brain, eyes, nerves, ears.

e] Endocrine system : Several body functions are controlled by this hormone, including growth and reproduction. The organs in this system are: pancreas, pituitary gland, thyroid glands.

f] Circulatory system : Further more it removed waste products from tissues as well as providing oxygen and nutrients. The organs in this system are: Heart, blood & arteries.

g] Respiratory system : During breathing oxygen is exchanged with carbon dioxide from the blood. The organs in this system are: lungs, trachea, larynx and diaphragm.

h] Lymphatic system : The process of returning tissue fluid to the blood takes place through this system. Organs included are: spleen and lymph nodes.



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i] Digestive system is a simple chemical process that converts food into simple chemicals that can be absorbed and utilized by the body. Organs in this system: Stomach, Colon, liver, pancreas.

j] Urinary system is it helps in getting rid of waste products in the blood. The organs in this system are: Lungs, urinary bladder, kidneys.

k] Reproductive system is the production of eggs or sperm takes place in the reproductive system. The organs in this system are: Female - Ovaries & uterus, Male - Testes, prostate gland.

Tutorial No. 2

e] Write in detail about homeostasis.

• It is the ability of a body or a cell to maintain a condition of equilibrium within its internal environment when dealing with external changes.

• Homeostasis is a dynamic condition.

• The conditions such as water balance, body temperature, blood sugar levels and pH of blood need to be maintained constant in order to set the different physiological process to occur.

• Causes of Homeostasis :-

(a) The body undergoes constant change as a result of which there is a shift in the equilibrium.

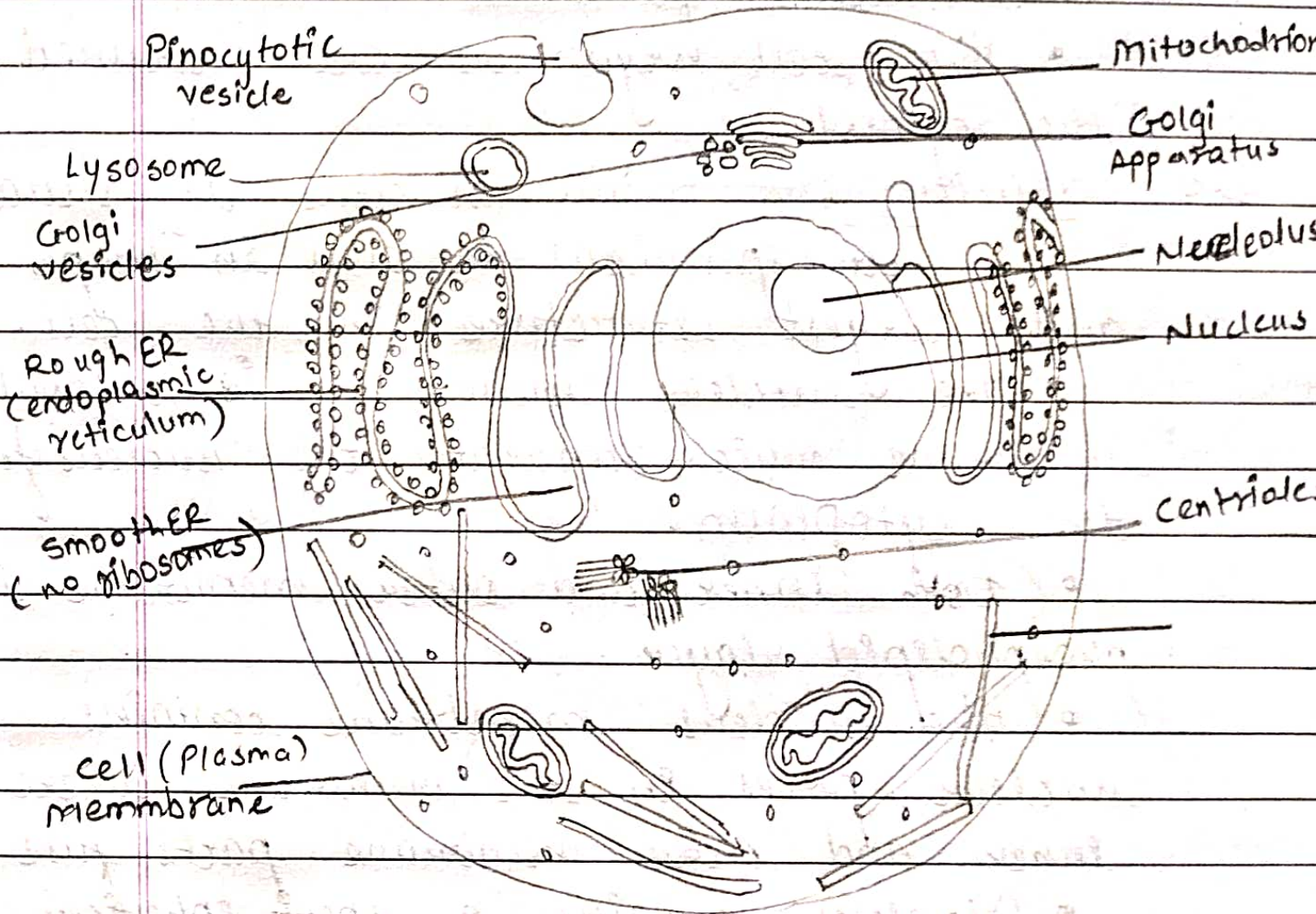
(b) Some disruptions come from the external environment in the form of the intake of heat, lack of enough oxygen or fall in blood glucose level after skipping breakfast.

(c) It may also occur due to physiological stresses as demand of work and school.

(d) In most cases, the disruption of homeostasis is mild and temporary and

Tutorial NO. 3

8] Draw a well labelled diagram of cell and describe its organelles.



1.10 Cytoplasm : — The gel like substance enclosed within the plasma membrane and present external to the nucleus is called cytoplasm.



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BP102T Pharmaceutical Analysis I – Theory

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Pharmaceutical analysis scope and application	Pharmaceutical analysis scope and application
2	Methods of expressing concentration	Methods of expressing concentration
3	Primary and secondary standards	Primary and secondary standards
4	Errors, accuracy and precision	Errors, accuracy and precision
5	Pharmacopoeia , impurities and limit test	Pharmacopoeia , impurities and limit test
6	Theories of acid-base titration	Theories of acid-base titration
7	Indicators and theories of indicators with neutralisation curve	Indicators and theories of indicators with neutralisation curve
8	Non-aqueous titration	Non-aqueous titration
9	Precipitation titration	Precipitation titration
10	Complexometric titration	Complexometric titration
11	Gravimetric titration	Gravimetric titration
12	Diazotization titration	Diazotization titration
13	Types of redox titration with principle and application	Types of redox titration with principle and application
14	Conductivity of cell and conductometry with application note on reference and indicator electrode of potentiometer.	Conductivity of cell and conductometry with application note on reference and indicator electrode of potentiometer.
15	Ilkonic equation with construction and working of dropping mercury electrode and rotating platinum electrode	Ilkonic equation with construction and working of dropping mercury electrode and rotating platinum electrode

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BP103T Pharmaceutics I – Theory

Tutorial number	A & B Division
1	Classification of dosage forms
2	Definition of various dosage forms
3	Definition of various dosage forms
4	Definition of various dosage forms
5	Definition of various dosage forms
6	Definition of various dosage forms
7	Differentiate between o/w and w/o emulsions
8	Write in short about ORS powder.
9	What do you mean by displacement value?
10	Give the formulae in posology
11	Write in short about geometric dilutions.
12	Give a model prescription.
13	Give the formula for the preparation of Paracetamol pediatric elixir.
14	Advantages of suspensions
15	Advantages of suppositories

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BP104T Pharmaceutical Inorganic Chemistry – Theory

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Explain in detail limit test of Arsenic.	History of Indian pharmacopeia
2	Define Impurity, give its sources, give principle and reaction for limit test for chloride	Define impurity and their sources give detail about limit test of arsenic
3	Define buffer solution, classify them and give ideal requirements of buffers.	Theories of acid and bases
4	Give role of major extra and intracellular electrolyte with examples, give composition of ORS.	Buffer equation and buffer capacity
5	Define antacids. Give ideal requirements of antacids.	Method of measurement of tonicity
6	Classify in detail GIT agent.	Electrolyte replacement theory and function of sodium and chloride
7	State and Explain methods for adjustment of tonicity.	Dental products, fluorides and dental carries
8	Classify antimicrobials based on their mode of action.	Antacids and their ideal properties
9	Discuss the principle, reaction and assay procedure for calcium gluconate.	Combination of antacids

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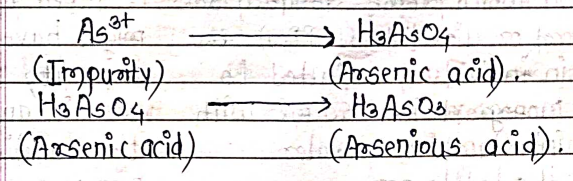
Tutorial No. 1

1. Explain in detail limit test of arsenic.

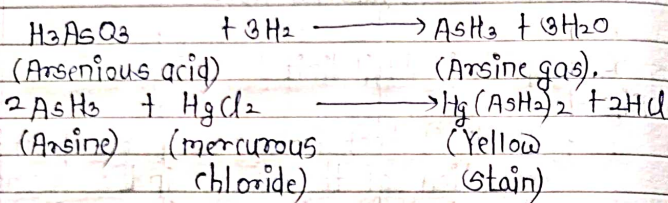
Ans:-

The limit test for arsenic is based on the reduction of the arsenic in the arsenious (state to the arsine gas (AsH_3) with zinc and hydrochloric acid. The arsine gas (AsH_3) stains the mercuric chloride paper yellow.

The sample is dissolved in acid where by the arsenic present as impurity in the sample gets converted into the arsenic acid. The arsenic acid reduced to arsenious acid reducing agents like stannous acid to potassium iodide etc. The nascent hydrogen formed during reaction further reduces arsenious acid to the arsine gas. The arsine gas reacts with mercuric chloride paper to produce yellow stain.



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The depth of yellow stain depends upon the amount of arsenic in the sample which is compared with that of standard stain produced from a known amount of arsenic. The limit test for arsenic is performed in gutzzeit apparatus.

* Procedure as below:-

Sr. No.	Test Sample	Standard Solution	Reasons.
1]	The test solution which prepared or directed in individual monograph is introduced into the bottle or	1 ml of Arsenic standard sol ⁿ (10 ppm) are diluted to 50 ml with water.	Suspected sample is taken which might have an impurity of arsenic and make it's solution as per monograph.

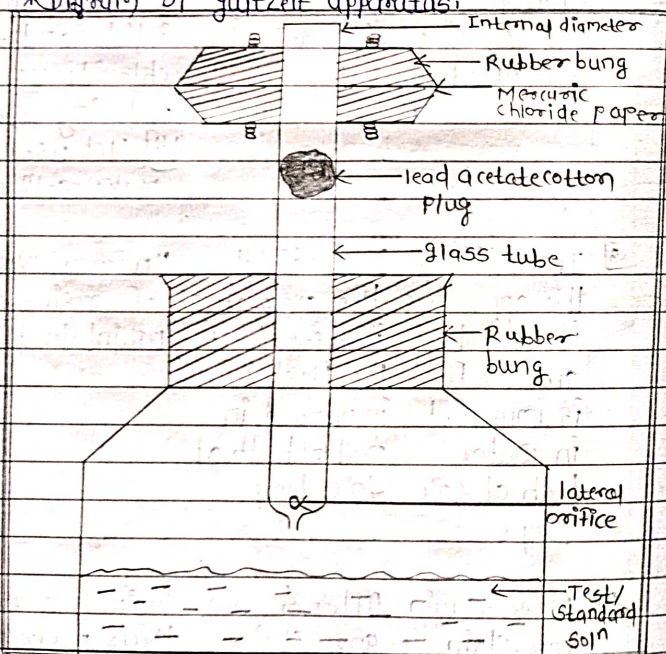
	conical flask.		
2]	5 ml of 1M potassium iodide, 5 ml of stannous hydrochloric solution AST and 10g zinc AST added.	5 ml of 1M potassium iodide, 5 ml of stannous HCl solution AST and 10g zinc AST added.	i] Stannous chloride is used for complete evolution of arsine gas. ii] Zinc, potassium iodide and stannous chloride used as reducing agent. iii] HCl used to make sol ⁿ acidic
3]	Immediately the apparatus is assembled and the flask is immersed in water bath at 40°C temp.	Immediately the apparatus is assembled the flask is immersed in water bath at 40°C temp.	Uniform evolution of arsine gas is maintained at 40°C.
4]	After 40 min any stain	After 40 min any stain	Arsine gas react with HgCl ₂ paper and



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produced on the mercuric chloride ($HgCl_2$) is observed.	produced on the mercuric chloride ($HgCl_2$)	make yellow stain (compare the intensity of yellow colour in both).
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*Diagram of gutzzeit apparatus:-



Tutorial No:- 2

2. Define impurity, give its sources, give principle and reaction for limit test for chloride.

Ans:-

*Impurity:-

It is the undesirable foreign material which may be toxic or non-toxic which is present in drug/substance.

*Sources of impurities:-

- i] Raw material
- ii] Reagents used in manufacturing process.
- iii] Intermediate products in manufacturing process.
- iv] Defects in manufacturing process.
- v] Solvents.
- vi] Action of solvent and reagent on reaction vessel.
- vii] Atmospheric contamination during manufacturing process.
- viii] Defective storage of final products.
- ix] Adulteration.



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i] Raw material:-

When substances or chemicals are manufactured, the raw materials from which these are prepared may contain impurities which get incorporated into final product.

Example:- Sodium chloride prepared from rock salt contains traces of Ca & Mg compounds.

ii] Action of solvents and reagents on reaction vessel:-

- Synthesis of drug involves many chemical reactions like nitration, halogenation, oxidation and hydrolysis. Different chemicals & solvents are used in these chemical processes:

- When chemical reactions are carried out in reaction vessel, the material of these vessel (Iron, tin, copper, aluminium, etc) is reacted upon by the solvents, chemicals & reaction products are formed.

iii] Reagents used in manufacturing process:-

- Reagents used in the manufacturing process are not completely removed by washing, these may find entry into the final products.

E.g:- Ammoniated mercury may be prepared by adding a solution of mercuric chloride to dilute ammonia solution.

iv] Defects in the manufacturing process:-

- Defects such as imperfect mixing, incompleteness of reaction, non adherence to proper temperature, pressure, pH or reaction condition, etc may result in the production of chemical compounds with impurities in them.

v] Intermediate products in the manufacturing process:-

There are some intermediates which are produced during the manufacturing process. Sometimes these intermediates may be carried through to the final product as impurity.

vi] Storage condition:-

- The chemical when prepared is stored in different types of containers
- Various types of materials are used for storage purpose. Reaction of substance with material of the storage vessel may take place



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BP203T Biochemistry – Theory

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	A Division	B Division
1	Biomolecules	Biomolecules
2	Bioenergetics	Bioenergetics
3	Glycolysis and citric acid cycle	Glycolysis and citric acid cycle
4	HMP shunt and glycogen metabolic pathways	HMP shunt and glycogen metabolic pathways
5	Oxidation phosphorylation and electron transport chain	Oxidation phosphorylation and electron transport chain
6	Oxidation of fatty acids	Oxidation of fatty acids
7	Formation and utilization of ketone bodies	Formation and utilization of ketone bodies
8	Cholesterol biosynthesis and disorders of lipid metabolism	Cholesterol biosynthesis and disorders of lipid metabolism
9	Transamination and decarboxylation	Transamination and decarboxylation
10	Urea cycle and its disorders	Urea cycle and its disorders
11	Catabolism of phenylalanine and triosine and their disorders	Catabolism of phenylalanine and triosine and their disorders
12	Catabolism of heme and protein metabolism disorders	Catabolism of heme and protein metabolism disorders
13	Purine and pyrimidine biosynthesis and organisation of mammalian genome	Purine and pyrimidine biosynthesis and organisation of mammalian genome
14	Structure and replication of RNA and DNA and RNA transcription	Structure and replication of RNA and DNA and RNA transcription
15	Enzymes and Coenzymes	Enzymes and Coenzymes

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Tutorial no. 02

Q.2 Explain E1 & E2 reaction factor affecting

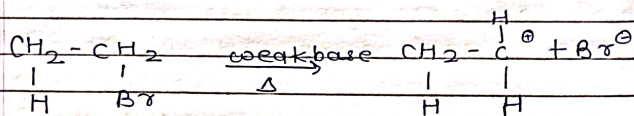
- of E1 & E2.

→ E1 Reaction-

- E1 reaction stands for unimolecular Elimination reaction.
- It is a two step process.
- This reaction follows first order kinetics.
- Weak base used in E1 reactions.
- The reaction is proceed at high temperature.
- The reaction is Endothermic.

Step-I

Formation of Carbocation (Rate determining step)



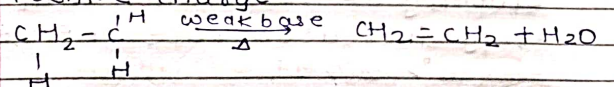
Alkyl halide

Carbocation.

Step II

Loss of proton for the carbon atom adjacent to carbon containing

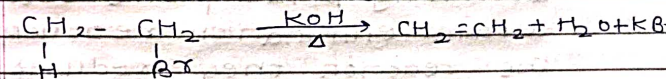
Positive charge



E2 Reaction-

- E2 reaction stands for Bimolecular Elimination Reaction.
- It is a one step process.
- The reaction follow second order kinetics.
- Strong base used in E2 reaction.
- The reaction is proceed at high temperature.
- The reaction is endothermic.

E2 reaction mechanism



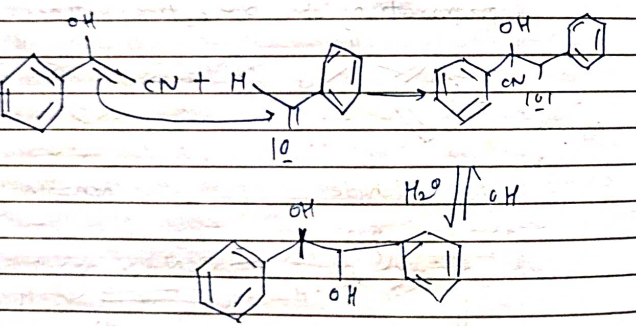
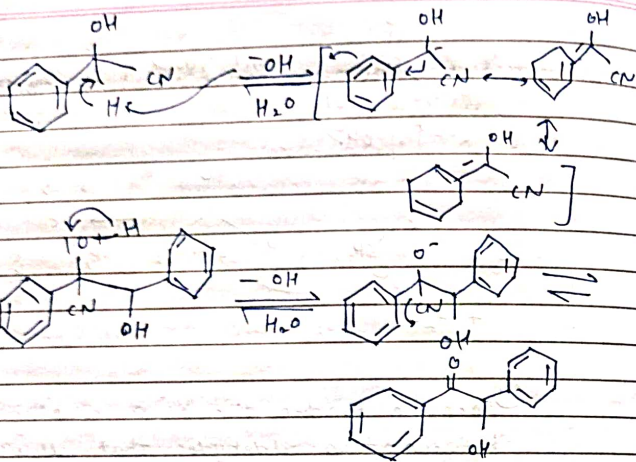
Factors affecting E1 & E2 reaction. carbocation formulation:-

formation of carbocation is a slow & rate determining step in E1 reaction. increasing the number of substituent (R-Group) on C-atom increase the

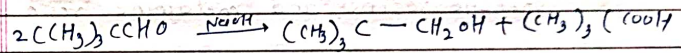
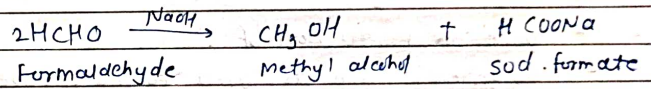
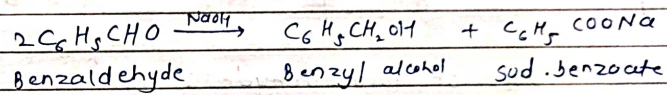


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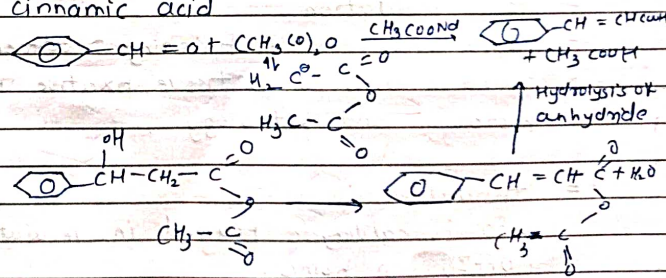
Tutorial : 7



Q7 Short Note on (i) Cannizzaro reaction
(ii) Perkin condensation.
→ Aldehyde are treated with sodium hydroxide to form alcohol & sodium salt of acid.



(i) Benzaldehyde react with acetic anhydride in presence of sodium acetate to form cinnamic acid



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15.	23/7/23	Enzymes and Coenzymes.	52-53

Tutorial - 1.

Biomolecules (carbohydrate, lipid, protein)

Biomolecules :

Biomolecules are the molecules that occurs naturally inside the living organism. Generally most of the biomolecules contains carbon as major element. other than carbon, biomolecules generally contain H, N, O, P, S.

- Types : 1) Biomicromolecules
2) Biomacromolecules.

Characteristics of Biomolecules :

- 1) Most of them are organic compounds.
- 2) They all have specific shapes and dimensions.
- 3) Chemical properties are based on functional group of the molecules.
- 4) The structure and function of cells are determined by biomolecules.
- 5) They are mostly asymmetric
- 6) Large molecules are known as macromolecules that are constructed from small block molecules.



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- 1) Structures of small building block molecules are simple.
- 2) They are involved in exchange of energy.
- 3) e.g. Carbohydrate, proteins, lipids.

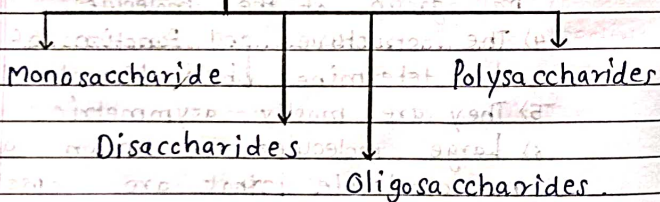
Carbohydrate :

Carbohydrates are biomolecules derived from hydrated carbon.

These are polyhydroxy aldehydes or ketones, made up of basic elements like carbon, hydrogen and oxygen with a hydrogen and oxygen ratio of 2:1.

General formula is : $C(H_2O)_n$

Carbohydrates



Functions :

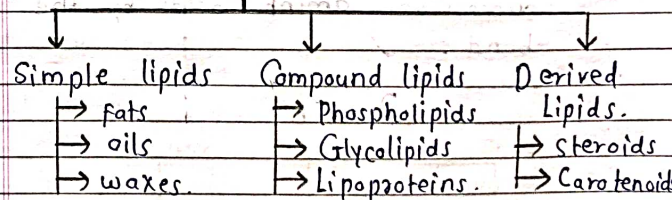
- 1) They serve as major source of energy.
- 2) They control body temperature.
- 3) They are stored as glycogen.
- 4) They maintain glucose level of plasma.

Lipid :

Lipids are organic biomolecules composed of long hydrocarbon chains formed mainly by ester linkage between alcohol & fatty acids. They are building blocks of biological membranes.

Example : Oils, Fats, phospholipids, glycolipids, cholesterol.

Lipids



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Tutorial - 2.

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Bioenergetics

Bioenergetics:

Study of biochemistry where energy relationships and energy transformation take place in living organisms.

Essential Requirements of Bioenergetics:

- 1) The energy is provided for mechanical works.
- 2) The energy is provided for the process of chemical synthesis.
- 3) The energy is provided for anabolic processes in growth.
- 4) The energy breaks the weak bonds and form stronger bonds which allows the release of usable energy.

Bioenergetics is composed of three concepts namely:

- 1) Laws of thermodynamics.
- 2) Thermodynamics concepts
- 3) ATP and phosphagens.

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1) Laws of Thermodynamics:

- 1st Law: It states that energy neither be created nor destroyed. It can only be transferred from one object to another.

$$\Delta U = Q - W$$

- 2nd Law: The entropy of an isolated system is not in equilibrium and will tend to increase spontaneously and reaches maximum value at equilibrium state.

$$\Delta S_{\text{Total}} = \Delta S_{\text{System}} + \Delta S_{\text{Surrounding}} > 0$$

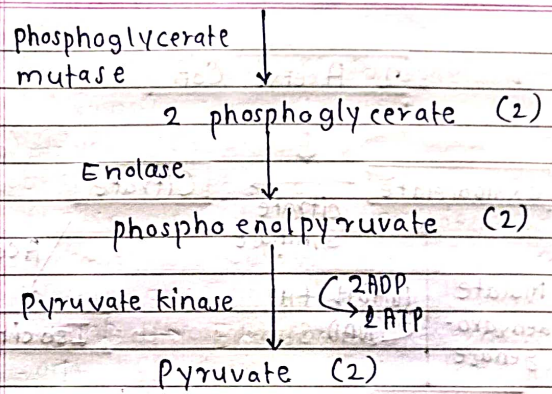
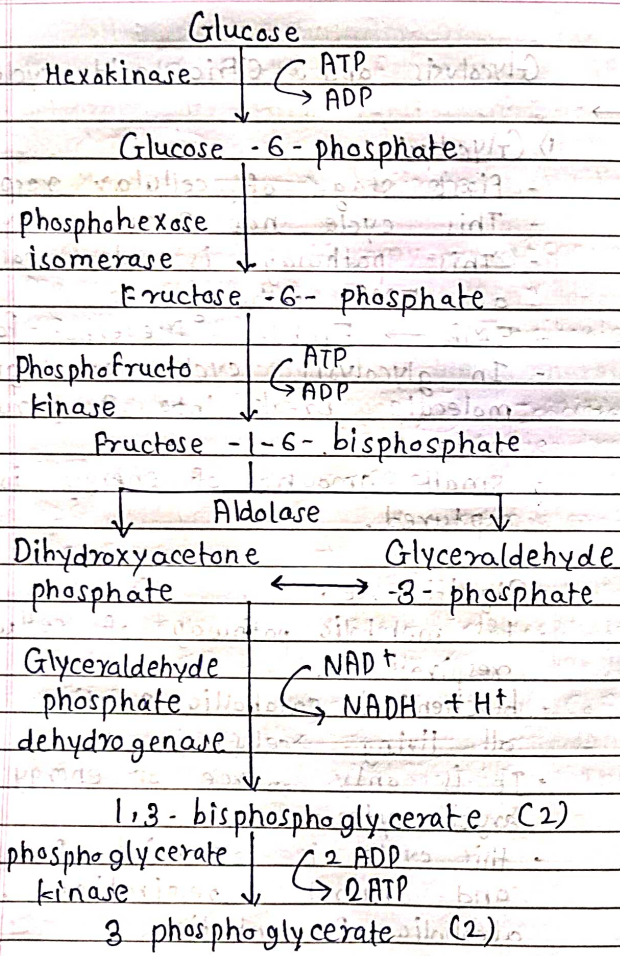
- 3rd Law: The entropy of a perfect crystalline structure approaches a constant minimum as temperature approaches absolute zero.

$$S_{T=0} = 0$$

2) Thermodynamic Concept:

- Enthalpy (H): It is a measure of amount of energy which is released or absorbed in a chemical reaction.

$$\Delta H_{\text{reaction}} = \sum \Delta H_{\text{f, product}} - \sum \Delta H_{\text{f, reactant}}$$



2) Citric acid Cycle :

- It is second step of aerobic respiration
- It is also known as tricarboxylic acid cycle, kreb's cycle.
- It occurs in mitochondria.
- This pathway is amphibolic.
- This cycle is responsible for majority of carbohydrates, fatty acid and amino acid oxidation, generation of many biosynthetic precursors.

Significance :

- Major source of energy for body
- Final common oxidative pathway.



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BP204T Pathophysiology – Theory

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Explain the Pathogenesis of Acute inflammation	Explain the Pathogenesis of Acute inflammation
2	Explain the process of wound healing	Explain the process of wound healing
3	Discuss the Morphology of cell injury	Discuss the Morphology of cell injury
4	Explain in detail about diagnosis and treatment of Asthma	Explain in detail about diagnosis and treatment of Asthma
5	Write a note on renal failure	Write a note on renal failure
6	Explain management of congestive heart failure	Explain management of congestive heart failure
7	Explain treatment, diagnosis and management of Diabetes	Explain treatment, diagnosis and management of Diabetes
8	Describe complications and treatment of acute and chronic peptic ulcer.	Describe complications and treatment of acute and chronic peptic ulcer.
9	Explain in detail about types and pathogenesis of Epilepsy	Explain in detail about types and pathogenesis of Epilepsy
10	Explain the pathophysiology of alcoholic liver disease.	Explain the pathophysiology of alcoholic liver disease.

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11	Write in detail about aetiology and pathogenesis of viral hepatitis	Write in detail about aetiology and pathogenesis of viral hepatitis
12	Describe aetiology and pathogenesis of Gout	Describe aetiology and pathogenesis of Gout
13	Explain typhoid fever	Explain typhoid fever
14	Comment of T.B	Comment of T.B
15	Enlist various Sexually transmitted diseases and add a note of pathology of AIDS.	Enlist various Sexually transmitted diseases and add a note of pathology of AIDS.




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BP101T Human Anatomy and Physiology I– Theory

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Draw a well labelled diagram of cell and describe its anatomy and physiology	Define cell and describe subcellular parts of the cell
2	Discuss in detail about homeostasis along with positive and negative feedback mechanism	What is tissue? Classify it and describe cardiac tissue
3	Explain in detail about tissues in human body	Define blood pressure and explain regulation of blood pressure
4	Give the composition and functions of blood	Describe in detail conduction system of heart
5	Define blood transfusion and explain blood group type in detail	Define anemia and classify it and describe megaloblastic anemia
6	Discuss blood clotting mechanism	Draw a well labelled diagram of skin
7	Give the structure and function of lymph nodes	Describe in detail dermis with accessory organs
8	Explain in detail lymphatic organs of human body	What is the lymphatic system? Explain structure of lymph node
9	Difference between sympathetic and parasympathetic system	Explain function of sympathetic nervous system
10	Write a detail note on cranial nerves and list out spinal nerves of human body	Note on physiology of vision and hearing
11	Discuss anatomy and physiology of nose	Explain effect of parasympathetic nervous system on body
12	Discuss anatomy and physiology of eye	Define joints, classify joints and gives of types of joints movement
13	Explain in short cardiac cycle	What is the skeletal system? Classify appendicular and explain vertebrae.
14	Define skeleton and classify the bones of skeleton	Discuss axial bone and explain facial bones
15	Give the functions of skin	Describe physiology of muscle contraction

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BP102T Pharmaceutical Analysis I – Theory

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Pharmaceutical analysis scope and application	Pharmaceutical analysis scope and application
2	Methods of expressing concentration	Methods of expressing concentration
3	Primary and secondary standards	Primary and secondary standards
4	Errors, accuracy and precision	Errors, accuracy and precision
5	Pharmacopoeia , impurities and limit test	Pharmacopoeia , impurities and limit test
6	Theories of acid-base titration	Theories of acid-base titration
7	Indicators and theories of indicators with neutralisation curve	Indicators and theories of indicators with neutralisation curve
8	Non-aqueous titration	Non-aqueous titration
9	Precipitation titration	Precipitation titration
10	Complexometric titration	Complexometric titration
11	Gravimetric titration	Gravimetric titration
12	Diazotization titration	Diazotization titration
13	Types of redox titration with principle and application	Types of redox titration with principle and application
14	Conductivity of cell and conductometry with application note on reference and indicator electrode of potentiometer.	Conductivity of cell and conductometry with application note on reference and indicator electrode of potentiometer.
15	Ilkonic equation with construction and working of dropping mercury electrode and rotating platinum electrode	Ilkonic equation with construction and working of dropping mercury electrode and rotating platinum electrode

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BP103T Pharmaceutics I – Theory

Tutorial number	A & B Division
1	Flow chart of solid dosage forms classification.
2	Flow chart of liquid dosage forms classification.
3	Give a model prescription.
4	Give the formulae in posology.
5	Write in short about geometric dilutions.
6	Disadvantages of powders
7	Advantages of powders.
8	Differentiate between lotions and liniments.
9	Disadvantages of suspensions.
10	Advantages of suspensions.
11	Disadvantages of suppositories
12	Advantages of suppositories.
13	Write in short about ORS powder.
14	What do you mean by displacement value?
15	Give the formula for the preparation of Paracetamol pediatric elixir.



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BP104T Pharmaceutical Inorganic Chemistry – Theory

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Explain in detail limit test of Arsenic.	Explain in detail limit test of Arsenic.
2	Define Impurity, give its sources, give principle and reaction for limit test for chloride	Define Impurity, give its sources, give principle and reaction for limit test for chloride
3	Define buffer solution, classify them and give ideal requirements of buffers.	Define buffer solution, classify them and give ideal requirements of buffers.
4	Give role of major extra and intracellular electrolyte with examples, give composition of ORS.	Give role of major extra and intracellular electrolyte with examples, give composition of ORS.
5	Define antacids. Give ideal requirements of antacids.	Define antacids. Give ideal requirements of antacids.
6	Classify in detail GIT agent.	Classify in detail GIT agent.
7	State and Explain methods for adjustment of tonicity.	State and Explain methods for adjustment of tonicity.
8	Classify antimicrobials based on their mode of action.	Classify antimicrobials based on their mode of action.
9	Discuss the principle, reaction and assay procedure for calcium gluconate.	Discuss the principle, reaction and assay procedure for calcium gluconate.

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10	Define anti - carries agents. Explain how fluoride produces anti-carries activity.	Define anti - carries agents. Explain how fluoride produces anti-carries activity.
11	Define expectorants. Discuss the physical and chemical properties and assay of ammonium chloride.	Define expectorants. Discuss the physical and chemical properties and assay of ammonium chloride.
12	Define Haematinics. Discuss the physical and chemical properties and assay of ferrous sulphate.	Define Haematinics. Discuss the physical and chemical properties and assay of ferrous sulphate.
13	Define antidote. Discuss the physical and chemical properties and assay of sodium thiosulphate.	Define antidote. Discuss the physical and chemical properties and assay of sodium thiosulphate.
14	What are radio pharmaceuticals? Explain storage conditions.	What are radio pharmaceuticals? Explain storage conditions.
15	Discuss in detail about measurement of radioactivity.	Discuss in detail about measurement of radioactivity.



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BP201T Human Anatomy and Physiology II – Theory

Tutorial number	A & B Division
1	Explain the organs of alimentary tract
2	Explain structure and function of stomach
3	Describe phases of gastric acid secretion
4	Write a note on liver and gallbladder
5	Give structure and function of pituitary gland and pancreas
6	Give structure and function of pituitary gland and thyroid gland
7	Write note on thymus and pineal gland
8	Explain disorders of pancreas and thyroid gland
9	Explain the classification of hormones
10	Explain regulation of acid production through parasympathetic nervous system
11	Enlist the organs of respiratory system and explain in detail mechanism of respiration
12	What are functions of kidney and explain the mechanism of respiration
13	Describe the menstrual phases in details
14	Explain male reproductive system and explain spermatogenesis and penis
15	Classify nervous system and explain structure and functions of brain




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BP202T Pharmaceutical Organic Chemistry I – Theory

Tutorial number	A & B Division
1	What is organic compound & classify them
2	Write down the IUPAC rule for organic compound
3	Write a note on SP ³ hybridization
4	Classify stereochemistry
5	Write down the preparation method of Alkane, alkene and conjugated dienes
6	Write a note on stability of alkenes
7	Explain kinetic order of E ₁ and E ₂ reaction
8	Write a note on allylic reaction
9	Write note on Markownikoff rule
10	Write a note on types of organic reaction
11	Note on nucleophilic addition reaction
12	Write a note on aldol condensation reaction
13	Write a note on cross aldol condensation
14	Write a note on cannizzaro reaction
15	Write a note on perkin condensation



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Index

Sr. No.	Date	Title	Page No.
11.		Give factors affecting on S_N1 and S_N2 Reaction	28-31
12.		Difference betn. E_1 and E_2 reaction	32
13.		Difference betn. S_N1 and S_N2 Reaction	33-34
14.		Give structure and uses of Amphetamine	35
15.		Give brief introduction to Aliphatic amines.	36-37

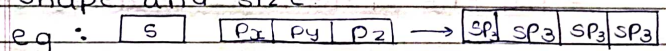
Tutorial no. 01

MISRA
PAGE NO: 1
DATE: / /

Q-1 Explain hybridization Give brief idea about sp^3 , sp^2 & sp hybridization

→ Hybridization :-

It is defined as intermixing of atomic orbitals of same or nearly same energy to give new hybrid orbitals of exactly same energy shape and size.



Characteristics of Hybridization

- All the hybrid orbitals have exactly same properties (e size energy shape etc)

- The no. of hybrid orbitals = no. of intermixing orbitals.

- The names of hybrid orbitals is done on the name of intermixing orbitals.

i.e $1s + 2s = sp^2$

$1s + 3p = sp^3$

$1s + 3p + d = sp^3d$ & so on...

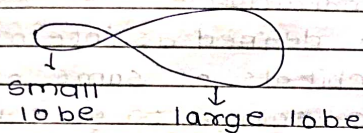
• Shape of Hybrid orbitals.

- Hybrid orbitals contain one small



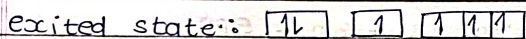

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lobe & Generally small lobe is not represented.

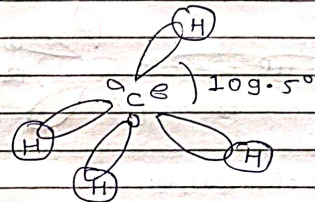


• **sp³ Hybridization**

- All the carbons of alkanes shows sp³ hybridization
- In sp³ hybridization one s orbital combines with three p orbitals to form four equivalence sp³ hybrid orbitals.
- Each sp³ hybrid orbital shows 25% s orbital characteristics & 75% p orbital characteristics.
- eg. - sp³ hybridization of carbon in alkanes.

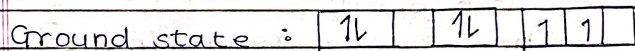


- The carbon of alkanes show tetrahedral arrangement
- The angle between two orbitals is 109.5°.



• **sp² Hybridization**

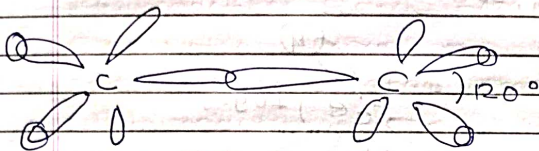
- when 1 s orbital combines with two p orbitals to form new hybrid orbitals of same size, shape and energy then this type of hybridization is known as sp² hybridization
- The carbons of simplest alkene i.e ethene shows sp² hybridization in the case of Ethene



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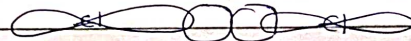
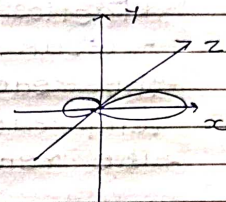
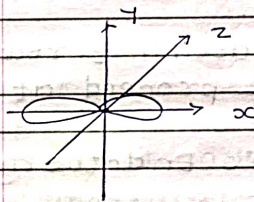
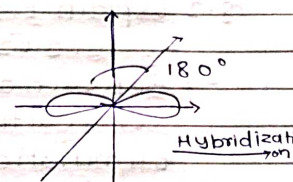
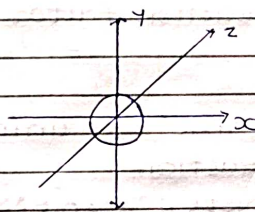
Hybridized state: $\uparrow\downarrow$ $\uparrow\uparrow\uparrow$ \uparrow
Hybridization orbital (sp^2)

Structure of ethene



• sp Hybridization

- The combination of one s and one p orbital results in the formation of two sp hybrid orbitals.
- Two sp hybrid orbitals are linearly arranged (bond angle 180°) to have minimum electronic repulsion.
- The $sp-sp$ overlap from each carbon result in carbon-carbon σ bond formation whereas $sp-s$ overlap results in the formation of two C-H σ bonds.
- Their overlap results in the formation of two π bond.



Tutorial no. 02

Q.2 Explain E1 & E2 reaction factor affecting

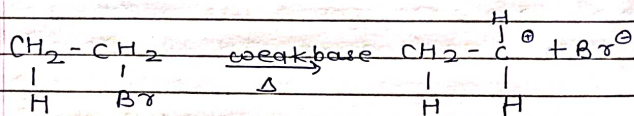
- of E1 & E2.

→ E1 Reaction-

- E1 reaction stands for unimolecular Elimination reaction.
- It is a two step process.
- This reaction follows first order kinetics.
- Weak base used in E1 reactions.
- The reaction is proceed at high temperature.
- The reaction is Endothermic.

Step-I

Formation of Carbocation (Rate determining step)



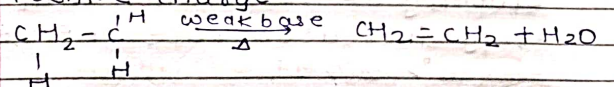
Alkyl halide

Carbocation.

Step II

Loss of proton for the carbon atom adjacent to carbon containing

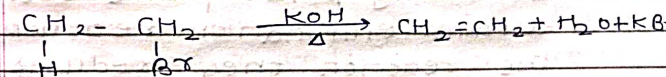
Positive charge



E2 Reaction-

- E2 reaction stands for Bimolecular Elimination Reaction.
- It is a one step process.
- The reaction follow second order kinetics.
- Strong base used in E2 reaction.
- The reaction is proceed at high temperature.
- The reaction is endothermic.

E2 reaction mechanism



Factors affecting E1 & E2 reaction. carbocation formulation:-

formation of carbocation is a slow & rate determining step in E1 reaction. increasing the number of substituent (R-Group) on C-atom increase the



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List of Tutorials (S. Y. B. Pharmacy)

Academic Year 2022-23

BP301T. PHARMACEUTICAL ORGANIC CHEMISTRY –II (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
1	Draw the structure of benzene, phenol, aniline, benzoic acid, naphthalene, anthracene, phenanthrene, cyclohexane, cyclopropane, cyclobutane, triglyceride
2	Enlist the electron withdrawing group or substituent and electron releasing and donating substituent explain with example
3	Write down synthetic uses of aryldiazonium salt
4	Draw the structure and uses of phenol, cresol and naphthol
5	Enlist aromaticity criteria. explain aromaticity of benzene
6	Enlist the reaction of benzene explain nitration reaction of benzene
7	Define fats and oils, give the difference between fats and oils
8	Write a note on: saponification, rancidity, hydrogenation.
9	Describe analytical constants in detail: acid value, iodine value, RM value.
10	What is polynuclear hydrocarbon? Draw the structure and uses of naphthalene, phenanthrene and anthracene.
11	Write down the reaction of anthracene and naphthalene
12	Write a note on Haworth synthesis of naphthalene and phenanthrene
13	Describe Baeyer's strain theory and Saches-Mohr's theory



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14	Write a note on collusion and Moffit's modification
15	Elaborate in detail about the Diphenylmethane and Triphenylmethane

BP302T. PHYSICAL PHARMACEUTICS-I (Theory)

Tutorial number	Tutorial Questions	
	A Division	B Division
1	<ol style="list-style-type: none">1. Define saturated and unsaturated solution2. Write about mechanism of solute solvent interaction	Set of multiple choice questions on Unit 1
2	Describe the factors which affect solubility of drugs	Set of multiple choice questions on Unit 1
3	Write the properties of solid and liquid	Set of multiple choice questions on Unit 1
4	Define sublimation, latent heat, freezing point, and melting point	Set of multiple choice questions on Unit 2
5	<ol style="list-style-type: none">1. What is refractive index2. Define optical rotation and dielectric constant3. Write applications of refractive index and optical rotation	Set of multiple choice questions on Unit 2
6	Define surface and interfacial tension	Set of multiple choice questions on Unit 2



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7	Prepare 5 mcqs with answers on chapter surface and interfacial phenomenon	Set of multiple choice questions on Unit 3
8	1. Draw a diagram of capillary rise method 2. Draw a diagram of Wilhelmy plate method	Set of multiple choice questions on Unit 3
9	1. Draw a diagram of dunoys ring method 2. Draw a diagram of pendant drop shape method	Set of multiple choice questions on Unit 3
10	1. What is spreading coefficient 2. Define surfactant and classify it	Set of multiple choice questions on Unit 4
11	1. What is surface active agent 2. Draw a diagram of HLB scale	Set of multiple choice questions on Unit 4
12	1. Define complexation 2. Classify the complex	Set of multiple choice questions on Unit 4
13	Prepare 5 mcqs with answers on unit 4	Set of multiple choice questions on Unit 5
14	1. Define metal complex 2. What is inclusion complex	Set of multiple choice questions on Unit 5



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15	Prepare 5 mcqs with answers on Unit 5.	Set of multiple choice questions on Unit 5
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BP 303 T. PHARMACEUTICAL MICROBIOLOGY (Theory)

Tutorial number	Tutorial Questions	
	A Division and B Division	
Prepare 10 multiple choice questions (MCQs) with four options (Underline correct option)		
1	Introduction, history of microbiology, its branches, scope and its importance, Introduction to Prokaryotes and Eukaryotes	
2	Study of ultra-structure and morphological classification of bacteria, Nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve	
3	Isolation and preservation methods for pure cultures, cultivation of anaerobes, quantitative measurement of bacterial growth (total & viable count)	
4	Study of different types of phase contrast microscopy, dark field microscopy and electron microscopy	
5	Identification of bacteria using staining techniques (Simple, Gram's & Acid fast staining) and biochemical tests (IMViC)	
6	Study of principle, procedure, merits, demerits and applications of Physical, chemical and mechanical method of sterilization. Evaluation of the efficiency of sterilization methods, Sterility indicators	
7	Study of morphology, classification, reproduction/replication and cultivation of	



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	Fungi. Classification and mode of action of disinfectants
8	Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions. Evaluation of bactericidal & bacteriostatic
9	Designing of aseptic area, laminar flow equipments; study of different sources of contamination in an aseptic area and methods of prevention, clean area classification
10	Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids
11	Assessment of a new antibiotic and testing of antimicrobial activity of a new substance. General aspects-environmental cleanliness
12	Study of morphology, classification, reproduction/replication and cultivation of Virus
13	Types of spoilage, factors affecting the microbial spoilage of pharmaceutical products, sources and types of microbial contaminants, assessment of microbial contamination and spoilage
14	Preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations
15	Growth of animal cells in culture, general procedure for cell culture, Primary, established and transformed cell cultures. Application of cell cultures in pharmaceutical industry and research



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BP 304 T. PHARMACEUTICAL ENGINEERING (Theory)

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Write a principle & draw a labelled diagram of FBD	Define drying & enlist detail classification of dryers. Draw well diagram of spray dryer
2	Write a principle & draw a labelled diagram of lyophilizer	Write short note on mechanism of drying in schematic representations
3	Write a principle & draw a labelled diagram of plate & frame filter	Define mixing & elaborate factors affecting on mixing
4	Write a principle & draw a labelled diagram of rotary drum filter	Explain in detail planetary mixer
5	Write a principle & draw a labelled diagram of perforated basket centrifuge	Enlist classification of mixing & give its application
6	Write a principle & draw a labelled diagram of fluid energy mill	Write short note on azeotropic or molecular distillation
7	Write a principle & draw a labelled diagram of cyclone separator	Define distillation & give reasons on application of distillation
8	Write a principle & draw a labelled diagram of ball mill	Define evaporation & explain in short horizontal tube evaporator



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9	Write a principle & draw a labelled diagram of orifice metre	Define EMC, CMC, TMC, FMC, drying rate & moisture content with formula
10	Write a principle & draw a labelled diagram of multiple effect evaporator	Write a short note on mechanism of filtration
11	Write a principle & draw a labelled diagram of fractional distillation	Write a short note on membrane filter
12	Write a principle & draw a labelled diagram of steam distillation	Give formula for ROE, ROF, LOD & Area
13	Write a principle & draw a labelled diagram of twin shell blender	Draw a neat well label diagram of chamber press filter
14	Write a principle & draw a labelled diagram of planetary mixers	What is the role of pharmaceutical engineering in designing of pharmaceutical industry
15	Write a principle & draw a labelled diagram of Silverson Emulsifier	What is the role of calcium carbonate, starch, lactose, magnesium stearate & cellulose etc mostly in our engineering practicals.



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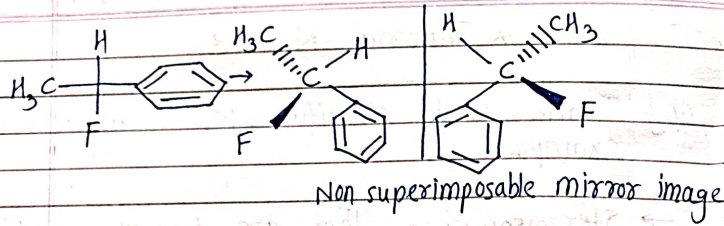


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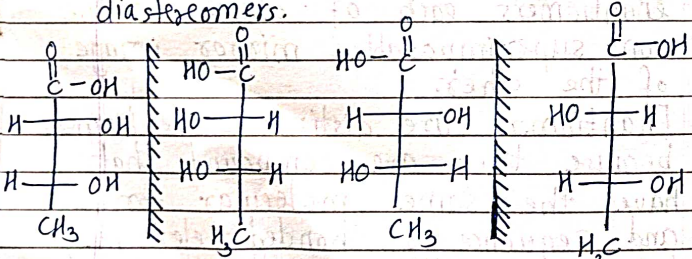
BP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III (Theory)

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Define & classify stereoisomer with example	Define geometric isomers and explain the method of nomenclature of geometric isomers
2	What do you mean by racemic mixture & racemic modification? Explain various methods of resolution of a racemic mixture.	Discuss the methods used to determine the configuration of geometrical isomers.
3	Give the various method for determination of geometrical isomers	What is racemic modification? Discuss the method of resolution of racemic modification.
4	Explain in detail the RS system of nomenclature of optical isomers.	Define configuration. Explain the sequence rule for R S and D L configuration?
5	What are stereoselectivity and stereospecificity? Explain it with a suitable example.	What are symmetric and asymmetric molecules? Explain asymmetric synthesis.
6	Explain the reaction & mechanism involved in Backmanns rearrangements	What are heterocyclic compounds? give their systematic nomenclature and classification
7	Explain the reaction & mechanism involved in the Schmidt reaction.	give the methods of synthesis and chemical reaction of furan and thiopene
8	Explain synthesis, reactions & medicinal uses of furan	explain the stereochemistry of biphenyls and conditions required for optical



Diastereomers:-

That occurs when 2 or more stereoisomers of a compound have different configurations at one or more of the equivalent stereocenters. Stereoisomerism in compounds with 2 or more dissimilar chiral centers are diastereomers.



① Mirror enantiomers

② Mirror enantiomers

struc. ① & ③ }
struc. ① & ④ } These all are ~~two~~ diastereomers
struc. ② & ③ }
struc. ② & ④ }

* Tutorial No. 02

Q] What do you mean by racemic mixture and racemic modification? Explain various methods of resolution of a racemic mixture.

→ A mixture of equal parts of enantiomers is called a racemic modification. A racemic modification is optically inactive when enantiomers are mixed together, the rotation caused by a molecule of one isomer is exactly cancelled by an equal and opposite rotation caused by a molecule of its enantiomer.

Resolution of Racemic Mixtures:-

The process of separation of a racemic mixture into two pure enantiomers is called resolution:-

- ① Mechanical Separation
- ② Resolution using diastereomers
- ③ Bio-chemical process
- ④ Differential absorption
- ⑤ Chiral recognition



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① Mechanical separation:-

Louis Pasteur first used this method in 1848 to separate the stereo isomers of crystalline tartaric acid sol. dextro(+) & levo(-) compounds. e.g. Sodium Ammonium tartarate crystallizes separately, (+) dextro crystallizes out.

② Conversion of Diastereomers:-

The racemic mixture is reacted with an optically active reagent to yield a product which is a mixture of two diastereomers. According to a certain physical property diastereomers are separated from one another.

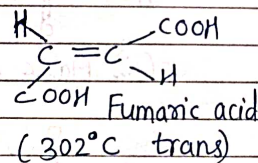
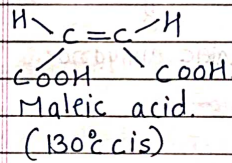
③ Enzymatic resolution:-

If a racemic mixture can be fed to a living organism, then it is often found that of enantiomer is preferentially metabolized. If this is so, then the unwanted isomer can sometimes be recovered.

* Tutorial No. 03

Q.] Give the various methods for determination of geometrical isomers.

→ ① Melting points:- The trans-isomer has a higher melting point than corresponding cis isomer.



② Solubility:-

Cis isomer is less closely packed and have weak intermolecular forces of attraction in crystal lattice than trans isomer.

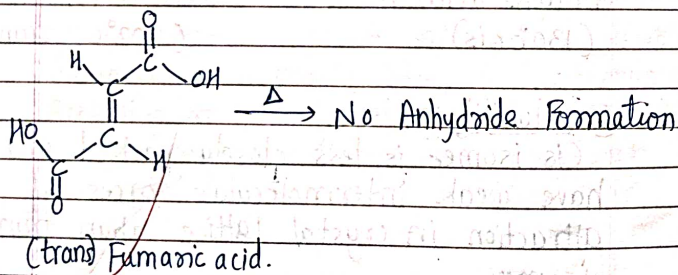
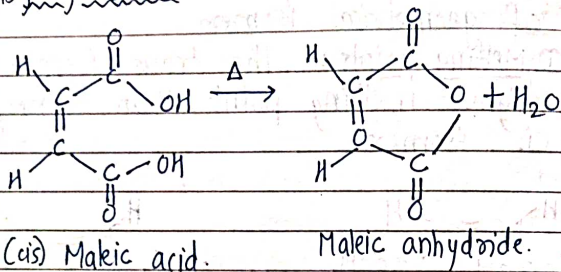
Cis isomers are having higher solubility than trans isomers. Cis-maleic acid (79 g/100 ml of H₂O); Trans-Fumaric acid (0.7 g/100 ml of H₂O).



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• Chemical method:-

i) By cyclization.



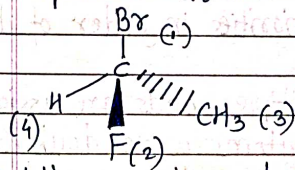
* Tutorial No. 04

Q7 Explain in detail the R/S system of nomenclature of optical isomers.

→ It is strategy for determining whether the chiral center has an R/S configuration based on the symmetry properties of tetrahedral carbon.

• Rules

① Priority is first assigned on the basis of the atomic number of the atoms attached directly to the chiral centers. Atoms of higher atomic no. are given higher priorities. Thus for 1-bromo-1-fluoro-ethane, the order of priorities is $Br > F > C > H$ on the basis of their repetitive atomic numbers $35 > 9 > 6 > 1$.



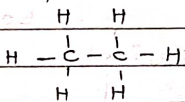
② When assignment of priority can't be made on the basis of atoms attached directly to the chiral center, proceed away from the chiral center and examine the next

relative arrangement of atoms or groups in space are called stereoisomers and the phenomenon is called stereoisomerism.

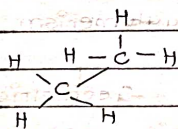
• Conformational isomers

stereoisomers which differ in the relative positions of some of the atoms in the molecule in three dimensional space due to rotation about sigma bonds are called conformational isomers.

Example:-



Ethane



Sawhorse formula

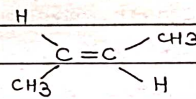
• Configurational isomers

stereoisomers which arise due to some sort of rigidity within the molecule and which can be remaking of the covalent bonds

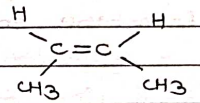
and not by rotation about sigma bonds are called configurational isomers.

• Geometrical isomerism

Such isomers which have the same structural formulae but differ in the relative spatial arrangement of atoms or groups around the double bonds are called geometrical isomers

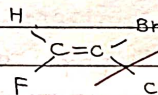


Trans isomer



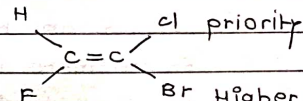
cis isomer

eg:-



E-isomer

Entgegen



Z-isomer

Zusammen.



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Tutorial-02

- What do you mean by racemic mixture and racemic modification? Explain various methods of resolution of racemic mixture.

Racemic mixture

- A mixture having equal amounts of enantiomers is called as racemic mixture
- A racemic mixture is denoted by (\pm)
- Racemic mixture is optically inactive
- mixture may have different b.p and m.p from the enantiomers.

Resolution of Racemic mixture

- The process of separation of a racemic mixture into two pure enantiomers is known as resolution
- Enantiomers have identical physical properties and hence it is difficult to separate enantiomers using conventional methods.

1) Mechanical Separations

Louis Pasteur first used this method in 1848 to separate the stereoisomer crystalline tartaric acid sol. for example:- ammonium

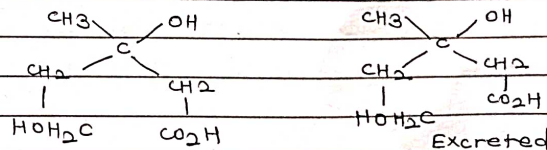
tartarate crystallizes separately (+) dextro crystallizes out, where (-) levo not. The sublimation method is very easy for the separation.

2) conversion to Diastereomers

The racemic mixture is reacted with an optically active reagent to yield a product is a mixture of two diastereomers. According to a certain physical property diastereomers are separated from one another. Separated diastereomers are reacted reconvert them to optically active reagent and separated enantiomers.

3) Enzymatic (Biological) resolution

- If racemic mixture can be fed to animals and found that enantiomer is metabolized.
- When racemic mixture of mevalonic acid is fed to rats, one optical isomer is totally absorbed, and almost all other is excreted in the urine and is recovered



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		activity.
9	Explain synthesis, reactions & medicinal uses of thiophene	explain aromaticity and reactivity of furan, pyrrole and thiophene
10	Explain the synthetic method & two characteristic reactions for Imidazole & pyrrole	write in detail Wolff-Kishner reduction reaction
11	Give any two methods of preparation & chemical reaction of pyridine	explain the mechanism involve schmidt reaction
12	Explain the chemical reactions of Quinoline and Isoquinoline	write the Dakin reaction and its synthetic applications
13	Write a note on reactions and synthesis of Indole.	write a note on Claisen-Schmidt Condensation reaction
14	Write synthesis and medicinal uses of Pyrimidine.	write a note on Metal hydride reduction
15	Comment on electrophilic substitution in five-membered heterocycles.	give in detail Oppenauer-oxidation

BP402T. MEDICINAL CHEMISTRY – I (Theory)

Tutorial number	Tutorial Questions	
	A Division and B Division	
1	1. Write in brief about Physicochemical Prop. 2. Explain Bioisosterism	
2	1. Explain Sources of lead discovery 2. Explain geometrical isomerism	



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3	<ol style="list-style-type: none">1. Explain factor affecting metabolism2. Write about Phase 1 metabolism
4	Prepare 5 MCQ's on unit 1
5	<ol style="list-style-type: none">1. Write about Sympatomimetic system2. Biosynthesis of Adrenaline
6	<ol style="list-style-type: none">1. Write synthesis of Epinephrine & Phenylephrine2. Write SAR of Adrenaline
7	<ol style="list-style-type: none">1. Explain the receptor & Physiological function of Ach2. Explain the chemistry of Ach3. Explain the SAR & MOA of cholinergic receptors
8	<ol style="list-style-type: none">1. Write SAR of cholinergic antagonist drugs2. Synthesis of Ipratropium bromide & dicycloamine
9	Write about SAR of Barbiturates
10	<ol style="list-style-type: none">1. SAR of Benzodiazepines2. Write a note on cholinergic reactivators
11	Write the Classification of NSAID
12	Write the classification of narcotic analgesic
13	Write the classification of G.A
14	Write the stages of G.A
15	Prepare 5 MCQ`s on Unit 5



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BP 403 T. PHYSICAL PHARMACEUTICS-II (Theory)

Tutorial number	Tutorial Questions	
	A Division	B Division
1	<ol style="list-style-type: none"> Define dispersion system and classify it Write a difference between molecular, colloidal and coarse dispersion 	Discuss general characteristics, shape & size of colloidal particles
2	<ol style="list-style-type: none"> Enlist the method used for preparation of lyophobic colloids What is tyndall effect 	Write in detail classification of colloids
3	Write and difference between lyophilic and lyophobic colloids	Note on Optical, Kinetic and Electrical properties of colloids
4	Describe in short about electrical double layer in colloids	Define rheology, explain newtons law of flow with rheogram
5	Define rheology and write in short about dilatant flow	Write a note on Non-Newtonian type of flow with detail discussion
6	Write a note on plastic and pseudoplastic flow	Discuss plastic & elastic deformation, mention heckles equation
7	<ol style="list-style-type: none"> Describe in short about thixotropy Define plastic deformation and 	Write a note on stability aspects of suspensions



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	elastic deformation	
8	<ol style="list-style-type: none"> 1. Define suspension and write its types 2. Prepare 5 mcqs with answers on UNIT-III 	Differentiate between flocculated & deflocculated suspensions
9	Prepare 5 mcqs with answers on UNIT-I	Discuss in detail various theories of emulsification
10	Prepare 5 mcqs with answers on UNIT-II	Define micromeritics, write pharmaceutical applications of it
11	<ol style="list-style-type: none"> 1. Define emulsion and Enlist the type of emulsion 2. Enlist the identification method of emulsion 	Write a note on different methods to determine particle size
12	<ol style="list-style-type: none"> 1. Write a difference between suspension and emulsion 2. Define microemulsion 	Explain in detail various derived properties of powders
13	<ol style="list-style-type: none"> 1. Define micromeritics and enlist the method of determination of particle size 2. Enlist the method of used for determination of surface area 	Explain different order reactions with suitable examples
14	<ol style="list-style-type: none"> 1. Define bulk, true, tapped density and angle of repose 	Explain different physical and chemical factors influencing chemical degradation



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	2. Prepare 5 mcqs with answers on UNIT-IV	of pharmaceutical products
15	1. Define order of reaction and write a shelf life and half-life equation of zero order reaction 2. Prepare 5 mcqs with answers on UNIT-V	Write a note on accelerated stability studies in detail

BP 404 T. PHARMACOLOGY-I (Theory)

Tutorial number	Tutorial Questions	
	A Division and B Division	
1	1. Define pharmacology and describe history and scope of pharmacology. 2. Write about nature and sources of drug information. 3. Explain routes of administration.	
2	1. Define agonist, antagonist, inverse agonist, partial agonist with suitable example. 2. Define pharmacokinetics and write about membrane transport. 3. Write about absorption and distribution in detail.	
3	1. Write about metabolism and excretion of drugs. 2. Write a note on enzyme induction and enzyme inhibition. 3. Define pharmacodynamics & give detail about basic principles of drug action.	
4	1. Write about receptor theory. 2. Explain in detail G-protein coupled receptor and ion channel. 3. Give detail about transmembrane enzyme linked receptor and JAK-STAT binding receptor.	

Tutorial-1

1] Define pharmacology and describe history and scope of pharmacology.

→ Pharmacology: It is the science of drugs derived from two greek words: "Pharmakon" means drugs and "logos" means to study. - It is the study of actions of drugs on living system.

• History and scope of pharmacology

1] History:

• 1] Hippocrates: A greek physician considered "Father of Medicine".

- He was first person who recognize disease as abnormal reaction of body.

2] Theophrastus (380-287 BC):

- A great philosopher called "father of pharmacognosy".

3] Paracelsus: A swiss scholar & alchemist, after considered as "grand father of pharmacology".

4] Francois Megendia: A first pharmacologist established the foundation of modern pharmacology.



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* Scope of Pharmacology:

- 1] It provides the rational basis for the therapeutic use of the drug. Before the establishment of this discipline even though many remedies were used, but doctors were reluctant to apply scientific principle to therapeutics.
- 2] In 1920s many synthetic chemicals were first introduced & the modern pharmaceutical companies began to develop.
- 3] Scientific understanding of drugs enables us to predict the pharmacological effect of a new chemical that will produce a specified therapeutic effect.
- 4] Our society needs pharmacologist who understand the basic of modern therapeutics for careers within academic, pharmaceutical & governmental laboratories to study & develop develop tomorrow's drugs.



2] Write about the nature and sources of Drugs.

→ 1] Nature of drugs:

All drugs are chemical entities with simple or complex molecules.

- Inorganic drugs - Some drugs are of inorganic nature

eg ferrous sulphate, lithium carbonate.

- Organic drugs - Majority of drugs are organic in nature.

weakly acidic - aspirin, penicillin.

weakly basic - Morphine

Non-electrolytes - alcohol.

2] Sources of Drugs:

The six main sources of drugs include

1] Plant sources.

2] Animal sources.

3] Mineral / Earth sources.

4] Microbiological sources.

5] Semi-synthetic sources.

6] Recombinant DNA technology.

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Sr. No.	Date	Title	Remark	Pg. No.
8	3-5-23	- write a note on β -blocker & anti-histamine interactions of β -blocker. - define parkinsonism describe its pathophysiology. - Describe parkinsonism of axiety. - Explain pharmacology of Levodopa.		
9	10-3-23	- write about Dopa decarboxylase - write note on monoamine oxidase - write about central anticholinergics		
10	17-3-23	- define alcoholism of alcohol. - Pharmacokinetic of alcohol. - write about disulfiram.		
11	24-3-23	- Define general & local anaesthetics balanced cardiac GP. - write of MAC.		
12	3-3-23	- write a note on drug addiction. - Given in detail about CNS Stimulant.		
13	7-4-23	- Explain p'ology of valproic acid. - Define sedative & hypnotics - write about pharmacology		
14	9-4-23	- Detail local anaesthetic - Explain pharmacology. - Explain p'ology of Atropin		
15	15-4-23	- Explain p'ology & adrenergic drug. - Explain p'ology & Phenoxybenzamine.		

Tutorial No : 01



1) Define pharmacology and describe history and scope of pharmacology?

→ Pharmacology : It is the science of drug derived from two Greek words 'Pharmakon' means drugs and 'logos' means to study.

- It is the study of actions of drugs on living system.

• History and scope of pharmacology :

1) Hippocrates : A greek physician consider "father of medicine"

- He was first person who recognize disease as abnormal reaction of body.

2) Theophrastus : (380 - 287 BC) :

- It great philosopher called "father of pharmacognosy".



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3) Paracelsus: A Swiss scholar and alchemist, after consider as "Grand father of pharmacology".

• Francois megenia: A first pharmacologist established the foundation of modern pharmacology.

• Rudolph Buchheim: German pharmacologist a key figure in the development of pharmacology.

• Frederich serturnet: German pharmacologist assistant, isolated morphine - the first pure drug - in 1805.

• Claude Bernard: considered father of experimental medicine.

• Oswald Schmiedeberg: "father of pharmacology" established pharmacology as an independent discipline.

• Scope Of Pharmacology:

- It provides the rational basis for the therapeutic use of the drug, before the establishment of this discipline even though many remedies were used, but doctors were reluctant to apply scientific principle to therapeutics.

- In 1920s many synthetic chemicals were first introduced and the modern pharmaceutical companies began to develop.

- Our society needs pharmacologist who understand the basic of modern therapeutics for careers within academic pharmaceutical & governmental laboratory to study & develop tomorrow's drugs.

2) Write about the nature and sources of drugs?

→ 1) Nature of drugs:

All drugs are chemical entities with in simple or complex molecules.

• Inorganic drugs: Some drugs are of inorganic nature.

eg: ferrous sulphate, lithium carbonate.

• Organic drugs: majority of drugs are organic in nature.

weakly acidic - Aspirin, penicillium.

weakly basic - morphine

Non-electrolytes - alcohol

2) Sources of Drugs:

- The six main sources of drug include:

1) Plant sources

2) Animal sources

3) Mineral sources

4) Microbiological sources.

5) Semi-synthetic sources.

6) Recombinant DNA technology.

1) Plant Sources: - Plant source is the oldest source of drugs.

- Most of drugs in ancient time were derived from plants.

- Almost all parts of the plants are used.

i.e: leaves, stem, barks, fruits & roots.

2) Animal sources:

- Pancreas is a source of insulin, used in treatment of Diabetes.

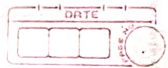
- Sheep thyroid is a source of thyroxin which is used in hypertension.

- Cold liver is used as a source of vitamin D.

- Blood of animals is used in preparation of vaccines.



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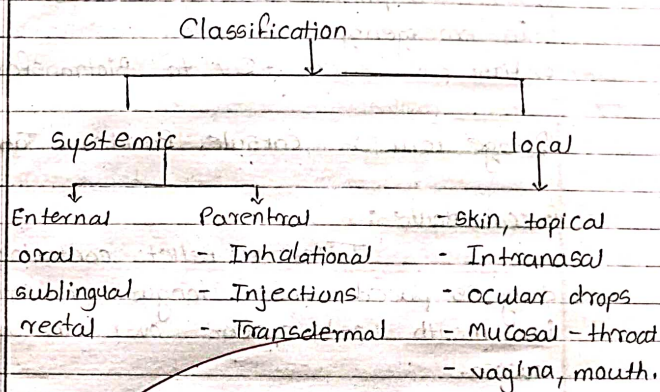


3) Mineral sources:

- Iron is used in treatment of iron deficiency anemia.
- mercurial salt are use in suphilis.
- Iodine is antiseptic Iodine supplements are also used.
- Fluorine has antiseptic properties.
- petroleum is used in prepration of liquid paraffin.
- Borax has antiseptics properties as well.



3) Explain the route of drug administration?



ORAL ROUTE:

- The most common route of drug administration.

Advantages:

- 1) safe, painfree, self-administered.
- 2) convenient, Economical.




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13	<ol style="list-style-type: none"> 1. Explain pharmacology of valproic acid and phenobarbitone. 2. Define sedative hypnotics and write about pharmacology of barbiturates. 3. Explain pharmacology of benzodiazepine as a sedative hypnotics.
14	<ol style="list-style-type: none"> 1. Define anaesthetics and explain pharmacology of lidocaine and bupivacaine 2. Explain pharmacology of cholinergic drugs. 3. Explain pharmacology of atropine.
15	<ol style="list-style-type: none"> 1. Explain pharmacology of adrenergic drug. 2. Explain pharmacology of phenoxybenzamine and prazosin.

BP 405 T.PHARMACOGNOSY AND PHYTOCHEMISTRY I (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
1	Define pharmnutritionalacognosy
2	Discuss the scope and application of Pharmacognosy
3	Write down Pharmacognosy of organized plant for (Even roll number Students) and Unorganized Plant (Odd Roll Number Students)
4	Write in detail Quality Control Paramter with Examples
5	Explain Lycopodium spore Methods
6	Prepare 20 MCQ's on UNIT-I
7	Define Cultivation explain Factor of cultivation
8	Plant hormones and their applications
9	Conservation of medicinal plants

Index

Sr. No.	Date	Title	Page No.
-	-	their applications	-
9)	16/3/23	Write in detail conservation of medicinal plants	27-28
10	20/3/23	prepare 10 mcq on unit -II	29-30
11	23/3/23	Define plant tissue culture and their application	31-32
12	6/4/23	Write in brief edible vaccines	33-34
13	10/4/23	write in detail of secondary metabolite & explain any example	35-36
14	20/4/23	Discuss plant products	37-39
15	27/4/23	prepare 10mcqs of unit III, IV & V.	40-41

PAGE NO.	1
DATE:	1/5/23

Activity - 01

Open Book test

- Q1) Define pharmacognosy
- Q2) History of pharmacognosy
- Q3) Scope and development of pharmacognosy
- Q4) Application of pharmacognosy

Q1) ⇒ Pharmacognosy is the study of drugs having their origin in plants and animal kingdom. The subject pharmacognosy can also be expressed as an applied science that deals with the biological, biochemical, therapeutic and economic features of natural drugs and their constituents.

The word Pharmacognosy is derived from the Greek words "Pharmakon" (drug) and "gnosis" (knowledge). It is known as pharmacognosy.

Q2) ⇒ The history of pharmacognosy is as old as human existence. In that era maximum plant-based medicines were used. Before the beginning of christian era, many ancient documents revealed plants




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were used largely by Asian namely china, India, Egypt and Greece.

- Hippocrates (460-370 BC), a Greek scientist, is known as father of medicine
- He worked on human anatomy and physiology, particularly circulatory system and nervous system

- Aristotle (384-322 B.C) & Theophrastus (370-287 B.C) well known philosopher and scientist known for writing animal and plant kingdom

- Charak compiled a group of ten herbs that related to a certain disease. He made 50 such groups which cover almost all the drugs required by physicians for treatment. Then he wrote the book "Charak Samhita".

- Sushruta arranged a large number of drugs into distinct sets depending on their properties. He was one who

introduced the practice of surgery. He arranged all his meticulous work into his book "Sushruta Samhita".

(Q3) ⇒ • The scope of pharmacognosy has expanded from the traditional morphological description of plants and animals.

- Pharmacognosy is critical in development of different disciplines of science

- The knowledge of plant taxonomy, plant breeding, and plant pathology and plant genetics is helpful in development of cultivation technology for medicinal and aromatic plants.

- Phytochemistry has undergone scientific development in recent years as distinct discipline.

- Extraction, isolation, purification and characterization of phytochemical from natural sources are important for medicinal system.



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development of pharmacognosy

- modern pharmacognosy occurred during 1934-1960
- Discovery of penicillin in 1928 by Alexander Fleming
- Isolation of Reserpine 1952
- Anticancer properties of vinca rosea

Q4) ⇒ Application of pharmacognosy

- 1) plant Bioactive extraction and isolation
- 2) Development of plant biomarkers
- 3) Development of nano fertilizers and nano medicines
- 4) Nutraceuticals towards biochemical mechanisms of healthy aging
- 5) It is used screen, characterize and produces new drugs for treatment of human diseases
- 6) It is used for Fingerprinting and quality control

Tutorial - 01

- prepare 10 MCQ on Introduction to pharmacognosy. (unit - I)

- 1) The term pharmacognosy was first used by
- a) Anotheus Seydler
 - b) Schmidt
 - c) Theophrastus
 - d) Both a and b

- 2) The animal and plant kingdom was written by
- a) Dioscorides
 - b) Theophrastus
 - c) Seydler
 - d) Galen

- 3) cinchona officinalis is a source of
- a) Quinine
 - b) Quassin
 - c) Emetine
 - d) Both a and b

- 4) Which of the following is example of unorganized drug
- a) Digitalis
 - b) Nux vomica
 - c) Acacia
 - d) Ephedra

- 5) Digitoxin (Digitalis purpures) used for
- a) Pain relief
 - b) Anticancer



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- c) Antioxidant d) cardiac disease
- 6) The system based on serology study
a) chemo-taxonomical b) serotaxonomical
c) pharmacological d) Alphabetical
- 7) Penicillin was discovered in
a) 1952 b) 1928 c) 1934 d) 1926
- 8) How many total species are estimated in Siddha
a) 7500 - 9000 b) 1200 - 1500
c) 1340 - 1680 d) 1600 - 1900
- 9) which chemical constituent present in Vinca
a) vitamin - C b) vincristine
c) vinblastine d) both b and c
- 10) Who introduced isolation of Nicotine from Tobacco
a) Friedrich Adam b) Karl L. Reimann
c) Hardy d) Albert Niemann

Tutorial-02

Q1) Write in detail about Carbohydrates?

Ans: Some primary metabolites are

- Carbohydrates
 - Proteins and Enzymes
 - Lipids
- They are directly synthesized on plants which are widely distributed in nature
- They are involved in growth and development of plants
- 1) Carbohydrates
- These are the organic compounds made up of C, H and O found in living organisms
 - They are produced by photosynthesis in plants
 - It is a source of energy, carrying out normal functions such as growth, movement and metabolites.

• Test for carbohydrates

- 1) Molish test
- 2) Fehling's test
- 3) Benedict test
- 4) Iodine test



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• classification of carbohydrates

Sugars

- a) monosaccharides
- b) oligosaccharides
 - disaccharides
 - Trisaccharides
 - Tetrasaccharide

Non-sugars

- polysaccharide

a) Acacia

- Synonyms - Gum acacia, Babul
- Biological Source - obtained from stem and branches of acacia arabica
- family - Leguminosae
- Geological Source - India, Sri Lanka, Africa
- chemical constituents - It contains Arabin (mixture of calcium, magnesium and potassium salts of arabic acid)
- Morphological characters -
 - colour - cream, brown to red
 - odour - odourless
 - Taste - tasteless
 - shape - tear shape
 - Solubility - soluble in water

- preservation and storage - acacia is stored in air tight container in cool and dry place

• Uses -

- used as an emulsifying agent
- Act as a demulcent
- used as binding agent
- used in making candies, etc

b) Agar

- Synonyms - Agar Agar, Gelose, vegetable gelatin
- Biological - It is dried gelatinous substance obtained from Gelidium amansii
- family - Gelidaceae
- macroscopical :-
 - colour - yellowish, white
 - characters - odour - odourless
 - Taste: mucilaginous
 - Shape: Strips, flakes or coarse powder.
- chemical constituents:- It contains 2 different polysaccharides i.e agarose and agarpectin.



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10	Prepare 10 MCQ's on UNIT-II
11	Plant tissue culture and their Application
12	Edible vaccines
13	secondary metabolites
14	Plant Products
15	Prepare 10 MCQ's of each unit of III, IV and V

Academic Year 2021-22

BP301T. PHARMACEUTICAL ORGANIC CHEMISTRY –II (Theory)

Tutorial number	Tutorial Questions	
	A Division	B Division
1	MCQs on benzene topic	Describe orbital structure of Benzene
2	MCQs on heterocyclic compound	Write a note one reaction of Benzene
3	structure and uses of dichlorodiphenyl trichloroethane	Effect of monosubstituted on reactivity and orientation of Benzene
4	MCQs on phenol topic	Give in detail acidity of Phenol and Benzoic acid
5	discuss Acidity of phenol	Effect of substituent on basicity of Amine
6	Write MCQs on aromatic amines	Write down synthetic uses of aryl diazonium salts
7	Write MCQs on fats and oil topic	What is fats and oils give their differentiation with example
8	Draw Structure and uses of naphthalene	Write a note on saponification and rancidity of fats and oils
9	Write MCQs on naphthalene topic	Write a note on RM value and Iodine value



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10	Structure and uses of Anthracene	What is polynuclear hydrocarbon?, give the structural and medicinal uses of phenanthrene, anthracene, naphthalene.
11	Write MCQs on Anthracene topic	Draw the synthetic steps in detail of phenanthrene and anthracene
12	Structure and uses of phenanthrene	Write a note on diphenylmethane and triphenylmethane
13	MCQs on cycloalkane	Define cycloalkane, write down synthetic and preparation method of cyclopropane and cyclobutane
14	Write a note on Baeyer's strain theory	Explain in detail Baeyer's strain theory
15	Write in detail about Sachse Mohr's theory	Explain in detail Sachse Mohr's theory

BP302T. PHYSICAL PHARMACEUTICS-I (Theory)

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Set of multiple choice questions on Unit 1	1. Write in detail about braggs equation 2. Write in short about aerosol
2	Set of multiple choice questions on Unit 1	Write in detail about capillary rise method
3	Set of multiple choice questions on Unit 1	Define solubility saturated, supersaturated and unsaturated solution
4	Set of multiple choice questions on Unit 2	Classify measurement technique for surface and interfacial tension
5	Set of multiple choice questions on Unit 2	Define surface tension, interfacial tension and surface free energy



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6	Set of multiple choice questions on Unit 2	Classify the complex in pharmacy
7	Set of multiple choice questions on Unit 3	Enlist the applications of complexation
8	Set of multiple choice questions on Unit 3	Define latent heat and vapour pressure
9	Set of multiple choice questions on Unit 3	Define amorphous, polymorphism and crystalline structure
10	Set of multiple choice questions on Unit 4	Define optical rotation and dipole moment
11	Set of multiple choice questions on Unit 4	Draw a table of solubility expression
12	Set of multiple choice questions on Unit 4	Define solvation, ideal and real solution
13	Set of multiple choice questions on Unit 5	Write a statement of roult's law
14	Set of multiple choice questions on Unit 5	Describe henry's law
15	Set of multiple choice questions on Unit 5	Define pH, pOH



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BP 303 T. PHARMACEUTICAL MICROBIOLOGY (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
	Prepare 10 multiple choice questions (MCQs) with four options (Underline correct option)
1	Introduction, history of microbiology, its branches, scope and its importance, Introduction to Prokaryotes and Eukaryotes
2	Study of ultra-structure and morphological classification of bacteria, Nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve
3	Isolation and preservation methods for pure cultures, cultivation of anaerobes, quantitative measurement of bacterial growth (total & viable count)
4	Study of different types of phase contrast microscopy, dark field microscopy and electron microscopy
5	Identification of bacteria using staining techniques (Simple, Gram's & Acid fast staining) and biochemical tests (IMViC)
6	Study of principle, procedure, merits, demerits and applications of Physical, chemical and mechanical method of sterilization. Evaluation of the efficiency of sterilization methods, Sterility indicators
7	Study of morphology, classification, reproduction/replication and cultivation of Fungi. Classification and mode of action of disinfectants
8	Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions. Evaluation of bactericidal & bacteriostatic
9	Designing of aseptic area, laminar flow equipments; study of different sources of contamination in an aseptic area and methods of prevention, clean area



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	classification
10	Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids
11	Assessment of a new antibiotic and testing of antimicrobial activity of a new substance. General aspects-environmental cleanliness
12	Study of morphology, classification, reproduction/replication and cultivation of Virus
13	Types of spoilage, factors affecting the microbial spoilage of pharmaceutical products, sources and types of microbial contaminants, assessment of microbial contamination and spoilage
14	Preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations
15	Growth of animal cells in culture, general procedure for cell culture, Primary, established and transformed cell cultures. Applications of cell cultures in pharmaceutical industry and research

BP 304 T. PHARMACEUTICAL ENGINEERING (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
1	<ol style="list-style-type: none"> 1. Define mixing 2. Write statement of Bernoulli's theorem 3. Enlist the factors affecting rate of mixing 4. What is Reynolds number and write its equation 5. Draw a diagram of double cone blender
2	<ol style="list-style-type: none"> 1. Write mechanism and objectives of size reduction 2. Factors affecting size reduction



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	<ol style="list-style-type: none">3. Write principle, construction of sieve shaker4. Write principle and working of ball mill5. Write a note on official standard of powder
3	Write mechanism of drying process
4	<ol style="list-style-type: none">1. Define evaporation and factors affecting evaporation2. Write in short note on horizontal tube evaporator3. Define filtration and enlist factor affecting filtration4. Write a note on filter aids
5	Draw diagram of silverson emulsifier
6	Classify the equipment used for size reduction
7	Enlist the objectives of filtration
8	Draw a diagram of freeze dryer
9	Explain the principle of sieve shaker
10	Enlist the factors affecting mixing
11	Write in short note on simple distillation
12	Write selection criteria for filter media
13	Write short note on orifice meter
14	Write difference between evaporation of distillation
15	Draw a diagram of meta filter



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BP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III (Theory)

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Define & classify stereoisomer with example	Define geometric isomers and explain the method of nomenclature of geometric isomers
2	What do you mean by racemic mixture & racemic modification? Explain various methods of resolution of a racemic mixture.	Discuss the methods used to determine the configuration of geometrical isomers.
3	Give the various method for determination of geometrical isomers	What is racemic modification? Discuss the method of resolution of racemic modification.
4	Explain in detail the RS system of nomenclature of optical isomers.	Define configuration. Explain the sequence rule for R S and D L configuration?
5	What are stereoselectivity and stereospecificity? Explain it with a suitable example.	What are symmetric and asymmetric molecules? Explain asymmetric synthesis.
6	Explain the reaction & mechanism involved in Backmanns rearrangements.	What are heterocyclic compounds? give their systematic nomenclature and classification
7	Explain the reaction & mechanism involved in the Schmidt reaction.	give the methods of synthesis and chemical reaction of furan and thiophene
8	Explain synthesis, reactions & medicinal uses of furan	Explain the stereochemistry of biphenyls and conditions required for optical activity.
9	Explain synthesis, reactions & medicinal uses of thiophene	explain aromaticity and reactivity of furan, pyrrole and thiophene
10	Explain the synthetic method & two	write in detail Wolff-Kishner reduction



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	characteristic reactions for Imidazole & pyrrole	reaction
11	Give any two methods of preparation & chemical reaction of pyridine	explain the mechanism involve schmidt reaction
12	Explain the chemical reactions of Quinoline and Isoquinoline	write the Dakin reaction and its synthetic applications
13	Write a note on reactions and synthesis of Indole.	write a not on Claisen-Schmidt Condensation reaction
14	Write synthesis and medicinal uses of Pyrimidine.	write a note on Metal hydride reduction
15	Comment on electrophilic substitution in five-membered heterocycles.	Give in detail Oppenauer-oxidation

BP 403 T. PHYSICAL PHARMACEUTICS-II (Theory)

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Discuss general characteristics, shape & size of colloidal particles	Write a difference between molecular, colloidal and coarse dispersion
2	Write in detail classification of colloids	1. Enlist the method used for preparation of lyophobic colloids 2. What is tyndall effect
3	Note on Optical, Kinetic and Electrical properties of colloids	Write and difference between lyophilic and lyophobic colloids
4	Define rheology, explain newtons law of flow with rheogram	Describe in short about electrical double layer in colloids
5	Write a note on Non-Newtonian type of low with detail discussion	Define rheology and write in short about dilatant flow
6	Discuss plastic & elastic deformation,	Write Importance of rheology in

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	mention heckles equation	pharmaceutical industry
7	Write a note on stability aspects of suspensions	<ol style="list-style-type: none"> 1. Describe in short about elastic modules 2. Define plastic deformation and elastic deformation
8	Differentiate between flocculated & deflocculated suspensions	Define suspension and write its types
9	Discuss in detail various theories of emulsification	Prepare 5 mcqs with answers
10	Define micromeritics, write pharmaceutical applications of it	Write theories of emulsification
11	Write a note on different methods to determine particle size	Enlist the type of emulsion
12	Explain in detail various derived properties of powders	<ol style="list-style-type: none"> 1. Write a difference between suspension and emulsion 2. Enlist the identification method of emulsion 3. Define microemulsion
13	Explain different order reactions with suitable examples	Define micromeritics and enlist the method of determination of particle size
14	Explain different physical and chemical factors influencing chemical degradation of pharmaceutical products	Define bulk, true, tapped density and angle of repose
15	Write a note on accelerated stability	Define order of reaction and write a shelf



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	studies in detail	life and half-life equation of zero order reaction
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BP 404 T. PHARMACOLOGY-I (Theory)

Tutorial number	Tutorial Questions	
	A Division and B Division	
1	Define drug administration and explain in detail routes of drug administration	
2	Explain nature and sources of drug	
3	Define agonist and antagonist and explain antagonism in detail	
4	Define the following terms drug tolerance, drug dependence, drug habituation, idiosyncrasy, allergy	
5	Explain in detail drug absorption, bioavailability and bioequivalence	
6	What do you mean by drug distribution and explain the factors affecting	
7	Define ADR and explain its types	
8	Explain the synthesis, metabolism and release of acetylcholine	
9	Give the synthesis, release, pharmacological action of adrenaline in detail	
10	Explain mechanism, ADR, and uses of drug used in myasthenia gravis	
11	Define antiepileptics and classify alongwith the examples	
12	Write a detail note on anticholinesterase	
13	Classify local anaesthetics, explain mechanism and therapeutic uses of local anaesthetics	
14	What do you mean by analgesics and classify drugs used in painful conditions	
15	Discuss pharmacology of drugs used in parkinson's disease	



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BP 405 T.PHARMACOGNOSY AND PHYTOCHEMISTRY I (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
	Prepare 10 separate MCQs with solution on the following topics by individual student.
1	Definition, history and scope of Pharmacognosy
2	Sources of drugs, Organized and unorganized drugs
3	Classification of drugs
4	Adulteration of drugs
5	Evaluation of drugs by organoleptic and microscopic methods
6	Evaluation of drugs by chemical and biological methods
7	Factors affecting cultivation of medicinal plants
8	Plant hormones, polyploidy, mutation, hybridization
9	Plant tissue culture
10	Pharmacognosy in various system of medicine
11	Secondary metabolites
12	Plant fibres, Hallucinogens, Teratogens, Natural allergens
13	Carbohydrates
14	Proteins and enzymes
15	Lipids, Marine drugs




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BP301T. PHARMACEUTICAL ORGANIC CHEMISTRY –II (Theory)

Tutorial number	Tutorial Questions	
	A Division	B Division
1	MCQs on benzene topic	describe orbital structure of Benzene
2	MCQs on heterocyclic compound	write a note one reaction of Benzene
3	structure and uses of dichlorodiphenyl trichloroethane	effect of monosubstituted on reactivity and orientation of Benzene
4	MCQs on phenol topic	give in detail acidity of Phenol and Benzoic acid
5	Acidity of phenol	effect of substituent on basicity of Amine
6	MCQs on aromatic amines	write down synthetic uses of aryl diazonium salts
7	MCQs on fats and oil topic	what is fats and oils give their differentiation with example
8	Structure and uses of naphthalene	write a note on saponification and rancidity of fats and oils
9	MCQs on naphthalene topic	write a note on RM value and Iodine value
10	Structure and uses of Anthracene	What is polynuclear hydrocarbon?, give the structural and medicinal uses of phenanthrene, anthracene, naphthalene.
11	MCQs on Anthracene topic	draw the synthetic steps in detail of phenanthrene and anthracene
12	Structure and uses of phenanthrene	write a note on diphenylmethane and triphenylmethane
13	MCQs on cycloalkane	define cycloalkane, write down synthetic and preparation method of cyclopropane and cyclobutane



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14	Write a note on Baeyer's strain theory	explain in detail Baeyer's strain theory
15	Write in detail about Sachse Mohr's theory	explain in detail Sachse Mohr's theory

BP302T. PHYSICAL PHARMACEUTICS-I (Theory)

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Set of multiple choice questions on Unit 1	Set of multiple choice questions on Unit 1
2	Set of multiple choice questions on Unit 1	<p>Explain in detail DuNouy ring tensiometer method with diagram.</p> <p>b) Define a) Surface b) Interface c) Surface tension d) Interfacial tension</p> <p>c) Draw neat labelled diagram of apparatus for maximum bubble pressure method.</p> <p>d) Write a short note on surface tension with diagram.</p> <p>Que. 2: Solve any one out of two 08</p> <p>a) Enlist various methods to determine surface tension and interfacial tension. Explain in detail capillary rise method with diagram.</p> <p>b) Explain in detail about surface free energy and method to measure it.</p>
3	Set of multiple choice questions on Unit 1	Write down 20 MCQ questions with four options and tick correct answer on the unit 3 Surface and Interfacial phenomenon
4	Set of multiple choice questions on	Write 20 MCQ on unit 2 states of



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	Unit 2	matter
5	Set of multiple choice questions on Unit 2	Write down 20 MCQ questions with four options and tick correct answer on the unit 4 Complexation and protein binding.
6	Set of multiple choice questions on Unit 2	Set of multiple choice questions on Solubility of drugs
7	Set of multiple choice questions on Unit 3	Set of multiple choice questions on Solubility of drugs
8	Set of multiple choice questions on Unit 3	Set of multiple choice questions on States of Matter and properties of matter
9	Set of multiple choice questions on Unit 3	Set of multiple choice questions on Surface and interfacial phenomenon
10	Set of multiple choice questions on Unit 4	Set of multiple choice questions on Surface and interfacial phenomenon
11	Set of multiple choice questions on Unit 4	Set of multiple choice questions on Complexation and protein binding
12	Set of multiple choice questions on Unit 4	Set of multiple choice questions on Complexation and protein binding
13	Set of multiple choice questions on Unit 5	Set of multiple choice questions on pH, buffers and Isotonic solutions
14	Set of multiple choice questions on Unit 5	Set of multiple choice questions on pH, buffers and Isotonic solutions
15	Set of multiple choice questions on Unit 5	Set of multiple choice questions on pH, buffers and Isotonic solutions



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BP 303 T. PHARMACEUTICAL MICROBIOLOGY (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
	Prepare 10 multiple choice questions (MCQs) with four options (Underline correct option)
1	Introduction, history of microbiology, its branches, scope and its importance, Introduction to Prokaryotes and Eukaryotes
2	Study of ultra-structure and morphological classification of bacteria, Nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve
3	Isolation and preservation method for pure cultures, cultivation of anaerobes, quantitative measurement of bacterial growth (total & viable count)
4	Study of different types of phase contrast microscopy, dark field microscopy and electron microscopy
5	Identification of bacteria using staining techniques (Simple, Gram's & Acid fast staining) and biochemical tests (IMViC)
6	Study of principle, procedure, merits, demerits and applications of Physical, chemical and mechanical method of sterilization. Evaluation of the efficiency of sterilization methods, Sterility indicators
7	Study of morphology, classification, reproduction/replication and cultivation of Fungi. Classification and mode of action of disinfectants
8	Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions. Evaluation of bactericidal & bacteriostatic
9	Designing of aseptic area, laminar flow equipments; study of different sources of contamination in an aseptic area and methods of prevention, clean area classification



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10	Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids
11	Assessment of a new antibiotic and testing of antimicrobial activity of a new substance. General aspects-environmental cleanliness
12	Study of morphology, classification, reproduction/replication and cultivation of Virus
13	Types of spoilage, factors affecting the microbial spoilage of pharmaceutical products, sources and types of microbial contaminants, assessment of microbial contamination and spoilage
14	Preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations
15	Growth of animal cells in culture, general procedure for cell culture, Primary, established and transformed cell cultures. Application of cell cultures in pharmaceutical industry and research

BP 304 T. PHARMACEUTICAL ENGINEERING (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
1	Write a principle & draw a labelled diagram of FBD
2	Write a principle & draw a labelled diagram of lyophilizer
3	Write a principle & draw a labelled diagram of plate & frame filter
4	Write a principle & draw a labelled diagram of rotary drum filter
5	Write a principle & draw a labelled diagram of perforated basket centrifuge
6	Write a principle & draw a labelled diagram of fluid energy mill



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7	Write a principle & draw a labelled diagram of cyclone separator
8	Write a principle & draw a labelled diagram of ball mill
9	Write a principle & draw a labelled diagram of orifice metre
10	Write a principle & draw a labelled diagram of multiple effect evaporator
11	Write a principle & draw a labelled diagram of fractional distillation
12	Write a principle & draw a labelled diagram of steam distillation
13	Write a principle & draw a labelled diagram of twin shell blender
14	Write a principle & draw a labelled diagram of planetary mixers
15	Write a principle & draw a labelled diagram of Silverson Emulsifier

BP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
1	Define & classify stereoisomer with example
2	What do you mean by racemic mixture & racemic modification? Explain various methods of resolution of a racemic mixture.
3	Give the various method for determination of geometrical isomers
4	Explain in detail the RS system of nomenclature of optical isomers.
5	What are stereoselectivity and stereospecificity? Explain it with a suitable example.
6	Explain the reaction & mechanism involved in Backmanns rearrangements.
7	Explain the reaction & mechanism involved in the Schmidt reaction.
8	Explain synthesis, reactions & medicinal uses of furan
9	Explain synthesis, reactions & medicinal uses of thiophene
10	Explain the synthetic method & two characteristic reactions for Imidazole & pyrrole



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11	Give any two methods of preparation & chemical reaction of pyridine
12	Explain the chemical reactions of Quinoline and Isoquinoline
13	Write a note on reactions and synthesis of Indole.
14	Write synthesis and medicinal uses of Pyrimidine.
15	Comment on electrophilic substitution in five-membered heterocycles.

BP402T. MEDICINAL CHEMISTRY – I (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
1	1. Write in brief about Physicochemical Prop. 2. Explain Bioisosterism
2	1. Explain Sources of lead discovery 2. Explain geometrical isomerism
3	1. Explain factor affecting metabolism 2. Write about Phase 1 metabolism
4	Prepare 5 MCQ's on unit 1
5	1. Write about Sympatomimetic system 2. Biosynthesis of Adrenaline
6	1. Write synthesis of Epinephrine & Phenylephrine 2. Write SAR of Adrenaline
7	1. Explain the receptor & Physiological function of ACh 2. Explain the chemistry of ACh 3. Explain the SAR & MOA of cholinergic receptors
8	1. Write SAR of cholinergic antagonist drugs 2. Synthesis of Ipratropium bromide & dicycloamine



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9	Write about SAR of Barbiturates
10	1. SAR of Benzodiazepines 2. Write a note on cholinergic reactivators
11	Write the Classification of NSAID
12	Write the classification of narcotic analgesic
13	Write the classification of G.A
14	Write the stages of G.A
15	Prepare 5 MCQ's on Unit 5

BP 403 T. PHYSICAL PHARMACEUTICS-II (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
1	Discuss general characteristics, shape & size of colloidal particles
2	Write in detail classification of colloids
3	Note on Optical, Kinetic and Electrical properties of colloids
4	Define rheology, explain newtons law of flow with rheogram
5	Write a note on Non-Newtonian type of low with detail discussion
6	Discuss plastic & elastic deformation, mention heckles equation
7	Write a note on stability aspects of suspensions
8	Differentiate between flocculated & deflocculated suspensions
9	Discuss in detail various theories of emulsification
10	Define micromeritics, write pharmaceutical applications of it
11	Write a note on different methods to determine particle size



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12	Explain in detail various derived properties of powders
13	Explain different order reactions with suitable examples
14	Explain different physical and chemical factors influencing chemical degradation of pharmaceutical products
15	Write a note on accelerated stability studies in detail

BP 404 T. PHARMACOLOGY-I (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
1	Define pharmacology and give nature and sources of drug
2	Write in detail about routes of drug administration
3	Explain in detail about drug absorption
4	Write a detail note on Drug development and drug discovery
5	Explain the transmission, its types and neurotransmitters and cotransmitters.
6	Write a detail note on pharmacological actions, mechanism of action, therapeutic uses and adverse effect of Acetylcholine.
7	Write in detail about cholinergic transmission
8	Write a detail note on pharmacological actions, mechanism of action, therapeutic uses and adverse effect of Adrenaline
9	Write in detail about atropine as an anticholinergics
10	Write in detail about anticholinesterases
11	Write a detail note on pharmacological actions, mechanism of action, therapeutic uses and adverse effect of neuromuscular blockers
12	Write in detail about atropine as an General anesthetics
13	Write in detail about antiepileptic drugs
14	Write a detail note on Alcohol including its pharmacological actions, adverse effects, and uses
15	Write a detail note on antiparkinsonian drugs



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BP 405 T.PHARMACOGNOSY AND PHYTOCHEMISTRY I (Theory)

Tutorial number	Tutorial Questions
	A Division and B Division
	Prepare 5 separate MCQs with solution on the following topics by individual student
1	Definition, history and scope of Pharmacognosy
2	Sources of drugs, Organized and unorganized drugs
3	Classification of drugs
4	Adulteration of drugs
5	Evaluation of drugs by organoleptic and microscopic methods
6	Evaluation of drugs by chemical and biological methods
7	Factors affecting cultivation of medicinal plants
8	Plant hormones, polyploidy, mutation, hybridization
9	Plant tissue culture
10	Plant fibres
11	Carbohydrates
12	Proteins and enzymes
13	Lipids
14	Secondary metabolites
15	Pharmacognosy in various system of medicine



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List of Tutorials (T. Y. B. Pharmacy)

Academic Year 2022-23

BP501T- Medicinal Chemistry II – Theory

Tutorial number	Tutorial Questions	
	A Division (MSS)	B Division (MSS)
1	1. Explain the classification of H1 antagonist	1. Explain the classification of H1 antagonist
2	2. How H2 receptor antagonist forms its action 3. Explain SAR & Classification of H2 receptor antagonist	2. How H2 receptor antagonist forms its action 3. Explain SAR & Classification of H2 receptor antagonist
3	1. Explain PPT's	1. Explain PPT's
4	1. Explain the classification of anti-hypertensive agents 2. Explain ACE inhibitory	1. Explain the classification of anti-hypertensive agents 2. Explain ACE inhibitory
5	1. Explain the classification of Diuretics 2. Explain basic physiology of urine	1. Explain the classification of Diuretics 2. Explain basic physiology of urine
6	1. Explain the carbonic anhydrase inhibitors.	1. Explain the carbonic anhydrase inhibitors.
7	1. Which antineoplastic agent is a folic acid analogue	1. Which antineoplastic agent is a folic acid analogue
8	1. Write the classification of antianginal agents?	1. Write the classification of antianginal agents?
9	1. Explain vasodilator in angina	1. Explain vasodilator in angina
10	1. Explain the classification of antineoplastic agent? With MOA of any one class.	1. Explain the classification of antineoplastic agent? With MOA of any one class.
11	1. Explain purine analogues in anticancer therapy	1. Explain purine analogues in anticancer therapy
12	1. Explain the pathophysiology of arrhythmia	1. Explain the pathophysiology of arrhythmia
13	1. Explain the classification of LA	1. Explain the classification of LA
14	1. Explain SAR & MOA of LA	1. Explain SAR & MOA of LA

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15	1. Explain Diabetes Mellitus & it's type	2. Explain Diabetes Mellitus & it's type
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BP502T Industrial Pharmacy I– Theory

Tutorial number	Tutorial Questions	
	A Division (VKC)	B Division (RST)
1	Give objectives of preformulation studies	Give objectives of preformulation studies
2	Define polymorphism and molecular Adduct	Define polymorphism and molecular Adduct
3	Differentiate between crystalline and amorphous drug	Differentiate between crystalline and amorphous drug
4	Enlist analytical methods for characterization of solid drug	Enlist analytical methods for characterization of solid drug
5	Define hygroscopy and its methods	Define hygroscopy and its methods
6	Define PKa and Partition coefficient	Define PKa and Partition coefficient
7	Enlist the ideal properties of tablet excipients	Enlist the ideal properties of tablet excipients
8	Enlist various types and methods for	Enlist various types and methods for

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	preparation of tablet	preparation of tablet
9	Why tablets are still considered to be a formulation of choice among oral Preparations?	Why tablets are still considered to be a formulation of choice among oral Preparations?
10	Enlists the IPQC tests for tablets.	Enlists the IPQC tests for tablets.
11	Enlist unofficial test for tablet	Enlist unofficial test for tablet
12	Give classification of tablet	Give classification of tablet
13	Define tablet with suitable examples	Define tablet with suitable examples
14	Define Cmax and Tmax	How to prevent syrup crystallization
15	What is the difference between linear and non-linear PK?	enlist polymers in formulation of tablets

BP504T Pharmacognosy II – Theory

Tutorial number	Tutorial Questions	
	A Division (CJB)	B Division (CJB)
1	Write B.S., CC and uses of cinchona bark	Write B.S., CC and uses of cinchona bark

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	<p>Write identification test of cinchona bark</p> <p>Write morphological identification of different varieties of cinchona bark</p>	<p>Write identification test of cinchona bark</p> <p>Write morphological identification of different varieties of cinchona bark</p>
2	<p>Write B.S cinnamon bark</p> <p>Write morphological identification of cinnamon bark</p> <p>Write the microscopical diagnostic characteristics of cinnamon bark.</p>	<p>Write B.S cinnamon bark</p> <p>Write morphological identification of cinnamon bark</p> <p>Write the microscopical diagnostic characteristics of cinnamon bark.</p>
3	<p>Write B.S., CC and uses of senna leaf</p> <p>Write morphological identification of senna leaf</p> <p>Describe lamina of senna leaf</p> <p>Name the drug which contain sclerenchymatous sheath</p> <p>Write the microscopical diagnostic characteristics of senna leaves</p>	<p>Write B.S., CC and uses of senna leaf</p> <p>Write morphological identification of senna leaf</p> <p>Describe lamina of senna leaf</p> <p>Name the drug which contain sclerenchymatous sheath</p> <p>Write the microscopical diagnostic characteristics of senna leaves</p>
4	<p>Write B.S., CC and uses of clove bud</p> <p>Which type of oil glands present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p>	<p>Write B.S., CC and uses of clove bud</p> <p>Which type of oil glands present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p> <p>Write important morphological</p>



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	Write important morphological characteristics of clove bud.	characteristics of clove bud.
5	Write B.S., CC and uses of ephedra stem Which type of vascular bundle present in clove bud? Write the microscopical diagnostic characteristics of ephedra stem Write important morphological characteristics of ephedra stem	Write B.S., CC and uses of ephedra stem Which type of vascular bundle present in clove bud? Write the microscopical diagnostic characteristics of ephedra stem Write important morphological characteristics of ephedra stem
6	Write B.S., CC and uses of fennel fruit How many vittate and vascular bundle present in mericarp of fennel fruit? Write the microscopical diagnostic characteristics of fennel fruit Write important morphological characteristics of fennel fruit	Write B.S., CC and uses of fennel fruit How many vittate and vascular bundle present in mericarp of fennel fruit? Write the microscopical diagnostic characteristics of fennel fruit Write important morphological characteristics of fennel fruit
7	Write B.S., CC and uses of coriander fruit How many primary and secondary ridges present in mericarp of coriander fruit? Explain primary and secondary ridges (morphological	Write B.S., CC and uses of coriander fruit How many primary and secondary ridges present in mericarp of coriander fruit? Explain primary and secondary ridges (morphological characteristics) of



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	characteristics) of coriander fruit?	coriander fruit?
8	<p>Explain method of isolation of caffeine</p> <p>Draw the structure of caffeine</p> <p>Explain the role of solvent used in extraction of caffeine</p>	<p>Explain method of isolation of caffeine</p> <p>Draw the structure of caffeine</p> <p>Explain the role of solvent used in extraction of caffeine</p>
9	<p>Explain method of isolation of atropine</p> <p>Draw the structure of atropine</p> <p>Explain the role of solvent used in extraction of atropine</p>	<p>Explain method of isolation of atropine</p> <p>Draw the structure of atropine</p> <p>Explain the role of solvent used in extraction of atropine</p>
10	<p>Explain method of isolation of diosgenin</p> <p>Draw the structure of diosgenin</p> <p>Explain the role of solvent used in extraction of diosgenin</p>	<p>Explain method of isolation of diosgenin</p> <p>Draw the structure of diosgenin</p> <p>Explain the role of solvent used in extraction of diosgenin</p>
11	<p>Explain method of isolation of sennoside</p> <p>Draw the structure of sennoside</p> <p>Explain the role of solvent used in extraction of sennoside</p>	<p>Explain method of isolation of sennoside</p> <p>Draw the structure of sennoside</p> <p>Explain the role of solvent used in extraction of sennoside</p>
12	Explain theory and principle of	Explain theory and principle of TLC



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	TLC	
13	<p>Explain principle TLC eucalyptus oil (Stationary and mobile phase, Spray reagent, Rf value of constituents)</p> <p>Explain method of isolation of eucalyptus oil.</p> <p>Write Biological sources of eucalyptus oil</p>	<p>Explain principle TLC eucalyptus oil (Stationary and mobile phase, Spray reagent, Rf value of constituents)</p> <p>Explain method of isolation of eucalyptus oil.</p> <p>Write Biological sources of eucalyptus oil</p>
14	<p>Write BS CC and uses of asafoetida, benzoin, colophony, myrrh, aloe</p> <p>Write identification test of asafoetida, benzoin, colophony, myrrh, aloe</p>	<p>Write BS CC and uses of asafoetida, benzoin, colophony, myrrh, aloe</p> <p>Write identification test of asafoetida, benzoin, colophony, myrrh, aloe</p>
15	<p>Give the principle of separation of sugars by paper chromatography</p> <p>Define Rf value</p>	<p>Give the principle of separation of sugars by paper chromatography</p> <p>Define Rf value</p>

BP505T- Pharmaceutical Jurisprudence –Theory

Tutorial number	Tutorial Questions	
	A Division VSB	B Division VSB
1	Give the objective of Pharmacy Act	Give the objective of Pharmacy Act

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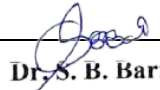


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2	Prepare the pharmacy act related case Study based on true incidence	Prepare the pharmacy act related case Study based on true incidence
3	Give the objective of D& C Act and	Give the objective of D& C Act and
4	Prepare the D & C related case Study based on true incidence	Prepare the D & C related case Study based on true incidence
5	Write in detail. Schdule M	Write in detail. Schdule M
6	Write in detail. Schdule N and P	Write in detail. Schdule N and P
7	Discuss in details. Sale of Drug	Discuss in details. Sale of Drug
8	Discuss in brief DTAB committee	Discuss in brief DTAB committee
9	Write objective Narcotic and psychotropic substance	Write objective Narcotic and psychotropic substance
10	Prepare the Nacotic and psychotropic substance related case Study based on true incidence	Prepare the Nacotic and psychotropic substance related case Study based on true incidence
11	Give the objective animal curely act	Give the objective animal curely act
12	Write in detail RTI Act	Write in detail RTI Act
13	Write objective medicinal toilet preparation act	Write objective medicinal toilet preparation act
14	Prepare the medicinal toilet preparation act related case Study based on true incidence	Prepare the medicinal toilet preparation act related case Study based on true incidence
15	Write in detail IPR	Write in detail IPR




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BP601T Medicinal Chemistry III – Theory

Tutorial number	Tutorial Questions	
	A Division (HTJ)	B Division (PSD)
1	1) Define Antibiotics with examples. Draw the structure of penicillin V & penicillin G. 2) Give the chemistry of penicillin. 3) Draw the structure of Amoxicillin & Ampicillin.	Classify antibiotics on the basis of MOA?
2	1) Give the chemistry of tetracycline. 2) Give the structure of Azithromycin. 3) Give the MOA of Aminoglycosides.	Classify antibiotics on the basis of Structure?
3	Explain the SAR of Penicillin	Classify β -lactum antibiotics ?
4	Define prodrug with example & give applications of prodrug	Classify penicillin antibiotics?
5	Give the structure, chemistry, & MOA of Chloramphenicol	Classify Cephalosporin antibiotics?
6	Define antimalarial agents. Draw the life cycle of malaria.	Give the synthesis of Chloramphenicol & Chloroquine?
7	Give the classification of cephalosporin & Explain it	Write the synthesis of Pamaquine & Isoniazid
8	Synthesis of chloroquine & pamaquine.	Give the synthesis of p-amino-salicylic acid & ciprofloxacin
9	Define antitubercular agents & write their classification.	Write the synthesis of Dapsone & Trimethoprim



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10	Do the outline synthesis of PAS & Isoniazid.	Give the synthesis of Sulfamethoxazole & Nitrofurantoin
11	Define Antiviral agents with example & Draw the structure of Acyclovir & Amantadine HCL.	Write the synthesis of Acyclovir & Miconazole
12	Define Antifungal agents with example & draw the structure of Miconazole & Tolnaftate.	Give the synthesis of Tolnaftate & Mebendazole
13	Draw the structure of Rifamycin- B	Write the synthesis of Sulfacaetamide
14	Define antiprotozoal agents & Antihelmintics.	Give the synthesis of Metronidazole
15	1)What is drug design & What Is QSAR. 2)Give the applications of combinatorial chemistry.	Write the synthesis of Diethyl carbamazine citrate

BP602T Pharmacology III – Theory

Tutorial number	Tutorial Questions	
	A Division (RTD)	B Division (RTD)
1	What is mean by Ulcer? Give the classification of antiulcer agents. Explain in brief H2 antagonist.	What is mean by Ulcer? Give the classification of antiulcer agents. Explain in brief H2 antagonist.
2	What is constipation and diarrhoea ? Give the Classification of laxative and explain bulk forming agents.	What is constipation and diarrhoea ? Give the Classification of laxative and explain bulk forming agents.
3	Define Asthma. Classify antiasthmatic agents and explain Methyl xanthines.	Define Asthma. Classify antiasthmatic agents and explain Methyl xanthines.

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4	Define Leprosy and classify it. Explain Sulphone derivative.	Define Leprosy and classify it. Explain Sulphone derivative.
5	Define Antibiotics and Explain in brief Penicillin G with MOA, kinetics, AE, uses.	Define Antibiotics and Explain in brief Penicillin G with MOA, kinetics, AE, uses.
6	Define Chemotherapy and Explain in brief Fluroquinolones.	Define Chemotherapy and Explain in brief Fluroquinolones.
7	What is TB? Give classification and explain any one drug.	What is TB? Give classification and explain any one drug.
8	What is viral infection. Give classification of antiviral drugs. Explain any one drug from antiamoebic agents.	What is viral infection. Give classification of antiviral drugs. Explain any one drug from antiamoebic agents.
9	What is Anthelmintics. Give it classification. Explain one drug from antileprotic.	What is Anthelmintics. Give it classification. Explain one drug from antileprotic.
10	Classify UTI and explain one drug of any one class.	Classify UTI and explain one drug of any one class.
11	What is Malignancy. Classify cytotoxic drugs and explain one drug from Harmonal agents.	What is Malignancy. Classify cytotoxic drugs and explain one drug from Harmonal agents.
12	Define Immunostimulant, Immunosuppressant classify protein drugs and explain one drug.	Define Immunostimulant, Immunosuppressant classify protein drugs and explain one drug.
13	Define Chronopharmacology, rhythm, cycle, and biological clock and explain chronotherapy of any two disease.	Define Chronopharmacology, rhythm, cycle, and biological clock and explain chronotherapy of any two disease.
14	Define acute, subacute, chronic toxicity, genotoxicity, carcinogenicity, teratogenicity and mutagenicity.	Define acute, subacute, chronic toxicity, genotoxicity, carcinogenicity, teratogenicity and mutagenicity.
15	Explain in brief treatment of poisoning.	Explain in brief treatment of poisoning.

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BP603T Herbal Drug Technology –Theory

Tutorial number	Tutorial Questions	
	A Division (CJB)	B Division (CJB)
1	<p>Write B.S., CC and uses of cinchona bark</p> <p>Write identification test of cinchona bark</p> <p>Write morphological identification of different varieties of cinchona bark</p>	<p>Write B.S., CC and uses of cinchona bark</p> <p>Write identification test of cinchona bark</p> <p>Write morphological identification of different varieties of cinchona bark</p>
2	<p>Write B.S cinnamon bark</p> <p>Write morphological identification of cinnamon bark</p> <p>Write the microscopical diagnostic characteristics of cinnamon bark.</p>	<p>Write B.S cinnamon bark</p> <p>Write morphological identification of cinnamon bark</p> <p>Write the microscopical diagnostic characteristics of cinnamon bark.</p>
3	<p>Write B.S., CC and uses of senna leaf</p> <p>Write morphological identification of senna leaf</p> <p>Describe lamina of senna leaf</p> <p>Name the drug which contain sclerenchymatous sheath</p> <p>Write the microscopical diagnostic</p>	<p>Write B.S., CC and uses of senna leaf</p> <p>Write morphological identification of senna leaf</p> <p>Describe lamina of senna leaf</p> <p>Name the drug which contain sclerenchymatous sheath</p> <p>Write the microscopical diagnostic characteristics of senna leaves</p>



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	characteristics of senna leaves	
4	<p>Write B.S., CC and uses of clove bud</p> <p>Which type of oil glands present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p> <p>Write important morphological characteristics of clove bud.</p>	<p>Write B.S., CC and uses of clove bud</p> <p>Which type of oil glands present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p> <p>Write important morphological characteristics of clove bud.</p>
5	<p>Write B.S., CC and uses of ephedra stem</p> <p>Which type of vascular bundle present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p> <p>Write important morphological characteristics of ephedra stem</p>	<p>Write B.S., CC and uses of ephedra stem</p> <p>Which type of vascular bundle present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p> <p>Write important morphological characteristics of ephedra stem</p>
6	<p>Write B.S., CC and uses of fennel fruit</p> <p>How many vittate and vascular bundle present in mericarp of fennel fruit?</p> <p>Write the microscopical diagnostic characteristics of fennel fruit</p> <p>Write important morphological</p>	<p>Write B.S., CC and uses of fennel fruit</p> <p>How many vittate and vascular bundle present in mericarp of fennel fruit?</p> <p>Write the microscopical diagnostic characteristics of fennel fruit</p> <p>Write important morphological</p>



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	characteristics of fennel fruit	characteristics of fennel fruit
7	<p>Write B.S., CC and uses of coriander fruit</p> <p>How many primary and secondary ridges present in mericarp of coriander fruit?</p> <p>Explain primary and secondary ridges (morphological characteristics) of coriander fruit?</p>	<p>Write B.S., CC and uses of coriander fruit</p> <p>How many primary and secondary ridges present in mericarp of coriander fruit?</p> <p>Explain primary and secondary ridges (morphological characteristics) of coriander fruit?</p>
8	<p>Explain method of isolation of caffeine</p> <p>Draw the structure of caffeine</p> <p>Explain the role of solvent used in extraction of caffeine</p>	<p>Explain method of isolation of caffeine</p> <p>Draw the structure of caffeine</p> <p>Explain the role of solvent used in extraction of caffeine</p>
9	<p>Explain method of isolation of atropine</p> <p>Draw the structure of atropine</p> <p>Explain the role of solvent used in extraction of atropine</p>	<p>Explain method of isolation of atropine</p> <p>Draw the structure of atropine</p> <p>Explain the role of solvent used in extraction of atropine</p>
10	<p>Explain method of isolation of diosgenin</p> <p>Draw the structure of diosgenin</p> <p>Explain the role of solvent used in</p>	<p>Explain method of isolation of diosgenin</p> <p>Draw the structure of diosgenin</p> <p>Explain the role of solvent used in</p>



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	extraction of diosgenin	extraction of diosgenin
11	<p>Explain method of isolation of sennoside</p> <p>Draw the structure of sennoside</p> <p>Explain the role of solvent used in extraction of sennoside</p>	<p>Explain method of isolation of sennoside</p> <p>Draw the structure of sennoside</p> <p>Explain the role of solvent used in extraction of sennoside</p>
12	<p>Explain theory and principle of TLC</p>	<p>Explain theory and principle of TLC</p>
13	<p>Explain principle TLC eucalyptus oil (Stationary and mobile phase, Spray reagent, Rf value of constituents)</p> <p>Explain method of isolation of eucalyptus oil.</p> <p>Write Biological sources of eucalyptus oil</p>	<p>Explain principle TLC eucalyptus oil (Stationary and mobile phase, Spray reagent, Rf value of constituents)</p> <p>Explain method of isolation of eucalyptus oil.</p> <p>Write Biological sources of eucalyptus oil</p>
14	<p>Write BS CC and uses of asafoetida, benzoin, colophony, myrrh, aloe</p> <p>Write identification test of asafetida, benzoin, colophony, myrrh, aloe</p>	<p>Write BS CC and uses of asafoetida, benzoin, colophony, myrrh, aloe</p> <p>Write identification test of asafetida, benzoin, colophony, myrrh, aloe</p>
15	<p>Give the principle of separation of sugars by paper chromatography</p>	<p>Give the principle of separation of sugars by paper chromatography</p>



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	Define Rf value	Define Rf value
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BP604T Biopharmaceutics and Pharmacokinetics – Theory

Tutorial number	Tutorial Questions	
	A Division (VKC)	B Division (RST)
1	Draw a typical plasma concentration time profile curve	Draw a typical plasma concentration time profile curve
2	Enlist factors affecting drug absorption	Enlist factors affecting drug absorption
3	Draw a figure of mechanism of drug transport	Draw a figure of mechanism of drug transport
4	Explain Dissolution theories in details	Explain Dissolution theories in details
5	Draw a table on BCS classification of drugs	Draw a table on BCS classification of drugs
6	Define volume of administration and how do you determine Vd ?	Define volume of administration and how do you determine Vd ?
7	Enlist the renal and non-renal excretion	Enlist the renal and non-renal excretion
8	Draw a diagram of Phase-I and Phase-II	Draw a diagram of Phase-I and Phase-II

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	reaction of drug metabolism	reaction of drug metabolism
9	Draw the Structure of Cell membrane	Draw the Structure of Cell membrane
10	What do you understand by pharmacokinetic model ?	What do you understand about the pharmacokinetic model ?
11	How do you estimate Km and Vmax	How do you estimate Km and Vmax
12	Define bioavailability. Mention the objectives of bioavailability studies.	Define bioavailability. Mention the objectives of bioavailability studies.
13	Define bioequivalence and types of equivalence.	Define bioequivalence and types of equivalence.
14	Define Cmax and Tmax	Define Cmax and Tmax
15	What is the difference between linear and non-linear PK?	What is the difference between linear and non-linear PK?




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BP605T Pharmaceutical Biotechnology–Theory

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Flow chart of rDNA technology.	Flow chart of rDNA technology.
2	Flow chart of Insulin production.	Flow chart of Insulin production.
3	Flow chart of Interferon production.	Flow chart of Interferon production.
4	Flow chart of HB vaccine.	Flow chart of HB vaccine.
5	Flow chart of PCR.	Flow chart of PCR.
6	Flow chart of Penicillin production.	Flow chart of Penicillin production.
7	Diagram of bacterial transduction mechanism.	Diagram of bacterial transduction mechanism.
8	Flow chart of hybridoma technology	Flow chart of hybridoma technology
9	Structure of class I and II MHC molecules.	Structure of class I and II MHC molecules.
10	Flow chart of cellular immunity.	Flow chart of cellular immunity.

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11	General method of preparation of bacterial vaccine.	General method of preparation of bacterial vaccine.
12	ELISA diagram- Direct method	ELISA diagram- Direct method
13	ELISA diagram- Indirect method	ELISA diagram- Indirect method
14	Flow chart of Western Blot.	Flow chart of Western Blot.
15	Flow chart of Northern Blot.	Flow chart of Northern Blot.

BP606T Quality Assurance– Theory

Tutorial number	Tutorial Questions	
	A Division (DMP)	B Division (SMM)
1	Define QA & QC & give responsibilities of QA & QC.	Write in detail about QA & QC with its importance, role, responsibility and difference.
2	Define TQM & explain elements of TQM.	Define TQM & explain in detail.
3	What is ICH & give process of harmonization in flow chart.	Define QbD. Give reasons on elements of QbD program.
4	Enlist quality guidelines of ICH.	Discuss in brief about ISO certification for the pharmaceutical industry.
5	Write a short note on QBD.	Explain in brief the accreditation process of NABL certification.
6	What is ISO & give details overview of ISO 14000.	Define P'ceutical organization with a brief chart.

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7	Write in detail the accreditation process of NABL.	Explain in brief premises of pharmaceutical industries.
8	Give the responsibilities of key personnel.	IPQC for packaging material. Glass, Rubber, Plastic.
9	Give quality control test for plastic container for non parenteral preparation	Define P'ceutical complaints and classify them. Write a note on the complaint and handling process.
10	Define complaints & give procedure for humidity & evaluation of complaints	Define validation. Enlist types of validation. Explain in detail analytical validation.
11	Define quality audit & give types of quality audit	Define GLP. Write a note on the facility involved in it.
12	Difference between calibration & validation	MCQ- Calibration and Validation
13	Give calibration of pH meter	MCQ- ICH
14	Give details about MFR	MCQ- TQM & QbD
15	Give details about the area in warehousing.	MCQ- ISO, QA & QC

Academic Year 2021-22

BP501T- Medicinal Chemistry II – Theory

Tutorial number	B Division (MSS)
1	1. Explain the classification of H1 antagonist
2	1. How H2 receptor antagonist forms it's action 2. Explain SAR & Classification of H2 receptor antagonist
3	1. Explain PPI's
4	1. Explain the classification of anti-hypertensive agents 2. Explain ACE inhibitore

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5	1. Explain the classification of Diuretics 2. Explain basic physiology of urine
6	1. Explain the carbonic anhydrase inhibitors.
7	1. Which antineoplastic agent is a folic acid analogue
8	1. Write the classification of antianginal agents?
9	1. Explain vasodilator in angina
10	1. Explain the classification of antineoplastic agent? With MOA of any one class.
11	1. Explain purine analogues in anticancer therapy
12	1. Explain the pathophysiology of arrhythmia
13	1. Explain the classification of LA
14	1. Explain SAR & MOA of LA
15	1. Explain Diabetes Mellitus & its type

BP502T Industrial PharmacyI– Theory

Tutorial number	Tutorial Questions	
	A Division(VKC)	B Division (RST)
1	Give objectives of preformulation studies	Define hygroscopy and delinquency
2	Define polymorphism and molecular Adduct	Define PKa and Partition coefficient
3	Differentiate between crystalline and amorphous drug	Define polymorphism and molecular Adduct



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4	Enlist analytical methods for characterization of solid drug	Define tablet with suitable examples
5	Define hygroscopy and its methods	Differentiate between crystalline and amorphous drug
6	Define PKa and Partition coefficient	Enlist analytical methods for characterization of solid drug
7	Enlist the ideal properties of tablet excipients	enlist polymers in formulation of tablets
8	Enlist various types and methods for preparation of tablet	Enlist the ideal properties of tablet excipients
9	Why tablets are still considered to be a formulation of choice among oral Preparations?	Enlist unofficial test for tablet
10	Enlists the IPQC tests for tablets.	Enlist various types and methods for preparation of tablet
11	Enlist unofficial test for tablet	Enlists the IPQC tests for tablets.
12	Give classification of tablet	Give classification of tablet

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13	Define tablet with suitable examples	Give objectives of preformulation studies
14	Define Cmax and Tmax	How to prevent syrup crystallization
15	What is the difference between linear and non-linear PK?	Why tablets are still considered to be a formulation of choice among oral Preparations?

BP503T Pharmacology II – Theory

Tutorial number	B Division (SKP)
1	<ol style="list-style-type: none">1. Explain oral hypoglycemic agent in detail.2. Write a note on histamine, leukotrienes
2	<ol style="list-style-type: none">1. Enlist the classification of NSAID and explain Pharmacology of salicylate.2. Write about Vit D.
3	<ol style="list-style-type: none">1. Enlist the classification of antiplatelet agent and explain MOA, adverse effects and therapeutic uses of Aspirin, abciximab and clopidogrel.2. Write a short notes on calcitonin hormone
4	<ol style="list-style-type: none">1. Enlist the classification of diuretic and explain pharmacology of thiazide diuretics and carbonyl anhydrase inhibitors with suitable examples.2. Write about parathyroid hormone

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5	<ol style="list-style-type: none">1. Define autocooids and write about angiotensin and bradykinin2. Explain antidiuretics in detail.
6	<ol style="list-style-type: none">1. Enlist the classification of shock and describe its treatment in detail.2. Write a note on coagulants.
7	<ol style="list-style-type: none">1. Enlist the classification of antigout drugs and explain MOA, adverse effects and therapeutic uses of allopurinol and probencid.2. Describe thyroid hormone synthesis in detail.
8	<ol style="list-style-type: none">1. Classify antihyperlipidemic agents in detail.2. Give comments on digitalis toxicity.
9	<ol style="list-style-type: none">1. Enlist the classification of antianginal drugs and explain pharmacological action of nitrate with suitable examples.2. What is the significance of b-blockers used in angina?
10	<ol style="list-style-type: none">1. Enlist the classification of antihypertensive agents and explain MOA of ACE inhibitors and b-blockers.2. Write a note on AT1 receptor antagonist and direct renin inhibitor.
11	<ol style="list-style-type: none">1. Describe MOA of antiarrhythmic agents.2. Write a note on plasma volume expander.
12	<ol style="list-style-type: none">1. Explain MOA, adverse effects and therapeutic uses of hormone synthesis inhibitors and iodine trapping inhibitors.2. Describe MOA, adverse effects of streptokinase.



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13	<ol style="list-style-type: none"> 1. Explain pharmacological action of digoxin in detail. 2. Describe potassium channel opener in detail
14	<ol style="list-style-type: none"> 1. Describe MOA of calcium channel blocker and vasodilators. 2. Explain vasodilators in treatment of CHF.
15	<ol style="list-style-type: none"> 1. Write a note on glucocorticoid. 2. Write in brief about ACE inhibitors in CHF.

BP504T Pharmacognosy II – Theory

Tutorial number	Tutorial Questions	
	A Division (CJB)	B Division (CJB)
1	<p>Write B.S., CC and uses of cinchona bark</p> <p>Write identification test of cinchona bark</p> <p>Write morphological identification of different varieties of cinchona bark</p>	<p>Write B.S., CC and uses of cinchona bark</p> <p>Write identification test of cinchona bark</p> <p>Write morphological identification of different varieties of cinchona bark</p>
2	<p>Write B.S cinnamon bark</p> <p>Write morphological identification of cinnamon bark</p> <p>Write the microscopical diagnostic characteristics of cinnamon bark.</p>	<p>Write B.S cinnamon bark</p> <p>Write morphological identification of cinnamon bark</p> <p>Write the microscopical diagnostic characteristics of cinnamon bark.</p>

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<p>3</p>	<p>Write B.S., CC and uses of seena leaf</p> <p>Write morphological identification of senna leaf</p> <p>Describe lamina of senna leaf</p> <p>Name the drug which contain sclerenchymatous sheath</p> <p>Write the microscopical diagnostic characteristics of senna leaves</p>	<p>Write B.S., CC and uses of seena leaf</p> <p>Write morphological identification of senna leaf</p> <p>Describe lamina of senna leaf</p> <p>Name the drug which contain sclerenchymatous sheath</p> <p>Write the microscopical diagnostic characteristics of senna leaves</p>
<p>4</p>	<p>Write B.S., CC and uses of clove bud</p> <p>Which type of oil glands present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p> <p>Write important morphological characteristics of clove bud.</p>	<p>Write B.S., CC and uses of clove bud</p> <p>Which type of oil glands present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p> <p>Write important morphological characteristics of clove bud.</p>
<p>5</p>	<p>Write B.S., CC and uses of ephedra stem</p> <p>Which type of vascular bundle present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p> <p>Write important morphological characteristics of ephedra stem</p>	<p>Write B.S., CC and uses of ephedra stem</p> <p>Which type of vascular bundle present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p> <p>Write important morphological characteristics of ephedra stem</p>



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<p>6</p>	<p>Write B.S., CC and uses of fennel fruit</p> <p>How many vittate and vascular bundle present in mericarp of fennel fruit?</p> <p>Write the microscopical diagnostic characteristics of fennel fruit</p> <p>Write important morphological characteristics of fennel fruit</p>	<p>Write B.S., CC and uses of fennel fruit</p> <p>How many vittate and vascular bundle present in mericarp of fennel fruit?</p> <p>Write the microscopical diagnostic characteristics of fennel fruit</p> <p>Write important morphological characteristics of fennel fruit</p>
<p>7</p>	<p>Write B.S., CC and uses of coriander fruit</p> <p>How many primary and secondary ridges present in mericarp of coriander fruit?</p> <p>Explain primary and secondary ridges (morphological characteristics) of coriander fruit?</p>	<p>Write B.S., CC and uses of coriander fruit</p> <p>How many primary and secondary ridges present in mericarp of coriander fruit?</p> <p>Explain primary and secondary ridges (morphological characteristics) of coriander fruit?</p>
<p>8</p>	<p>Explain method of isolation of caffeine</p> <p>Draw the structure of caffeine</p> <p>Explain the role of solvent used in extraction of caffeine</p>	<p>Explain method of isolation of caffeine</p> <p>Draw the structure of caffeine</p> <p>Explain the role of solvent used in extraction of caffeine</p>
<p>9</p>	<p>Explain method of isolation of atropine</p> <p>Draw the structure of atropine</p>	<p>Explain method of isolation of atropine</p> <p>Draw the structure of atropine</p>



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	Explain the role of solvent used in extraction of atropine	Explain the role of solvent used in extraction of atropine
10	Explain method of isolation of diosgenin Draw the structure of diosgenin Explain the role of solvent used in extraction of diosgenin	Explain method of isolation of diosgenin Draw the structure of diosgenin Explain the role of solvent used in extraction of diosgenin
11	Explain method of isolation of sennoside Draw the structure of sennoside Explain the role of solvent used in extraction of sennoside	Explain method of isolation of sennoside Draw the structure of sennoside Explain the role of solvent used in extraction of sennoside
12	Explain theory and principle of TLC	Explain theory and principle of TLC
13	Explain principle TLC eucalyptus oil (Stationary and mobile phase, Spray reagent, Rf value of constituents) Explain method of isolation of eucalyptus oil. Write Biological sources of eucalyptus oil	Explain principle TLC eucalyptus oil (Stationary and mobile phase, Spray reagent, Rf value of constituents) Explain method of isolation of eucalyptus oil. Write Biological sources of eucalyptus oil
14	Write BS CC and uses of asafoetida, benzoin, colophony,	Write BS CC and uses of asafoetida,



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	myrrh, aloe Write identification test of asafetida, benzoin, colophony, myrrh, aloe	benzoin, colophony, myrrh, aloe Write identification test of asafetida, benzoin, colophony, myrrh, aloe
15	Give the principle of separation of sugars by paper chromatography Define Rf value	Give the principle of separation of sugars by paper chromatography Define Rf value

BP505T- Pharmaceutical Jurisprudence –Theory

Tutorial number	Tutorial Questions	
	A Division (VSB)	B Division (VSB)
1	Give the objective of Pharmacy Act	Give the objective of Pharmacy Act
2	Prepare the pharmacy act related case Study based on true incidence	Prepare the pharmacy act related case Study based on true incidence
3	Give the objective of D& C Act and	Give the objective of D& C Act and
4	Prepare the D & C related case Study based on true incidence	Prepare the D & C related case Study based on true incidence
5	Write in detail. Schdule M	Write in detail. Schdule M
6	Write in detail. Schdule N and P	Write in detail. Schdule N and P
7	Discuss in details. Sale of Drug	Discuss in details. Sale of Drug
8	Discuss in brief DTAB committee	Discuss in brief DTAB committee
9	Write objective Narcotic and psychotropic substance	Write objective Narcotic and psychotropic substance



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10	Prepare the Narcotic and psychotropic substance related case Study based on true incidence	Prepare the Narcotic and psychotropic substance related case Study based on true incidence
11	Give the objective animal curely act	Give the objective animal curely act
12	Write in detail RTI Act	Write in detail RTI Act
13	Write objective medicinal toilet preparation act	Write objective medicinal toilet preparation act
14	Prepare the medicinal toilet preparation act related case Study based on true incidence	Prepare the medicinal toilet preparation act related case Study based on true incidence
15	Write in detail DPCO act	Write in detail DPCO act

BP601T Medicinal Chemistry III – Theory

Tutorial number	B Division(MSS)
1	Write the history of antibiotics
2	Write the classification of β lactam antibiotics
3	Write in brief about aminoglycosides & tetracyclines
4	Explain about macrolide antibiotic
5	Write the application of prodrug
6	Write about life cycle of malaria
7	Classify antitubercular agents
8	Explain the SAR of quinolones
9	Write in brief about viral replication cycle
10	Classify antifungal agents.

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11	What is sulphonamide & write its classification
12	Write in brief about cotrimoxazole
13	What is QSAR. Write its types
14	Explain molecular docking
15	Write about combinatorial synthesis

BP602T Pharmacology III – Theory

Tutorial number	A Division (SKP)
1	<ol style="list-style-type: none"> 1. Classify immunosuppressants with examples. 2. State clinical uses of immunosuppressants. 3. Enlist adverse effects of immunosuppressants and describe pharmacology of immunosuppressants.
2	<ol style="list-style-type: none"> 1. Describe pharmacology of immunostimulants. 2. Discuss the molecular basis of chemotherapy and write about cotrimoxazole? 3. Explain pharmacology of sulphonamides.
3	<ol style="list-style-type: none"> 1. Write note on beta lactum antibiotics. 2. Describe pharmacology of penicillins. 3. Describe pharmacology of cephalosporins.
4	<ol style="list-style-type: none"> 1. Comment on penicillinase resistant penicillins. 2. Comment on antibiotic resistance. 3. Discuss pharmacology of tetracyclines.
5	<ol style="list-style-type: none"> 1. Explain pharmacology of chloramphenicol. 2. State adverse effects and clinical uses of tetracyclines. 3. Discuss pharmacology of gentamycin.




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6	<ol style="list-style-type: none">1. State MOA of aminoglycoside antibiotics.2. Write a note on macrolide antibiotics.3. Comment on polyenes and polypeptide antibiotics.
7	<ol style="list-style-type: none">1. Discuss the pharmacology of quinolones.2. Write notes on fluroquinolones.3. Describe chemotherapy of tuberculosis.
8	<ol style="list-style-type: none">1. Describe chemotherapy of leprosy.2. State MOA of amphotericin B?3. Explain pharmacology of nystatin.
9	<ol style="list-style-type: none">1. Write a note on antifungal antibiotics.2. Describe the pharmacology of antiviral drugs.3. Classify antimalarial drugs and state MOA of chloroquine.
10	<ol style="list-style-type: none">1. Describe pharmacotherapy of malaria.2. Describe pharmacotherapy of amoebiasis.3. Define and classify anthelmintic drugs.
11	<ol style="list-style-type: none">1. Describe the pharmacotherapy of cancer.2. Discuss the life cycle of malaria parasites.3. Define and enlist types of toxicity studies.
12	<ol style="list-style-type: none">1. Explain general principles of toxicology2. Explain acute and chronic toxicity3. Discuss about mercury poisoning.
13	<ol style="list-style-type: none">1. Explain rhythm and cycles2. Write notes on biological clock and their significance leading to chronotherapy.3. Discuss management of barbiturates poisoning.
14	<ol style="list-style-type: none">1. Explain drug acting on UTI.



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	2. Discuss teratogenicity 3. Write about general principles of treatment of poisoning.
15	1. Classify antiamoebic agents and explain pharmacology of any one category. 2. Classify anthelmintics agents and explain pharmacology of any one category. 3. Discuss treatment of constipation.

BP603T Herbal Drug Technology –Theory

Tutorial number	Tutorial Questions	
	A Division (CJB)	B Division(CJB)
1	Write in detail about Good agriculture practices in cultivation of medicinal plants.	Write in detail about Good agriculture practices in cultivation of medicinal plants.
2	Write the various sources of herbs. Discuss selection, identification and authentication of herbal materials.	Write the various sources of herbs. Discuss selection, identification and authentication of herbal materials.
3	What is nutraceuticals? Classify them. Write health benefit and role of nutraceuticals in ailments of various disease.	What is nutraceuticals? Classify them. Write health benefit and role of nutraceuticals in ailments of various disease.
4	Define herb-drug and herb-food interaction. Write its classification and possible side effects and interaction of hypericum and garlic.	Define herb-drug and herb-food interaction. Write its classification and possible side effects and interaction of hypericum and garlic.
5	What are herbal excipients? Write its significance and properties of colorant, sweeteners, binders with suitable examples.	What are herbal excipients? Write its significance and properties of colorant, sweeteners, binders with suitable examples.
6	Differentiate between Ayurvedic and Homeopathic system of medicines.	Differentiate between Ayurvedic and Homeopathic system of medicines.
7	WHO and ICH guidelines for	WHO and ICH guidelines for evaluation

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	evaluation of drugs	of drugs
8	Write a detail note on pest and pest control in medicinal plant.	Write a detail note on pest and pest control in medicinal plant.
9	Patenting aspects and traditional knowledge of natural products.	Patenting aspects and traditional knowledge of natural products.
10	Biopesticides and Bioinsecticides	Biopesticides and Bioinsecticides
11	Source and description of fixed oil and protective agent	Source and description of fixed oil and protective agent
12	Herbal drug industry (Present scope and future prospects)	Herbal drug industry (Present scope and future prospects)
13	Write case study of curcuma	Write case study of curcuma
14	Write case study of neem	Write case study of neem
15	What is biopiracy	What is biopiracy

BP604T Biopharmaceutics and Pharmacokinetics – Theory

Tutorial number	Tutorial Questions	
	A Division (VKC)	B Division (RST)
1	Draw a typical plasma concentration time profile curve	Draw a typical plasma concentration time profile curve
2	Enlist factors affecting drug absorption	Enlist factors affecting drug absorption
3	Draw a figure of mechanism of drug transport	Draw a figure of mechanism of drug transport
4	Explain Dissolution theories in details	Explain Dissolution theories in details



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5	Draw a table on BCS classification of drugs	Draw a table on BCS classification of drugs
6	Define volume of administration and how do you determine V_d ?	Define volume of administration and how do you determine V_d ?
7	Enlist the renal and non-renal excretion	Enlist the renal and non-renal excretion
8	Draw a diagram of Phase-I and Phase-II reaction of drug metabolism	Draw a diagram of Phase-I and Phase-II reaction of drug metabolism
9	Draw the Structure of Cell membrane	Draw the Structure of Cell membrane
10	What do you understand by pharmacokinetic model ?	What do you understand about the pharmacokinetic model ?
11	How do you estimate K_m and V_{max}	How do you estimate K_m and V_{max}
12	Define bioavailability. Mention the objectives of bioavailability studies.	Define bioequivalence and types of equivalence.
13	Define bioequivalence and types of equivalence.	Define C_{max} and T_{max}
14	Define C_{max} and T_{max}	What is the difference between linear and non-linear PK?

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15	What is the difference between linear and non-linear PK?	Explain IVIVC
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BP605T Pharmaceutical Biotechnology–Theory

Tutorial number	Tutorial Questions	
	A Division (VSB)	B Division (VSB)
1	Structure of class I and II MHC molecules.	Structure of class I and II MHC molecules.
2	Flowchart of cellular immunity.	Flowchart of cellular immunity.
3	General method of preparation of bacterial vaccine.	General method of preparation of bacterial vaccine.
4	Flow chart of hybridoma technology.	Flow chart of hybridoma technology.
5	ELISA diagram- Direct method	ELISA diagram- Direct method
6	ELISA diagram- Indirect method	ELISA diagram- Indirect method
7	Flowchart of Western Blot.	Flowchart of Western Blot.




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8	Flowchart of Northern Blot.	Flowchart of Northern Blot.
9	Flowchart of rDNA technology.	Flowchart of rDNA technology.
10	Flowchart of Insulin production.	Flowchart of Insulin production.
11	Flowchart of Interferon production.	Flowchart of Interferon production.
12	Flowchart of HB vaccine.	Flowchart of HB vaccine.
13	Flowchart of PCR.	Flowchart of PCR.
14	Flowchart of Penicillin production.	Flowchart of Penicillin production.
15	Diagram of bacterial transduction mechanism.	Diagram of bacterial transduction mechanism.

BP606T Quality Assurance– Theory

Tutorial number	Tutorial Questions	
	A Division (RST)	B Division(NRS)
1	Define Quality Assurance and QC. Write Difference between QA & QC	1. Write properties of packaging material 2. What is container and classify it

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2	Define TQM and Explain in brief.	1. enlist the QC test for glass container 2.write in short QC test for paper and board
3	What is Qbd, write a note on elements of Qbd.	write a short note on GLP
4	Define ISO and discuss in brief about ISO certification.	1.Enlist ICH guideline for stability testing 2.write a difference between QA and QC
5	Explain in brief accreditation of NABL certification.	1.Enlist the elements of QbD 2.What is ICH and enlist its objectives
6	Define Organization with brief introduction.	What is ISO 9000 and ISO 4000
7	Explain in detail about the premises of the pharmaceutical industry.	What is organization and personnel
8	Define validation. Enlist its types and explain analytical validation.	1.What is sanitation premises 2.Define premises and write in short

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		about maintenance of premises
9	Define complaint, with its classification. Write note on Good Complaint Handling Procedure.	1 What is calibration and enlist steps involved in calibration of pH meter
10	Define GLP & write down in details about facilities involved in it.	1. What is qualifications 2. what is performance qualifications 3. what is installation qualifications
11	What is Inventory control, write down details method involved in it.	Write process of pH calibration
12	Define audits. Explain the Audits system in detail.	Prepare 10 mcqs of unit 5
13	IPQC for packaging materials.	Write about the master formula record
14	MCQ- Documentation	Write in detail about batch formula record
15	MCQ- Recalls	Prepare 5 mcqs of unit 3



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BP502T Industrial PharmacyI– Theory

Tutorial number	Tutorial Questions (VKC)
1	Give objectives of preformulation studies
2	Define polymorphism and molecular Adduct
3	Differentiate between crystalline and amorphous drug
4	Enlist analytical methods for characterization of solid drug
5	Define hygroscopy and its methods
6	Define PKa and Partition coefficient
7	Enlist the ideal properties of tablet excipients
8	Enlist various types and methods for preparation of tablet
9	Why tablets are still considered to be a formulation of choice among oral Preparations?



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10	Enlists the IPQC tests for tablets.
11	Enlist unofficial test for tablet
12	Give classification of tablet
13	Define tablet with suitable examples
14	Define Cmax and Tmax
15	What is the difference between linear and non-linear PK?

BP503T Pharmacology II – Theory

Tutorial number	Tutorial Questions (SKP)
1	<ol style="list-style-type: none">1. Explain oral hypoglycemic agents in detail.2. Write a note on histamine, leukotrienes
2	<ol style="list-style-type: none">1. Enlist the classification of NSAID and explain Pharmacology of salicylate.2. Write about Vit D.
3	<ol style="list-style-type: none">1. Enlist the classification of antiplatelet agent and explain MOA, adverse effects and therapeutic uses of Aspirin, abciximab and clopidogrel.

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	2. Write a short notes on calcitonin hormone
4	1. Enlist the classification of diuretic and explain pharmacology of thiazide diuretics and carbonyl anhydrase inhibitors with suitable examples. 2. Write about parathyroid hormone
5	1. Define autocooids and write about angiotensin and bradykinin 2. Explain antidiuretics in detail.
6	1. Enlist the classification of shock and describe its treatment in detail. 2. Write a note on coagulants.
7	1. Enlist the classification of antigout drugs and explain MOA, adverse effects and therapeutic uses of allopurinol and probencid. 2. Describe thyroid hormone synthesis in detail.
8	1. Classify antihyperlipidemic agents in detail. 2. Give comments on digitalis toxicity.
9	1. Enlist the classification of antianginal drugs and explain pharmacological action of nitrate with suitable examples. 2. What is the significance of b-blockers used in angina?
10	1. Enlist the classification of antihypertensive agents and explain MOA of ACE inhibitors and b-blockers. 2. Write a note on AT1 receptor antagonist and direct renin inhibitor.
11	1. Describe MOA of antiarrhythmic agents.



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	2. Write a note on plasma volume expander.
12	1. Explain MOA, adverse effects and therapeutic uses of hormone synthesis inhibitors and iodine trapping inhibitors. 2. Describe MOA, adverse effects of streptokinase.
13	1. Explain pharmacological action of digoxin in detail. 2. Describe potassium channel opener in detail
14	1. Describe MOA of calcium channel blocker and vasodialtors. 2. Explain vasodilators in treatment of CHF.
15	1. Write a note on glucocorticoid. 2. Write in brief about ACE inhibitors in CHF.

BP504T Pharmacognosy II – Theory

Tutorial number	Tutorial Questions (CJB)
1	Write B.S., CC and uses of cinchona bark Write identification test of cinchona bark Write morphological identification of different varieties of cinchona bark
2	Write B.S cinnamon bark Write morphological identification of cinnamon bark Write the microscopical diagnostic characteristics of cinnamon bark.

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3	<p>Write B.S., CC and uses of seena leaf</p> <p>Write morphological identification of senna leaf</p> <p>Describe lamina of senna leaf</p> <p>Name the drug which contain sclerenchymatous sheath</p> <p>Write the microscopical diagnostic characteristics of senna leaves</p>
4	<p>Write B.S., CC and uses of clove bud</p> <p>Which type of oil glands present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p> <p>Write important morphological characteristics of clove bud.</p>
5	<p>Write B.S., CC and uses of ephedra stem</p> <p>Which type of vascular bundle present in clove bud?</p> <p>Write the microscopical diagnostic characteristics of ephedra stem</p> <p>Write important morphological characteristics of ephedra stem</p>
6	<p>Write B.S., CC and uses of fennel fruit</p> <p>How many vittate and vascular bundle present in mericarp of fennel fruit?</p> <p>Write the microscopical diagnostic characteristics of fennel fruit</p> <p>Write important morphological characteristics of fennel fruit</p>
7	<p>Write B.S., CC and uses of coriander fruit</p> <p>How many primary and secondary ridges present in mericarp of coriander</p>



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	fruit? Explain primary and secondary ridges (morphological characteristics) of coriander fruit?
8	Explain method of isolation of caffeine Draw the structure of caffeine Explain the role of solvent used in extraction of caffeine
9	Explain method of isolation of atropine Draw the structure of atropine Explain the role of solvent used in extraction of atropine
10	Explain method of isolation of diosgenin Draw the structure of diosgenin Explain the role of solvent used in extraction of diosgenin
11	Explain method of isolation of sennoside Draw the structure of sennoside Explain the role of solvent used in extraction of sennoside
12	Explain theory and principle of TLC
13	Explain principle TLC eucalyptus oil (Stationary and mobile phase, Spray reagent, Rf value of constituents)



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	Explain method of isolation of eucalyptus oil. Write Biological sources of eucalyptus oil
14	Write BS CC and uses of asafoetida, benzoin, colophony, myrrh, aloes Write identification test of asafoetida, benzoin, colophony, myrrh, aloes
15	Give the principle of separation of sugars by paper chromatography Define Rf value

BP505T- Pharmaceutical Jurisprudence –Theory

Tutorial number	Tutorial Questions (SNJ)
1	Give the objective of Pharmacy Act
2	Prepare the pharmacy act related case Study based on true incidence
3	Give the objective of D& C Act and
4	Prepare the D & C related case Study based on true incidence
5	Write in detail. Schedule M
6	Write in detail. Schedule N and P
7	Discuss in details. Sale of Drug
8	Discuss in brief DTAB committee
9	Write objective Narcotic and psychotropic substance
10	Prepare the Narcotic and psychotropic substance related case Study based on

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	true incidence
11	Give the objective animal curely act
12	Write in detail RTI Act
13	Write objective medicinal toilet preparation act
14	Prepare the medicinal toilet preparation act related case Study based on true incidence
15	Write in detail DPCO act

BP602T Pharmacology III – Theory

Tutorial number	Tutorial Questions (SKP)
1	<ol style="list-style-type: none">1. Classify immunosuppressants with examples.2. State clinical uses of immunosuppressants.3. Enlist adverse effects of immunosuppressants and describe pharmacology of immunosuppressants.
2	<ol style="list-style-type: none">1. Describe pharmacology of immunostimulants.2. Discuss the molecular basis of chemotherapy and write about cotrimoxazole?3. Explain pharmacology of sulphonamides.
3	<ol style="list-style-type: none">1. Write note on beta lactum antibiotics.2. Describe pharmacology of penicillins.3. Describe pharmacology of cephalosporins.
4	<ol style="list-style-type: none">1. Comment on penicillinase resistant penicillins.2. Comment on antibiotic resistance.

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	3. Discuss pharmacology of tetracyclines.
5	1. Explain pharmacology of chloramphenicol. 2. State adverse effects and clinical uses of tetracycline. 3. Discuss pharmacology of gentamycin.
6	1. State MOA of aminoglycoside antibiotics. 2. Write a note on macrolide antibiotics. 3. Comment on polyenes and polypeptide antibiotics.
7	1. Discuss the pharmacology of quinolones. 2. Write notes on fluroquinolones. 3. Describe chemotherapy of tuberculosis.
8	1. Describe chemotherapy of leprosy. 2. State MOA of amphotericin B? 3. Explain pharmacology of nystatin.
9	1. Write a note on antifungal antibiotics. 2. Describe the pharmacology of antiviral drugs. 3. Classify antimalarial drugs and state MOA of chloroquine.
10	1. Describe pharmacotherapy of malaria. 2. Describe pharmacotherapy of amoebiasis. 3. Define and classify anthelmintic drugs.
11	1. Describe the pharmacotherapy of cancer. 2. Discuss the life cycle of malaria parasites. 3. Define and enlist types of toxicity studies.
12	1. Explain general principles of toxicology 2. Explain acute and chronic toxicity 3. Discuss about mercury poisoning.
13	1. Explain rhythm and cycles

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	2. Write notes on biological clock and their significance leading to chronotherapy. 3. Discuss management of barbiturates poisoning.
14	1. Explain drug acting on UTI. 2. Discuss teratogenicity 3. Write about general principles of treatment of poisoning.
15	1. Classify antiamebic agents and explain pharmacology of any one category. 2. Classify anthelmintics agents and explain pharmacology of any one category. 3. Discuss treatment of constipation.

BP603T Herbal Drug Technology –Theory

Tutorial number	Tutorial Questions (CJB)
1	Write in detail about Good agriculture practices in cultivation of medicinal plants.
2	Write the various sources of herbs. Discuss selection, identification and authentication of herbal materials.
3	What is nutraceuticals? Classify them. Write health benefit and role of nutraceuticals in ailments of various disease.
4	Define herb-drug and herb-food interaction. Write its classification and possible side effects and interaction of hypericum and garlic.
5	What are herbal excipients? Write its significance and properties of colorant, sweeteners, binders with suitable examples.
6	Differentiate between Ayurvedic and Homeopathic system of medicines.
7	WHO and ICH guidelines for evaluation of drugs
8	Write a detail note on pest and pest control in medicinal plant.
9	Patenting aspects and traditional knowledge of natural products.

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10	Biopesticides and Bioinsecticides
11	Source and description of fixed oil and protective agent
12	Herbal drug industry (Present scope and future prospects)
13	Write case study of curcuma
14	Write case study of neem
15	What is biopiracy

BP604T Biopharmaceutics and Pharmacokinetics – Theory

Tutorial number	Tutorial Questions (VKC)
1	Draw a typical plasma concentration time profile curve
2	Enlist factors affecting drug absorption
3	Draw a figure of mechanism of drug transport
4	Explain Dissolution theories in details
5	Draw a table on BCS classification of drugs
6	Define volume of administration and how do you determine Vd ?
7	Enlist the renal and non-renal excretion




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8	Draw a diagram of Phase-I and Phase-II reaction of drug metabolism
9	Draw the Structure of Cell membrane
10	What do you understand by pharmacokinetic model ?
11	How do you estimate K_m and V_{max}
12	Define bioavailability. Mention the objectives of bioavailability studies.
13	Define bioequivalence and types of equivalence.
14	Define C_{max} and T_{max}
15	What is the difference between linear and non-linear PK?

BP605T Pharmaceutical Biotechnology–Theory

Tutorial number	Tutorial Questions
1	Structure of class I and II MHC molecules.
2	Flowchart of cellular immunity.

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3	General method of preparation of bacterial vaccine.
4	Flow chart of hybridoma technology.
5	ELISA diagram- Direct method
6	ELISA diagram- Indirect method
7	Flowchart of Western Blot.
8	Flowchart of Northern Blot.
9	Flowchart of rDNA technology.
10	Flowchart of Insulin production.
11	Flowchart of Interferon production.
12	Flowchart of HB vaccine.
13	Flowchart of PCR.
14	Flowchart of Penicillin production.
15	Diagram of bacterial transduction mechanism.

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Tutorial - 1

Q.1 Clasify the drug transport mechanism.

→ The three categories of drug transport mechanism involved in absorption are.

A] Trans cellular / Intra cellular transport.

B] Paracellular / Intercellular transport.

C] Vesicular transport.

A] Intracellular / Transcellular transport.

1] Is defined as the passage of drugs across the GI epithelium, It is the most common pathway for drug transport.

2) The various transcellular transport processes involved in drug absorption are -

i) passive transport processes → This transport process do not require energy, it further or divides to -
a) passive diffusion.

- b) Pore transport
- c) Ion-pair transport
- d) Facilitated mediated diffusion.

iii] Active transport processes

This transport processes require energy from ATP to move drug molecules from extracellular to intracellular.

• They are of two types -

- a) Primary active transport.
- b) Secondary active transport.
- c) Symport (Co-transport)
- d) Antiport (counter-transport)

B] Paracellular / Intercellular Transport

It is defined as the transport of drugs through the junction between the GI epithelial cells. This pathway is of minor importance in drug absorption.

C] Vesicular or Corpuscular transport (Endocytosis)

• Like active transport, there are also energy dependent process but involve transport of substance within vesicles into the cell. Since the mechanism involves transport across the cell membrane. It can be into 2 categories →

- i) Pinocytosis.
- ii) Phagocytosis.

Q.2 why are both rapidity and completeness of drug absorption important? What is their significance in drug

→ Absorption is a primary focus in drug development and medicinal chemistry, since the drug must be absorbed before any medicinal effects can take place. Moreover, the drug's pharmacokinetic profile can be easily and significantly changed



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by adjusting factors that affect absorption.

Solubility and permeability are considered as the major physicochemical factor that affect that rate and extent of oral drug absorption, moreover other physicochemical properties always show their effects to drug absorption via affecting solubility and permeability.

Tutorial - 2

Q.1 It is always advisable to administer vitamin B in small multiple doses rather than at as a single dose why?

→ Because, Bioavailability of a drug containing B vitamin decreases with increasing doses. Hence they are always advisable to administer B vitamin in small multiple doses rather than as a single dose.

Q.2 Discuss the similarities and differences between passive and facilitated diffusion.

→ A] Similarities

1) Both are come under the trans-cellular / Intracellular transport.

2) Both are come under the passive transport process.



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Tutorial No: 01

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Q.1 what is preformulation, give the physico-chemical properties of drug?

ANS Laboratory studies to determine the characteristics of Active substance And excipients. OR

It is study doing before the formulation.

physico-chemical property of drug

- | | |
|-----------------------|----------------|
| Physical properties | Physical Forms |
| Organoleptic property | - solid |
| - Colour | - Liquid |
| - odour | - Gases |
| - Taste | |

internal structure / Crystalline Forms
Amorphous Forms

Crystalline Forms	Amorphous Forms
- In crystalline solid, atoms and molecule are arranged in definite lattice forms	- In Amorphous solid, atoms and molecules are not in Lattice forms
- Fixed internal structure	- not fixed internal
- sharp M point & B point	- change mp & B.p
- more stable ↑	- Less stable ↑




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e.g The crystalline forms of penicillin-G potassium is more stable and more therapeutic response than amorphous forms @ particle size, shape and surface area these properties also affects bio-pharmaceutical behaviour of drugs.

particle size - A term which is used to measure the dimension of particle particle size affects solubility, dissolution, bio-availability

e.g = particle size ↓ → Solubility ↑

particle shape

overall shape of particle

- texture of particle
- overall dimension of particles

e.g = O circle shape, □, square shape

Flow property

- hygroscopicity
- Angle of repose
- Density
- Carr's, Hausner's ratio

Flow property ↑, Production ↑, mixing ↑

Flow property determine by Angle of repose, Carr's index, Hausner's ratio, etc

Hygroscopicity

Ability of particle to absorb moisture

Density

- Density of powder
density = $\frac{\text{mass}}{\text{volume}}$

Bulk Density	True Density
- mass of powder divided by bulk volume	- mass of powder divide by volume exclude pores/voids
B.D = $\frac{\text{mass}}{\text{Bulk volume}}$	T.D = $\frac{\text{mass}}{\text{True volume}}$

Angle of Repose

The Angle betⁿ the surface of pile and its horizontal surface

$$\tan \alpha = \frac{h}{r}$$

where h = height of pile
r = radius of pile

Angle of repose ↓ = Flow property ↑

Carr's index

$$\text{Carr's index} = \frac{T.D - B.D}{T.D} \times 100$$

Hausner's ratio

$$\text{Hausner's ratio} = \frac{\text{Tapped Density}}{\text{Bulk Density}}$$

Solubility profile

Solubility ↑ Absorption ↑

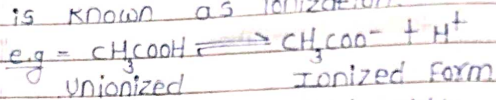
It define as Amount of solute dissolve in the solvent



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a) Ionization constant (PKa)

The conversion of ionized form to unionized is known as ionization.



unionized forms \rightarrow Lipid soluble

For Acidic drug

$$\text{pH} = \text{pK}_a + \log \frac{\text{Ionised}}{\text{unionised}}$$

For Basic drug

$$\text{pH} = \text{pK}_a + \log \frac{\text{Unionised}}{\text{Ionised}}$$

b) pH

Power of hydrogen (or) potential of hydrogen

- used that check are Acidic/Basic.

- It also affects the solubility of particles.

- By changing the pH, the solubility of the acidic or basic drug can be changed

e.g. solubility of Aspirin can be enhanced

by addition of alkaline buffer

c) Dissolution

It is the process by which solid substance enter the solvent phase to make solⁿ

d) Partition coefficient

ratio of unionized drug in oil phase to water phase

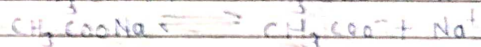
$$K_{o/w} = \frac{X_o}{X_w}$$

X_o = Conc. of drug in org. phase (oil)

X_w = Conc. of drug in Aq. phase

\downarrow Decrease solubility of particle

e.g. = when solⁿ of Acetic Acid sodium acetate is added it suppress the dissociation of Acetic Acid



polymorphism

- Enantiotropic - polymorph can be changed ^{reversibly}

- Monotropic - irreversible

Chemical property

@ hydrolysis

when drug substance comes under moisture/water then it reacts with water

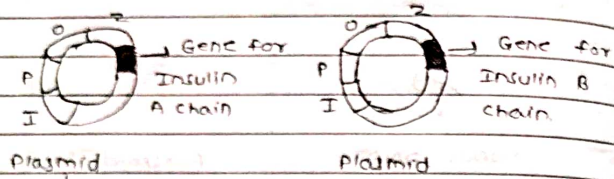
and get hydrolysed (breakdown of drug

substance) - degradation

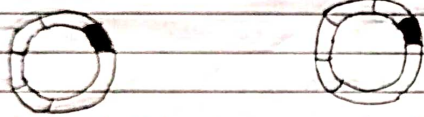
- mostly drug with ester, amide, cyclic Amide

undergoes hydrolysis

Q. flow chart of Insulin production



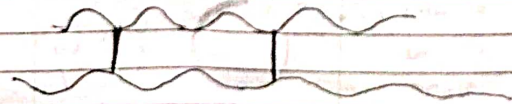
Transform into E. coli



Culture cells in a nutrient medium containing lactose. Isolate & Purify A & B chain

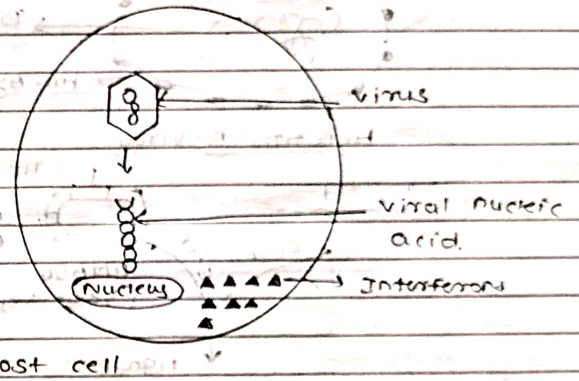


Joining of chain is reconstitution

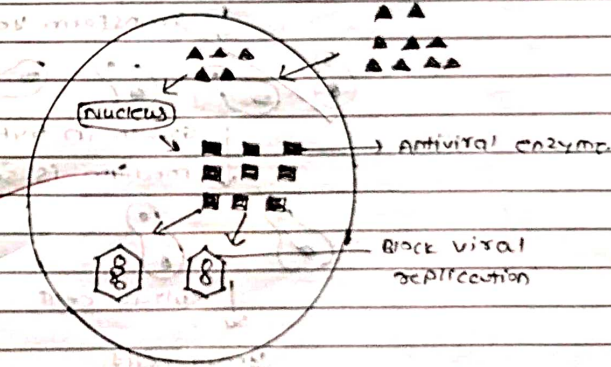


Human Insulin

Q. flow chart of interferon production



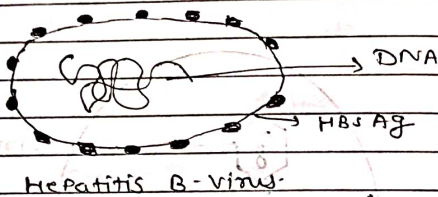
Host cell



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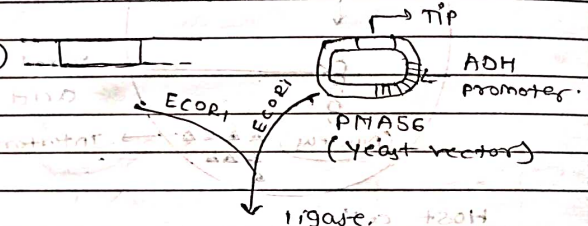
Q4) Flow chart of HB vaccine.

(A)



Hepatitis B-virus

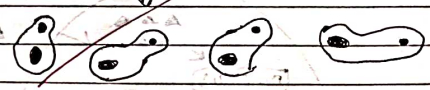
(B)



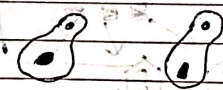
Ligate

HBs Ag gene

Transform yeast cell



Growth in tryptophan type medium is select cell

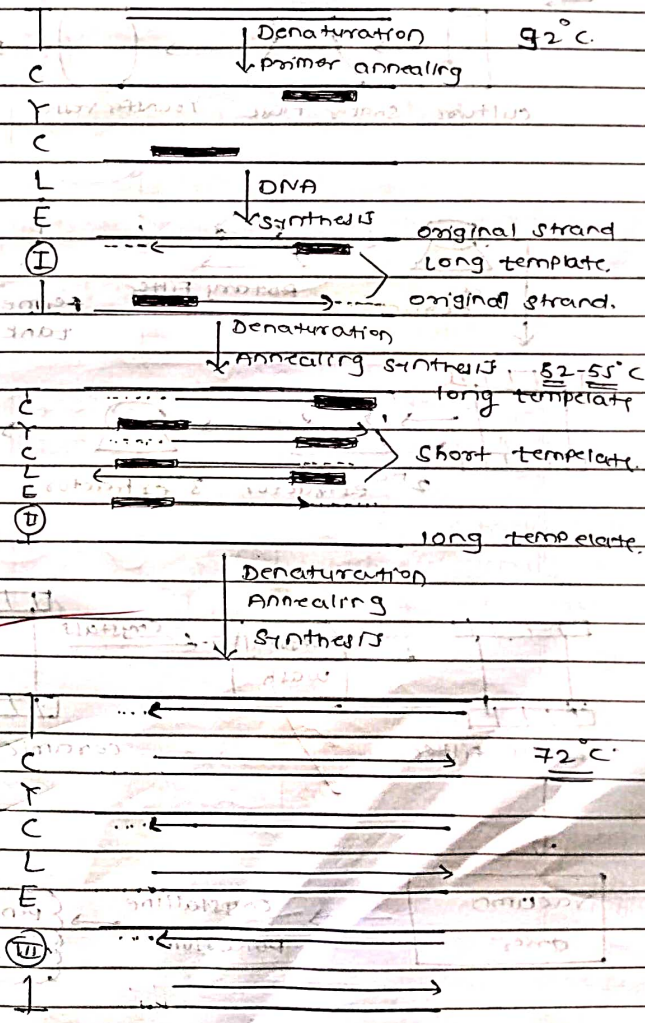


Culture cells

Yeast cells

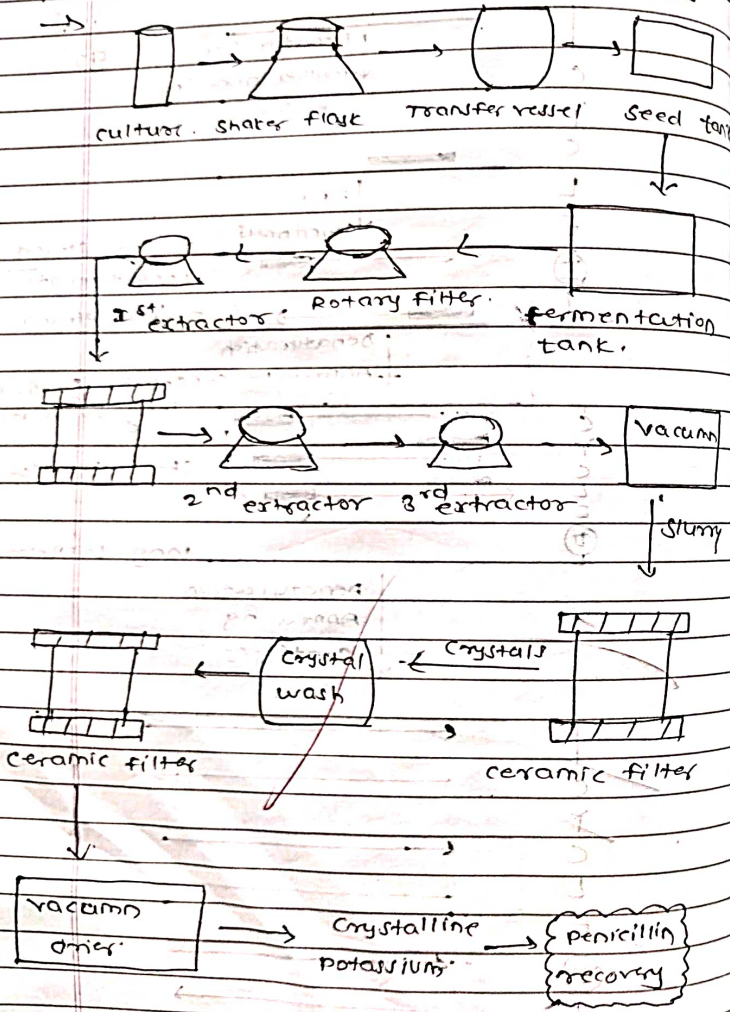
Purify HBs Ag (as 22nm particles)

Q. Flow chart of PCR

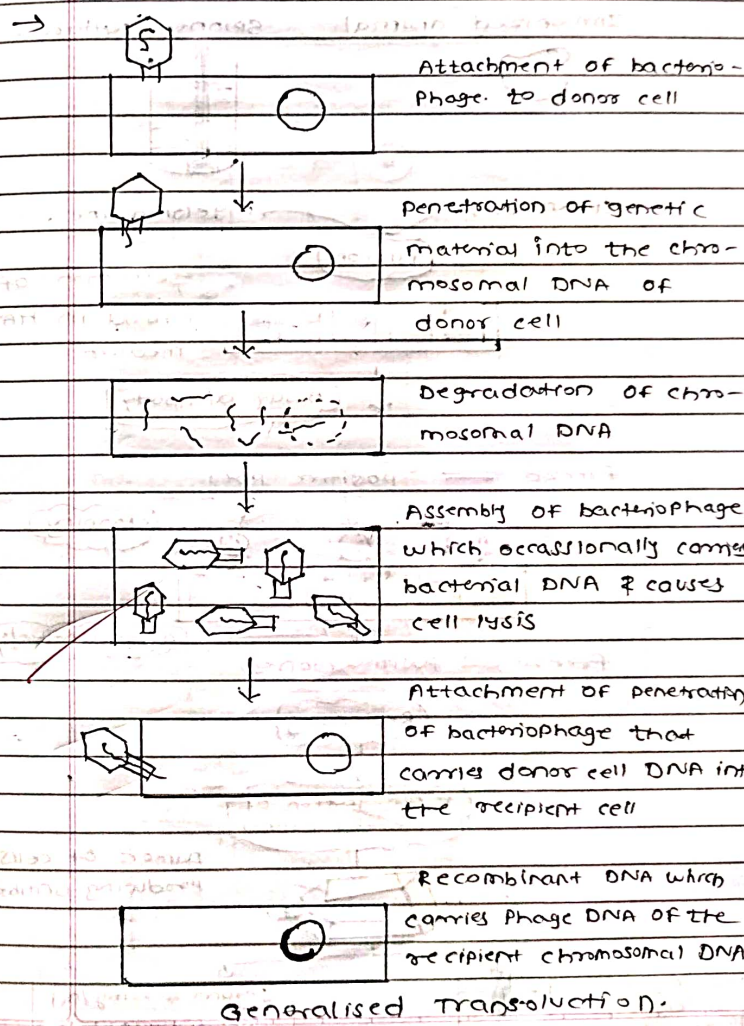


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Q. Flow chart of penicillin production



Q.1) Diagram of bacterial transduction mechanism.



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Q. Flow chart of hybridoma technology.

Immunized animal → Splenocytes culture.



Spleen cell + myeloma line.

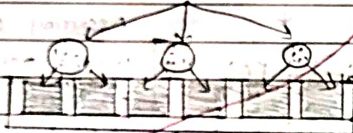
fusion

selection of hybrid in HAT medium.



Assay antibody

freeze ⇒ positive 'pots'



cloning

freeze ⇒ positive clones

Assay antibody

recording

Preparation of selected clones



Tumors of cells producing antibody

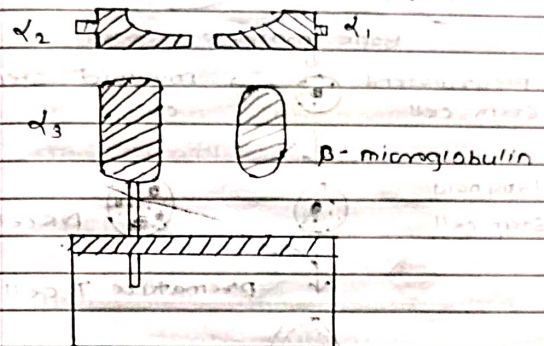


100ug/ml specific antibody

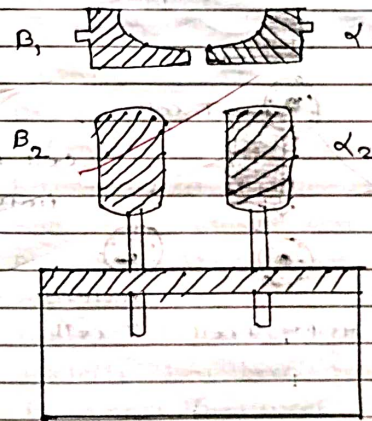
Serum 5-20mg/ml specific antibody

Q. Structure of class I & II MHC molecule.

A) structure of class I MHC molecule.



B) structure of class II MHC molecule.



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Ans 1) Objective of D and C Act, 1940.

- 1) The Drugs and Cosmetics Act 1940 provides the central legislation which regulates import manufacture distribution and sale of drug and Cosmetics.
- 2) The main objective of the act is to ensure that the drug is available to the people are safe and efficacious.
- 3) The D & C Act regulates manufacturing and import of the drug into India so that no substandard or spurious drug is imported or Manufacture.
- 4) This provides the regulation of sale & distribution of drug & cosmetic whereby only qualified individual can undertake.
- 5) This Act also provide constitution of two boards, DTAB and Ayurvedic and Unani Drugs Technical Advisory Board.

6) It also provides the establishment of two DCC one for allopathic and other for Ayurvedic, Siddha, Unani drugs.

• Import of Drugs and Cosmetics.

a) Prohibition of import of certain drug and cosmetic.

i) Any drug or cosmetic which is not standard quality.

ii) Drug not labelled in prescribed manner.

iii) Misbranded or Spurious or Adulterated.

b) Import of Drugs under licence.

i) Drug specified in schedule C & D.

ii) Drug specified in schedule X.

iii) Any New Drug.



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c) Import of New drug.

i) written permission required of the licensing authority.

ii) fee shall be paid through challan.

d) Import of Drugs for examination.

i) Drug is imported under a license in form 41.

ii) Drug must be exclusively accounted by the license authority.

iii) authorized inspector must be allowed to investigate.

• Manufacture of Drugs.

i) Any drug or cosmetic which is not of standard quality.

ii) whose formulae with quality not disclose.

iii) The license shall carry the manufacture and examination of drugs at the place specified in the license.

iv) All vaccines shall be New drug unless certified otherwise by the Licensing Authority.

Ans 2)

The main objective of Pharmacy act, 1948.

i) To provide uniform education and training to those persons willing to enter the Pharmacy profession.

ii) To maintain control over the persons of the pharmacy profession by regulating them as registered Pharmacists in every state and union territories.



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State Pharmacy Council	Joint state Pharmacy Council
<ul style="list-style-type: none"> Elected members 	<ul style="list-style-type: none"> Elected members
Six members elected amongst themselves by Registered Pharmacists of the state.	Six members elected amongst themselves by registered Pharmacists of each participating state.
one member elected by the medical council of the state from amongst its members.	one member elected by the medical council of the state from amongst its members.
<ul style="list-style-type: none"> Nominated members 	<ul style="list-style-type: none"> Nominated members
Five members nominated by the state government of whom at least three should possess degree or diploma.	two to four members nominated by each participating state government next degree or diploma.

<ul style="list-style-type: none"> Exc-office members 	<ul style="list-style-type: none"> Exc-office members
Chief administrative medical officer of state.	Chief administrative officer of each state.
Officer in charge of Drug Control Adm.	Officer in charge of Drug Control Adm.

Ans 3) Education and Regulation of pharmacy are as follows.

- i) minimum education qualification required for admission.
 - ii) Duration of course of study and training.
 - iii) Nature and period of practical training.
 - iv) Syllabus of examination & the standard to be attained.
 - v) minimum facilities required to be provided by an institution.
- Any institute or organization providing a course study & examination in pharmacy will be allowed to take practice for PCI approval.




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- i) Applicant of letter.
- ii) Inspector.
- iii) Approval.
- iv) Declaration.

- No one approved any qualification, in pharmacy granted by an authority outside India.
- The person is required to maintain a central register of pharmacist which contains persons' details.
- The central register is put in Gazette form once to the.

Ans: 4)

The offences and penalties of the Pharmacy act are as follows:

- 1) falsely claiming to be registered pharmacist.
- If a person is a registered pharmacist in another state and at the time of making such claim

has filled an application for registration in the state, he shall not be deemed to guilty of the offence.

- 2) Dispensing by unregistered persons.
- Dispensing by unregistered persons is punishable with imprisonment of up to six months or a fine up to 1000 RS or both.

- 3) Failing to surrender Certificate of registered.
- It is punishable with fine up to 50 RS. Cognizance of offence shall not be taken by any authority.

- 4) Penalty for obstructing Inspector.
- Any person willfully obstructs in exercise of State Pharmacy act, shall be liable to imprisonment up to 6 months & 1000 RS FINE.

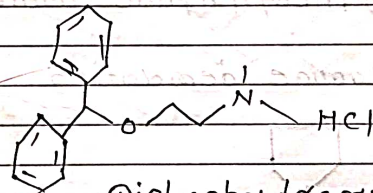
[Tutorials]

- a) Explain the chemistry of histamine and its physiological roles.
- b) Explain classification of H₁ antagonist
- c) Explain SAR of H₁ antagonists.

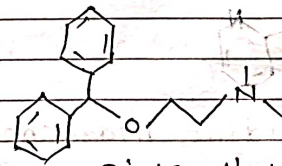
B) Explain classification of H₁ antagonist

→ 1st generation

i) Amino alkyl ethers



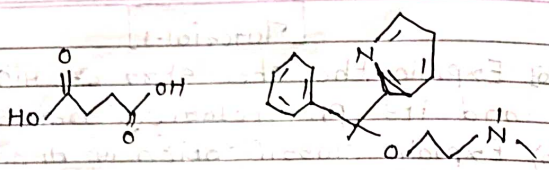
Diphenhydramine Hydrochloride



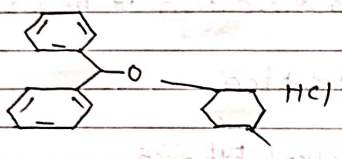
Dimenhydrinate



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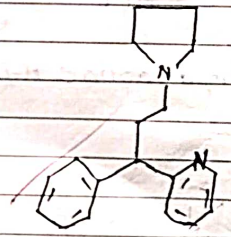


Doxylamine Succinate

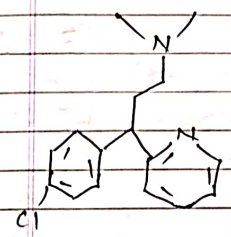


Diphenylphyline Hydrochloride

2) Propylamine derivatives

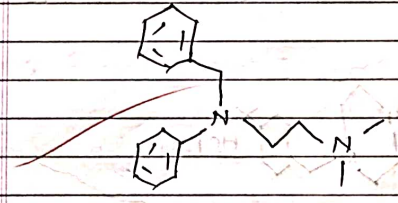


Pipradlidine Hydrochloride



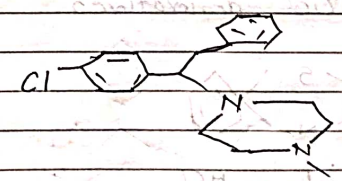
Chlorpheniramine Maleate

3) Ethylenediamine derivatives



Pipelazine Hydrochloride

4) Piperazine derivatives

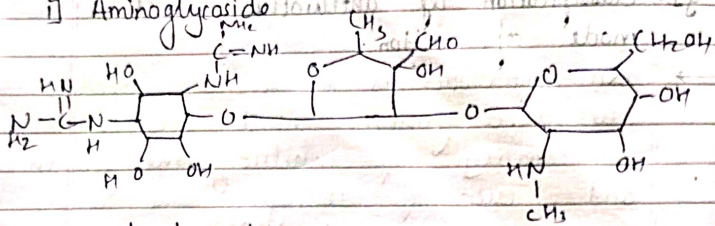


Chlorcyclizine Hydrochloride



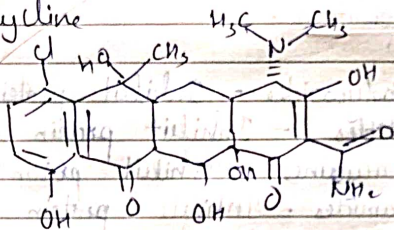
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1] Aminoglycoside



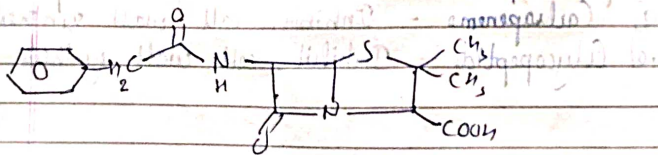
streptomycin

2] tetracycline



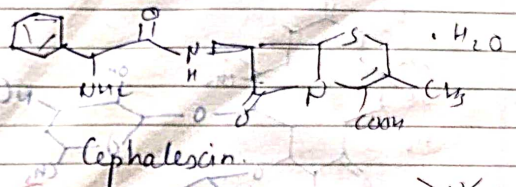
chlortetracycline

3] Penicillin



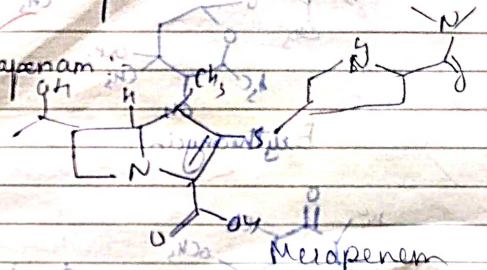
Pen G

4] Cephalosporin



Cephalexin

5] Carbapenem

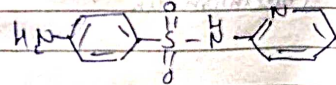


Meropenem

6] Sulfonamides



Sulphanamide

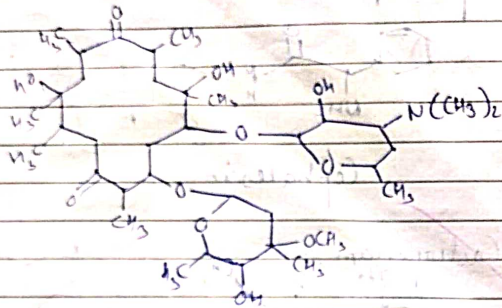


Sulphapyridin

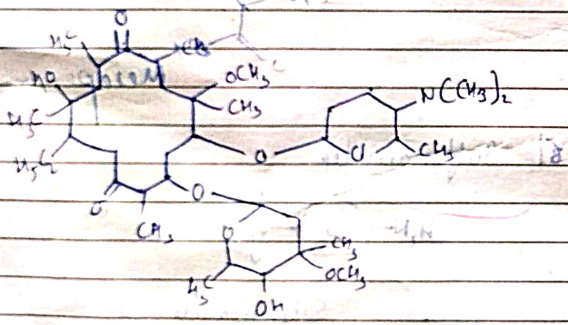


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9] Macrolides:-



Erythromycin



Clarithromycin

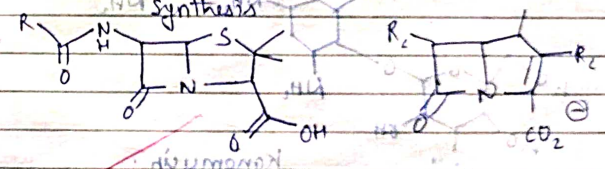
Tutorial-2

Q2. Classify Antibiotics on the basis of chemical structure.

→ On the basis of chemical structure:-

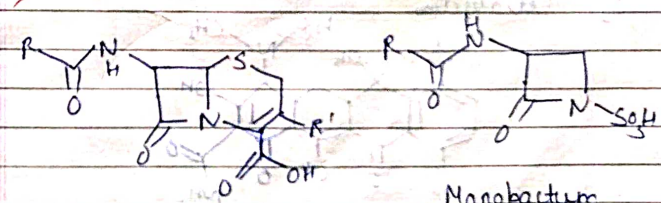
- 1] β -lactam
- 2] Aminoglycoside
- 3] Tetracycline
- 4] Macrolide
- 5] Miscellaneous

ii] β -lactam Antibiotics: Inhibit cell wall synthesis



Penicillin

Carboxipenem

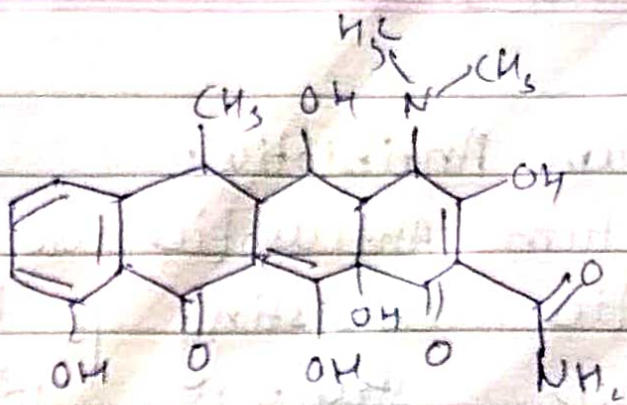


Cephalosporin

Monobactam

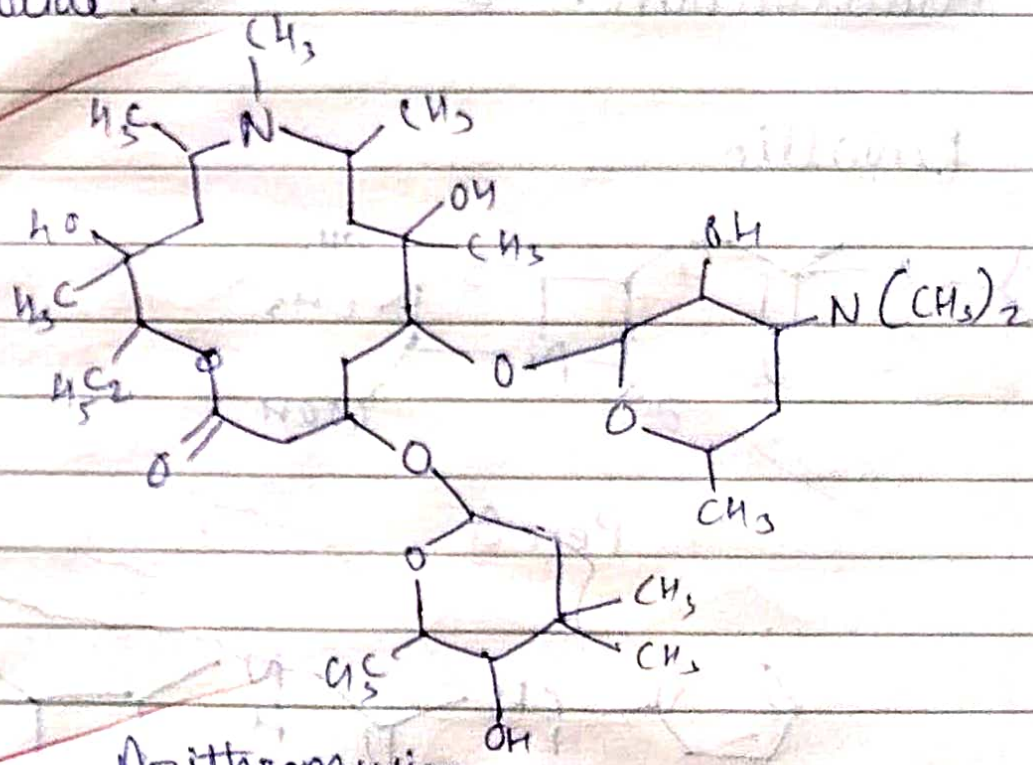


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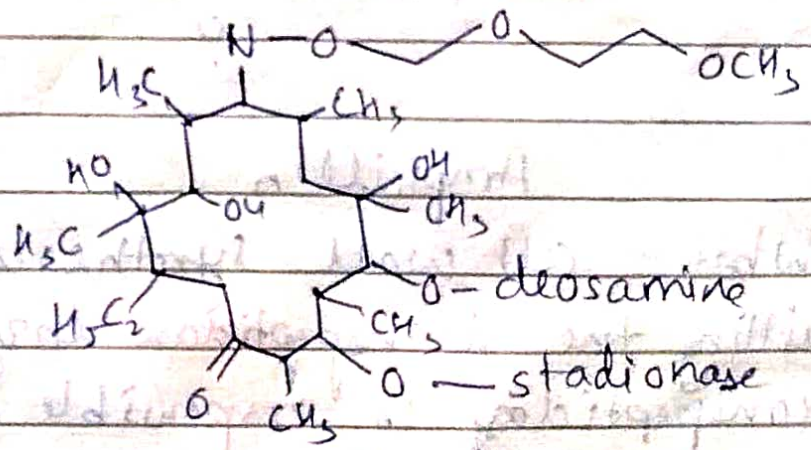


Doxycycline

4] Macrolide :-



Azithromycin

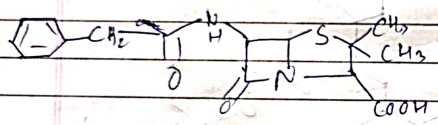


Roxithromycin

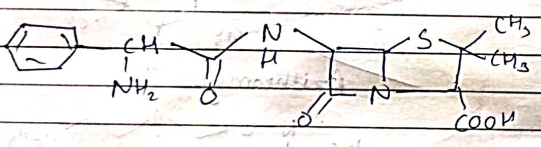
Tutorial-3

Qs. Classify β -lactam Antibiotics.
 β -lactam Antibiotics are class of antibiotics consisting β -lactam ring in their structure with different substitution. It includes Penicillin, Cephalosporin, Carbapenem, Monolactam.

1] Penicillin



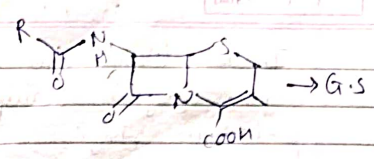
Pen G



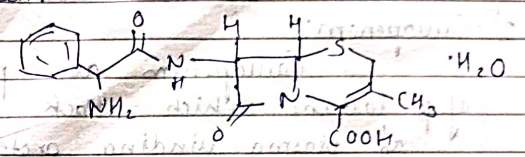
Ampicillin

MOA It inhibit cell wall synthesis by inhibiting the transpeptidase enzyme. As this transpeptidase is responsible for NAG & NAM formation which further forms cell wall

2] Cephalosporin

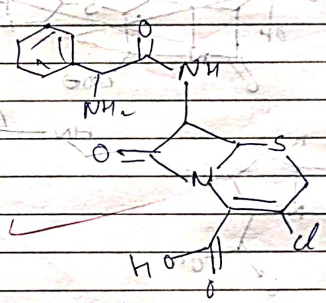


1] 1st Gen:-



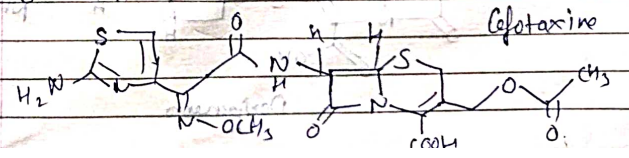
Cephalexin.

2] 2nd Gen:-



Cephadrone

3] 3rd Gen



Cefotaxime



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List of Tutorials (Final Year B. Pharmacy)

Academic Year 2022-23

BP702T Industrial Pharmacy-II – Theory

Tutorial number	B Division
1	What is six sigma concept?
2	What are the responsibilities of Drug Development Team? Gives its compositions
3	Explain in details six sigma methodologies.
4	What is mean by Out of specification?
5	Describe an overview of Regulatory Affairs? Give its roles and responsibilities
6	Give its different phases of investigations
7	What are Indian drug regulatory requirements?
8	Elaborate the organization and function of CDSCO.
9	What is pilot plant scale-up techniques?
10	What are SUPAC guideline? Discuss in brief.
11	Add a note on Quality risk management.
12	What are different quality management systems?
13	Discuss regulatory requirements and approval procedures for New Drug
14	Explain in detail different quality management systems



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BP703T Pharmacy Practice – Theory

Tutorial number	Tutorial Questions	
	A Division	B Division
1	1) Define Hospital and explain its classification. 2) Write about functions of hospital.	1) Define Hospital and explain its classification. 2) Write about functions of hospital.
2	1) Define Hospital Pharmacy and explain its structure and organization. 2) Write about functions of Hospital Pharmacist.	1) Define Hospital Pharmacy and explain its structure and organization. 2) Write about functions of Hospital Pharmacist.
3	1) Define ADR and explain its type. 2) Describe monitoring and reporting of ADR.	1) Define ADR and explain its type. 2) Describe monitoring and reporting of ADR.
4	1) Define community pharmacy and describe about its design/structure and organization . 2) Write about legal records.(maintenance)	1) Define community pharmacy and describe about its design/structure and organization . 2) Write about legal records.(maintenance)
5	1) Describe types of drug distribution systems. 2) Explain dispensing of drug to ambulatory patients.	1) Describe types of drug distribution systems. 2) Explain dispensing of drug to ambulatory patients.
6	1) Write about dispensing of controlled drug.	1) Write about dispensing of controlled drug.



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	2) Define Hospital Formulary and explain its content.	2) Define Hospital Formulary and explain its content.
7	1) Differentiate between Hospital formulary and drug list. 2) Write about limitations of Therapeutic drug monitoring.	1) Differentiate between Hospital formulary and drug list. 2) Write about limitations of Therapeutic drug monitoring.
8	1) Explain types of TDM(therapeutic drug monitoring) 2) Define medication adherence and explain its causes.	1) Explain types of TDM(therapeutic drug monitoring) 2) Define medication adherence and explain its causes.
9	1) Write role of Pharmacist in medication adherence. 2) What is the need for a patient medications history interview?	1) Write role of Pharmacist in medication adherence. 2) What is the need for a patient medications history interview.
10	1) Write about infrastructure requirements in community pharmacy management. 2) Give the functions of the pharmacy and therapeutic committee.	1) Write about infrastructure requirements in community pharmacy management. 2) Give the functions of the pharmacy and therapeutic committee.
11	1) Write about infrastructure requirements in community pharmacy management. 2) Give the functions of the pharmacy and therapeutic committee.	1) Write about infrastructure requirements in community pharmacy management. 2) Give the functions of the pharmacy and therapeutic committee.
12	1) Write about inpatient and outpatient prescription. 2) Give the Sources of drug information.	1) Write about inpatient and outpatient prescription. 2) Give the Sources of drug information.



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13	1) Describe steps involved in patient counseling. 2) Write the role of pharmacist in patient counseling.	1) Describe steps involved in patient counseling. 2) Write the role of pharmacist in patient counseling.
14	1) Role of pharmacist in the education and training program. 2) Write about rational use of common over the counter medications.	1) Role of pharmacist in the education and training program. 2) Write about rational use of common over the counter medications.
15	1) Write role of hospital pharmacist, advisory committee. 2) Write about budget preparation and implementation.	1) Write role of hospital pharmacist, advisory committee. 2) Write about budget preparation and implementation.

BP704T Novel Drug Delivery System – Theory

Tutorial number	B Division
1	1. Write advantages of NDSS 2. Define modify release tablet and controlled release dosage form . Enlist limitation of conventional dosage form
2	Write in short physiochemical properties of drugs which is ideal for CDDS
3	1. What is dissolution control release mechanism 2. Define polymer ad write application of polymer in CDDS
4	What is microencapsulation and write in short about air suspension method

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5	<ol style="list-style-type: none">1. Write in short about formulation aspects of buccal DDS2. Prepare 5 mcqs on Mucosal DDS
6	<ol style="list-style-type: none">1. What is implantable DDS and Draw a diagram of osmotic pump2. Write advantages of implantable DDS
7	<ol style="list-style-type: none">1. What is targeted DDS and write its advantages2. Draw a diagram of liposomes
8	<ol style="list-style-type: none">1. Write any one method of nanoparticles2. Draw a diagram of niosomes
9	<ol style="list-style-type: none">1. What is monoclonal antibodies2. Write advantages and disadvantages of gastroretentive DD
10	Prepare 5 mcqs on Unit floating DDS
11	<ol style="list-style-type: none">1. Draw diagram of implantable DDS2. Write applications of GRDDS
12	<ol style="list-style-type: none">1. Define TDDS and write its applications2. Enlist the factors influencing rate of penetration
13	Prepare 5 mcqs on Unit transdermal DDS
14	<ol style="list-style-type: none">1. What is nasopulmonary DDS and write its applications2. Write advantages onasopumony DDS
15	<ol style="list-style-type: none">1. What is dry powder inhalers2. What is nebulizers



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BP802T Social and Preventive Pharmacy

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Give the objective and Functions of the following a. National Health Programme for AIDS b. National Mental Health Programme	Write a note on social and health education
2	Define Health Education and Give function aim and objectives	Give the objective and Functions of the following a)Pulse Polio Programme b) National health programme on TB
3	How Malaria is caused? Discuss in detail the clinical manifestation prevention and control of Malaria .	What is health and classify health and Hygiene in details
4	Explain in detail about Universal Immunisation programme	Give short note on Chikun Guinea
5	Write down the Role of WHO in India	Explain in detail about Universal Immunisation programme
6	Define Urbanisation	Define Urbanisation
7	Give aim and objective of National Programme for mother and child	Give aim and objective of National Programme for mother and child
8	Give brief discussion about EBOLA virus	What are the Importance of personal Hygiene in details
9	Describe the functioning of NPHCE	Define Health Education
10	Define National Urban health Mission	Write the functions of WHO

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11	Define PHC centres	Define PHC centres
12	Define Health Education	Define Community Health services and explain their Classification, History in details
13	Write down the principles of community health services	Describe the NPHCE
14	What are the Importance of personal Hygiene in details	Enumerate the National Model for the Malaria control Programme in India
15	Give the objective and Functions of the following c. National Health Programme for AIDS d. National Mental Health Programme	Define Acute respiratory Infections

BP806ET Quality Control and Standardization of Herbals

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Basic tests for drugs – Pharmaceutical substances, Medicinal plants materials and dosage forms	1) Write the test procedure for senna leaf 2) Enlist physical method of evaluation of crude drug with example. 3) Enlist test procedures for pharmaceutical substances. 4) Enlist test procedures for pharmaceutical dosage forms. 5) Enlist test procedures for medicinal plant material.
2	WHO guidelines for quality control of herbal drugs.	Write the physical evaluation and microscopical evaluation of crude drug.
3	Evaluation of commercial crude drugs intended for use	MCQ 1) Ketamine hydrochloride is the crystalline powder... a) Brown b) White

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		<p>c) Cream d) None</p> <p>2) Magnesium sulphate is crystal. a) Pale brown b) Light green c) Cream d) Colourless</p> <p>3) Vinblastin sulphate is crystalline powder which is... a) Hygroscopic b) White to slightly yellow c) Toxic d) All of above</p> <p>4) Ruthenium red test is used for to detect ... a) Tannins b) Resins c) Gum & Mucilage d) Fixed oil & Fats</p> <p>5) Leaf length of alexander senna is a) 20-40 mm b) 25-50 mm c) 5-15 mm d) 7-20 mm</p>
4	Quality assurance in herbal drug industry of cGMP, GAP, GMP and GLP in traditional system of medicine.	Write the test procedure for ketamine hydrochloride
5	WHO Guidelines on current good manufacturing Practices (cGMP) for Herbal Medicines	Write WHO guidelines on CGMP
6	WHO Guidelines on GACP for Medicinal Plants.	Write objective of CGMP, GLP, GACP.
7	EU and ICH guidelines for quality control of herbal drugs.	Explain EU guidelines for quality control of herbal drug.
8	Research Guidelines for Evaluating the Safety and Efficacy of Herbal Medicines	Difference between CGMP and GMP
9	Stability testing of herbal medicines. Application of various chromatographic techniques in standardization of herbal products.	<p>MCQ</p> <p>1) Specific test application to oral liquid and powders... a) Uniformity of mass b) pH c) Microbial limit d) All of the above</p> <p>2) TTC stands for.... a) Threshold of Toxicological Concern b) Threshold of Toxicity Concern c) Threshold of Toxic Concern d) None of above</p> <p>3) FMA stands for.... a) European Medicine Agency b) European Medicine</p>

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		Authority c) European Medicine Activity d) European Mecation Agency 4) Medicinal plant should not be grown in soil contain with... a) Heavy metal b) Residue c) Chemical d) All of above 5) Collected & cultivated medicinal plant material should carry different... a) Batch No. b) Bracket No. c) Alphabetic Code d) Container Code
10	Preparation of documents for new drug application and export registration	Write the guidelines for quality control of herbal drug.
11	GMP requirements and Drugs & Cosmetics Act provisions	1) Write application of HPLC 2) Applications of Gas Chromatography
12	Regulatory requirements for herbal medicines.	1) Applications of liquid chromatography & Hyper mass spectroscopy? 2) Applications of Hyper Nuclear Magnetic Resonance?
13	WHO guidelines on safety monitoring of herbal medicines in pharmacovigilance systems	What is super critical fluid chromatography & Give its applications?
14	Comparison of various Herbal Pharmacopoeias.	Note on common technical documents (CTD)
15	Role of chemical and biological markers in standardization of herbal products	Draw the figure of the drug approval process in India?

Pharmaceutical Regulatory Science (BP804 ET)

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Define drug discovery. Explain stages	Flow chart of stages of drug discovery

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	of the drug discovery process.	process.
2	Brief emphasis on IND & NDA	What is pre-clinical trials.
3	Write a note on Hatch waxman act. Note on ANDA.	Explain different stages of clinical trials.
4	Explain different stages of clinical trials.	Flow chart of NDA review process.
5	Write in details about CDSCO.	Flow chart of ANDA review process.
6	Write in details about TGA.	Summary of CDSCO.
7	Summary of USFDA.	Summary of TGA.
8	Note on Orange book.	Summary of USFDA.
9	Duties of Principle investigator.	Summary of MHLW.
10	Note on drug master file (DMF).	Note on Orange book.
11	Outline of Clinical trial protocol.	Note on drug master file (DMF).
12	Flow chart of procedure for export of pharmaceutical products.	Duties of Principle investigator.

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13	Note on Pharmacovigilance.	Note on Pharmacovigilance.
14	MCQ- Drug discovery, Regulatory compliance.	Outline of Clinical trial protocol.
15	MCQ- GLP, CFR, CTD.	Flow chart of procedure for export of pharmaceutical products.

List of Tutorials (Final Year B. Pharmacy)

Academic Year 2021-22

BP703T Pharmacy Practice – Theory

Tutorial number	Tutorial Questions	
	A Division	B Division
1	1) Define Hospital and explain its classification. 2) Write about functions of hospital.	1) Define Hospital and explain its classification. 2) Write about functions of hospital.
2	1) Define Hospital Pharmacy and explain its structure and organization. 2) Write about functions of Hospital Pharmacist.	1) Define Hospital Pharmacy and explain its structure and organization. 2) Write about functions of Hospital Pharmacist.
3	1) Define ADR and explain its type. 2) Describe monitoring and reporting of ADR.	1) Define ADR and explain its type. 2) Describe monitoring and reporting of ADR.
4	1) Define community pharmacy and describe about its design/structure and	1) Define community pharmacy and describe about its design/structure and

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	organization . 2) Write about legal records.(maintenance)	organization . 2) Write about legal records.(maintenance)
5	1) Describe types of drug distribution systems. 2) Explain dispensing of drug to ambulatory patients.	1) Describe types of drug distribution systems. 2) Explain dispensing of drug to ambulatory patients.
6	1) Write about dispensing of controlled drug. 2) Define Hospital Formulary and explain its content.	1) Write about dispensing of controlled drug. 2) Define Hospital Formulary and explain its content.
7	1) Differentiate between Hospital formulary and drug list. 2) Write about limitations of Therapeutic drug monitoring.	1) Differentiate between Hospital formulary and drug list. 2) Write about limitations of Therapeutic drug monitoring.
8	1) Explain types of TDM(therapeutic drug monitoring) 2) Define medication adherence and explain its causes.	1) Explain types of TDM(therapeutic drug monitoring) 2) Define medication adherence and explain its causes.
9	1) Write role of Pharmacist in medication adherence. 2) What is the need for a patient medications history interview?	1) Write role of Pharmacist in medication adherence. 2) What is the need for a patient medications history interview.
10	1) Write about infrastructure requirements in community pharmacy management. 2) Give the functions of the pharmacy and therapeutic committee.	1) Write about infrastructure requirements in community pharmacy management. 2) Give the functions of the pharmacy and therapeutic committee.

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11	1) Write about infrastructure requirements in community pharmacy management. 2) Give the functions of the pharmacy and therapeutic committee.	1) Write about infrastructure requirements in community pharmacy management. 2) Give the functions of the pharmacy and therapeutic committee.
12	1) Write about inpatient and outpatient prescription. 2) Give the Sources of drug information.	1) Write about inpatient and outpatient prescription. 2) Give the Sources of drug information.
13	1) Describe steps involved in patient counseling. 2) Write the role of pharmacist in patient counseling.	1) Describe steps involved in patient counseling. 2) Write the role of pharmacist in patient counseling.
14	1) Role of pharmacist in the education and training program. 2) Write about rational use of common over the counter medications.	1) Role of pharmacist in the education and training program. 2) Write about rational use of common over the counter medications.
15	1) Write role of hospital pharmacist, advisory committee. 2) Write about budget preparation and implementation.	1) Write role of hospital pharmacist, advisory committee. 2) Write about budget preparation and implementation.

BP802T Social and Preventive Pharmacy 2022-2023

Tutorial number	Tutorial Questions	
	A Division	B Division
1	Which of the following are included in new philosophy of health. a) Health is worldwide social	Which of the following are included in new philosophy of health. a) Health is worldwide social

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	<p>goal</p> <p>b) Health and its maintenance is major social investment</p> <p>c) Health is fundamental human right</p> <p>d) all of the above.</p> <p>The is the heart of the patient counselling session</p> <p>a) Preparing for the session. b) Opening the session. c) Counselling content. d) Closing the session.</p> <p>The following are the principles of inventory control except-</p> <p>a) Demand Forecasting b) Accuracy c) Warehouse flow d) Overstocking</p>	<p>goal</p> <p>b) Health and its maintenance is major social investment</p> <p>c) Health is fundamental human right</p> <p>d) all of the above.</p> <p>The is the heart of the patient counselling session</p> <p>a) Preparing for the session. b) Opening the session. c) Counselling content. d) Closing the session.</p> <p>The following are the principles of inventory control except-</p> <p>a) Demand Forecasting b) Accuracy c) Warehouse flow d) Overstocking</p>
2	<p>1. Which are preventive measures for cancer</p> <p>2. Write about causative agent of chicken guinea.</p> <p>3. Write about prevention and control of dengue.</p> <p>4. 4. Describe pathogenesis of diabetes mellitus.</p>	<p>1. Which are preventive measures for cancer</p> <p>2. Write about causative agent of chicken guinea.</p> <p>3. Write about prevention and control of dengue.</p> <p>4. 4. Describe pathogenesis of diabetes mellitus.</p>
3	<p>1. Write about malnutrition and its prevention.</p> <p>2. Discuss about poverty and health.</p>	<p>1. Write about malnutrition and its prevention.</p> <p>2. Discuss about poverty and health.</p>



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	3. Describe about prevention and control of hypertension.	3. Describe about prevention and control of hypertension.
4	<ol style="list-style-type: none"> 1. Preventive measures pneumonia 2. National T.B. control programme 3. Preventive medicine for acute respiratory infections 	<ol style="list-style-type: none"> 1. Preventive measures pneumonia 2. National T.B. control programme 3. Preventive medicine for acute respiratory infections
5	<ol style="list-style-type: none"> 1. National programme for prevention and control of deafness 2. Universal immunization programme 3. National programme for control of blindness 	<p>National programme for prevention and control of deafness</p> <p>Universal immunization programme</p> <p>National programme for control of blindness</p>
6	<ol style="list-style-type: none"> 1. National family welfare programme 2. National tobacco control programme 3. National Malaria Prevention Program 	<ol style="list-style-type: none"> 1. National family welfare programme 2. National tobacco control programme 3. National Malaria Prevention Program
7	<ol style="list-style-type: none"> 1. Vitamin deficiencies 2. Impact of urbanization on health and disease 3. Prevention and control of cholera 	<ol style="list-style-type: none"> 1. Vitamin deficiencies 2. Impact of urbanization on health and disease 3. Prevention and control of cholera
8	<ol style="list-style-type: none"> 1. Integrated disease surveillance program 2. National leprosy control programme 	<ol style="list-style-type: none"> 1. Integrated disease surveillance program 2. National leprosy control programme 3. Prevention and control

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	3. Prevention and control of lymphatic filariasis	of lymphatic filariasis
9	1.Prevention and control of SARS 2.Prevention and control of Ebola virus 3.National programme for the health care for the elderly	Prevention and control of SARS Prevention and control of Ebola virus National programme for the health care for the elderly
10	1. Social health programme; role of WHO in Indian national program 2. Pulse polio programme 3. National health intervention programme for mother and child	1. Social health programme; role of WHO in Indian national program 2. Pulse polio programme 3. National health intervention programme for mother and child
11	Prevention and treatment of influenza National mental health program Prevention and treatment of dengue	1. Prevention and treatment of influenza 2. National mental health program 3. Prevention and treatment of dengue
12	1. National leprosy control programme. 2. National mental health program. 3. Prevention and treatment of T.B.	1. National leprosy control programme. 2. National mental health program. 3. Prevention and treatment of T.B.
13	1. Universal immunization	1. Universal immunization programme.

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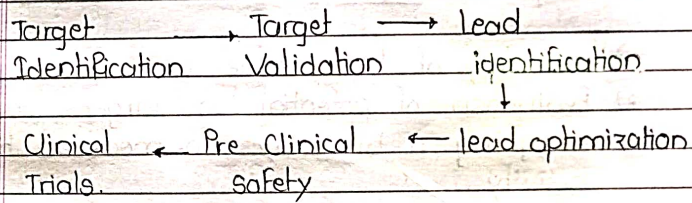
	<p>programme.</p> <p>2. National programme for control of blindness.</p> <p>3. Pulse polio programme</p>	<p>2. National programme for control of blindness.</p> <p>3. Pulse polio programme</p>
14	<p>1. National family welfare programme.</p> <p>2. National tobacco control programme.</p> <p>3. National Malaria Prevention Program</p>	<p>1. National family welfare programme.</p> <p>2. National tobacco control programme.</p> <p>3. National Malaria Prevention Program</p>
15	<p>1. Role of WHO in Indian national program</p> <p>2. Give details of Health promotion and education in school.</p> <p>3. Write about functions of PHC</p>	<p>1. Role of WHO in Indian national program</p> <p>2. Give details of Health promotion and education in school.</p> <p>3. Write about functions of PHC</p>

* Tutorial - 1 *

1) Explain in Detail about stages of Drug discovery.

→ Drug Discovery effort address a biological target that has been shown to play a role in development of disease. It involve synthesis, characterization, screening, assay for therapeutic activity.

Stages-



2) Target identification -

- 1) The drug target can be biomolecule as protein that could exist in isolated or complex form.
- 2) The biomolecule have special site for location that match with other drug



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3) The structure of drug may change over the duration of pathological condition.

• limitation

1) The drug is disease dependent means that every target is involved in special disease

2) Drug aimed to target not equally effective in treatment of disease

b) Target Validation

1) Discovery of biomolecule of interest

2) Evaluation of potential as target

3) Designing a bioassay to measure biological activity

4) Evaluation of hits

c) Lead Discovery

1) As disease related molecular target identified and validated in disease model, compound that interact with animal or cell based model are identified

2) This is done with knock out or knock in animal model.

3) Leads can also be obtained by molecular aided 3D computer graphics that allow the design or structure based on new molecule

4) If any compound show positive response, traditional laboratory methods are used to manufacture than at large scale

d) Lead Optimization

1) Lead Optimization process that beings with a compound that display a potential biological with action and confirm with identification of best compound

2) It contribute to turning a biologically active chemical to an effective and safe drug discovery process



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e) Pre-Clinical development-

Preclinical includes developing a method of large scale synthesis, animal safety studies carcinogenicity test, drug delivery, elimination, metabolism.

f) Clinical Trials-

- 1) Treatment trial. Experimental treatment
- 2) Prevention trial
- 3) Diagnostic trial
- 4) Screening trial
- 5) Quality of life trial.

Q Explain in detail stages involve in Drug development process.

→ ① Preclinical Stage:

- 1) It comprises of stage studies on animal to find out various parameter for a potential drug.

- 2) Genitotoxicity screening as well as a investigation of drug absorption and metabolism, toxicity of candidate drug.
- 3) Toxicity studies ranging from two to three month.

② Clinical Stage:

- 1) Phase 0 - This is an exploratory phase of Clinical that expedite development of promising drug by establishing drug.
- 2) Phase 1 - Are carried out in small number of healthy volunteer, usually 20 to 100 with disease or condition the study several month.
- 3) Phase III - Are expanded, controlled, uncontrolled trials. They are performed preliminary evidance of effectiveness of potential drug at phase II.

3) Phase II - This phase include early controlled clinical trials conducted to obtain some preliminary data on effectiveness of potential drug for particular identification in patient with.

4) Phase IV - known as post marketing surveillance (PMS) and carried out once the candidate drug is approved as a market as medicinal product.

3] What is Innovator and Generic Product.

→ Innovator product -

- 1) It is most appropriate term for newly developed drug product
- 2) The innovation process may start with promising compound, but out of 10,000 compound tested, usually one compound is finally approved as drug regulatory authority.

3) An innovator drug is first drug product created that contain its specific drug to receive approval for use.

4) It is usually the product for which efficacy, safety, quality have fully establish.

* Generic Product -

1) On September 24, 1984 Act, The Drug Price competition and patent term restoration act was passed known as Hatch - Waxman act.

2) The requirement for this was to submit an ANDA by pharmaceutical company.

3) Generic formulation developed and manufactured by other companies when patent and other exclusively right of innovator expired.

* Tutorial 2 *

PATENT

DATE 19 / 1 / 23

1) Write about Note on Hatch-Waxmann Amendment.

→ 1) Also known as "The drug price competition" and patent term restoration act

2) Enacted in 1984

3) Hatch-waxman Amendments, establish the approval pathway for generic drug product, under which applicants can submit an abbreviated new drug application (ANDA) under section 505 (j) of the Federal Food, Drug and Cosmetic Act (FD & C Act)

4) Amended the patent law

5) Amended Federal Food, Drug and Cosmetic Act

6) Before 1962 - new drug approved based on safety alone.

7) Before 1962, Proof of efficiency made compulsory for making approval of new drug.

* Objective of Act -

- 1) Reducing Cost associated with approval of generic drug.
- 2) Allowing early-experimental use
- 3) Motivating generic drug manufacturer.

* Provision of Act -

- 1) Creation of Section 505 (j)
- 2) Section 505(j) established ANDA approval process

* Approval of Genetics -

1) An applicant files an ANDA with the Food and drug administration and seek to demonstrate therapeutic equivalence to specified, previously

approval "reference listed drug"

2) When an ANDA approved, FDA publishes patent information and drug approved drug product list.

2) Advance Technology involve in drug discovery

→ Technology has been a major driver of advances in drug discovery.

2) Automation, nanofluid, imaging software and assay technologies have played a major role in getting data faster

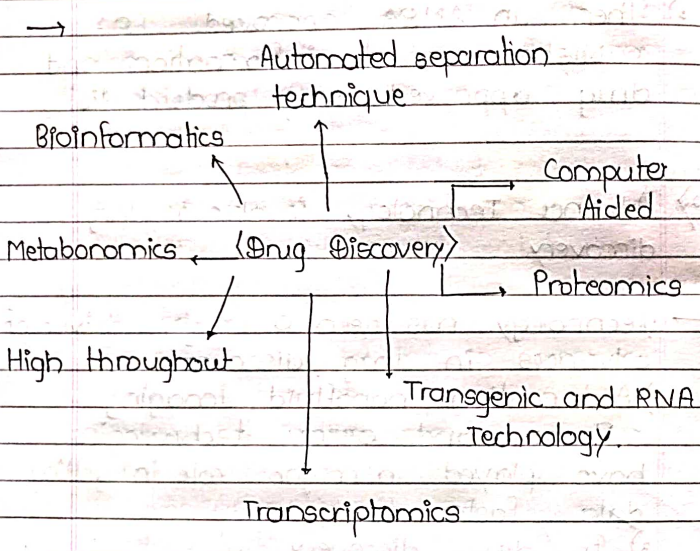
3) In drug discovery at such advanced state that further improvement are no longer period needed or cost effective

4) There were signs of recovery after economic downturn of early 2000



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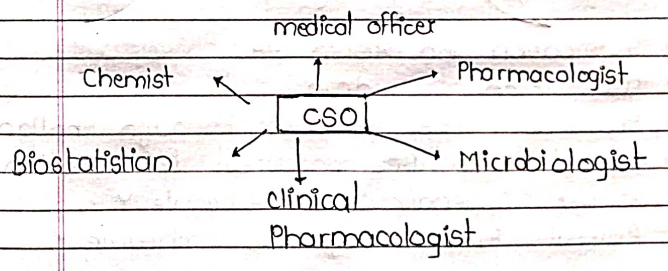
• Advance Technology involve in drug discovery.



Tutorial- 3

1] Define IND, Explain their types and category.

- 1) The main purpose of an IND is to provide the data showing that it is reasonable to being test of new on human.
- 2) IND is the result of successful preclinical development programme.
- 3) It is also vehicle through which a sponsor advances to next stage of drug development known as clinical trial.
- 4) IND Not an application for marketing approval but to seek permission to conduct Clinical trial



Tutorial - 1

Q.1) Explain in detail about stages of drug discovery.

→ Drug discovery stages effort address a biological target that has been shown to play a role in development of diseases. It involves synthesis, characterization, screening, assay for therapeutic efficacy.

i) Target identification :-

- The drug target can be biomolecule as protein that could exist in isolated or complex form.
- The biomolecule have special site or location that match with other drug
- The structure of drug may change over the duration of pathological condition.

ii) Target Validation :-

- Discovery of biomolecule of interest
- Evaluation of potential as target
- Designing a bioassay to measure biological activity.
- Evaluation of hits

iii) lead discovery :-

- As disease related molecular target identified and validated in disease model, compound that interact with animal or cell based model are identified.

- This is done with knock-out or knock-in animal model.

- leads can also be obtained by molecular aided 3D computer graphic that cover the design or structure based on new molecule.

iv) lead optimization :-

- lead optimization process that begin with compound that display a potential biological action and confirm with identification of best compound.

- It contribute to turning a biologically active chemical to an effective and safe drug discover process.

v) Pre-clinical development :-

- Pre clinical includes developing a method of large scale synthesis, animal safety studies, carcinogenicity test, drug discovery, process, elimination, metabolism.

vi) clinical trials :-

- ① Treatment trial
- ② Prevention trial
- ③ Diagnosis trial
- ④ Screening trial
- ⑤ Quality of life trial.

g.2) Explain in detail stages involve in drug development process.

→

① Pre-clinical stage :-

- It comprises of stage studies on animal to findout various parameter for potential drug

- Genotoxicity screening as well as investigation of drug absorption and metabolism, toxicity of candidate drug.

- Genotoxicity screening as well as investigation of drug absorption and metabolism, toxicity of candidate drug

- toxicity studies ranging from 2 week to 3 month

2) clinical stage :-

i) Phase 0 :- This is an exploratory phase of clinical that expedite develop-



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ment of promising drug by established drug.

ii) Phase I :- are carried out in small number of healthy volunteers, usually 20 to 100 with disease or condition the study several months.

iii) Phase II :- This phase include early controlled clinical trials conducted to obtain some preliminary data on potential identification in patient with disease condition.

iv) Phase III :- Are expanded, controlled uncontrolled trials. they are performed preliminary evidence of effectiveness of potential drug at phase II.

v) Phase IV :- known as post marketing surveillance and carried out once the candidate drug is approved as a market as medicinal product.

Q.3) what is innovator and generic product.

→

1) Innovator Product :-

- It is the most appropriate term for newly developed drug product.

- The innovation process may start with promising compound, but out of

10,000 compound tested, usually one compound is finally approved as drug regulatory authority

- An innovator drug is first drug product created that contain it's specific drug to receive approval for use

- It is usually the product for which efficacy, safety, quality have fully establish.

ii) Generic Product :-

- on September 24, 1984 act "the drug price competition and patent term restoration Act" was passed known as Hatch-Waxman act.

- the requirement for this was to submit an ANDA by pharmaceutical company.

- Generic formulation developed and manufactured by other companies when patent and other exclusivity right of innovator expired.

Tutorial - 2

Q.1) write a note on Hatch-Waxman amendment:

→ Also known as "the drug Price Competition and Patent Term Restoration Act".
- in acted in 1984
- Hatch-Waxman amendments establish the approval pathway for generic drug product, under which applicant can submit an abbreviated new drug application (ANDA) under section 505 of the federal food, drug and cosmetic act (F&D Act)

- Amended the Patent law
- Amended federal food, drug and cosmetic act.
- Before 1962 - new drug approved based on safety alone.
- Before 1962 - Proof of efficacy made compulsory for making approval of new drug.

objectives of Act :-

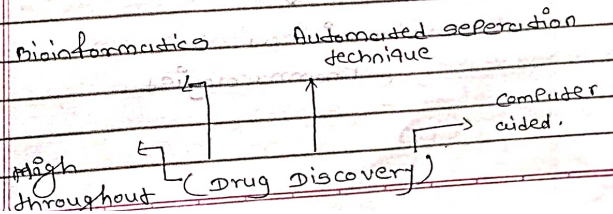
- reducing cost associated with approval of generic drug
- Allowing early experimental use
- motivating generic drug manufacturer.

• Approval of Generics :-

- An applicant files an ANDA with the food and drug administration and seek to demonstrate therapeutic equivalence to specified, previously approved, reference listed drug.
- when an ANDA approved FDA publishes Patent information and drug approved drug product list

Q.2) Advance technologies involve in drug discovery

- Technology has been a major driver of advances in drug discovery
- Automation, nonfluid, imaging software and assay technologies have played a major role in getting data faster.
- In drug discovery or such advanced state that further improvement are no longer period needed or cost-effective
- there were signs of recovery after economic downturn of early 2000's.



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- Limitations

- 1) The drug dissolve dependant means that every drug involved in special disease.
- 2) drug aimed to target not equally effective in treatment of disease.

B) Target Validation

- 1) Discovery of biomolecule of interest
- 2) Evaluation of potential of target
- 3) Discovering Biossasy to measure biological activity
- 4) Evaluation of hits

(c) Lead discovery →

- (1) As a disease related molecule target is identified the this is done with the crack-out

d) Lead optimization

Lead optimization is a process that begins with the compound that display a potential biological action and confirmed with identification of best small

e) Pre-clinical development

Pre-clinical development is a method safety study, drug discovery, elimination, metabolism

(E) Clinical trials

- ① Treatment trial
- ② Prevention trial
- ③ Diagnostic trial
- ④ Screening trial
- ⑤ Quality of life trial



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(2) Explain in detail drug development process

(1) Pre-clinical stage

- 1) It is comprised of stage drug on animal find out various parameters for further drug
- 2) Genotoxicity - screening as well as investigation of drug absorption
- 3) Toxicity study ranging from 2 week to 3 months

(2) Clinical stage

1) Phase 0

Test expedient development of promising drug by establishing drug

(2) Phase - I

these are carried out small number of

healthy volunteers, usually 20 to 100 with disease or condition the study several months

(3) Phase - II

are explained, controlled, uncontrolled trials they are generally primary evidence of effectiveness of further drug at phase - II

(4) Phase - III

from a post marketing surveillance (PMS) and the carried out by candidate drug is approved as a market - as medicinal product

Tutorial-1.

Page No.	
Date	

Q. Explain in detail about stages of Drug Discovery.

Drug:-

A drug is any substance other than food, that when, inhaled, injected, smoked, consumed, absorbed via a patch, tongue, causes a physiological change in the body.

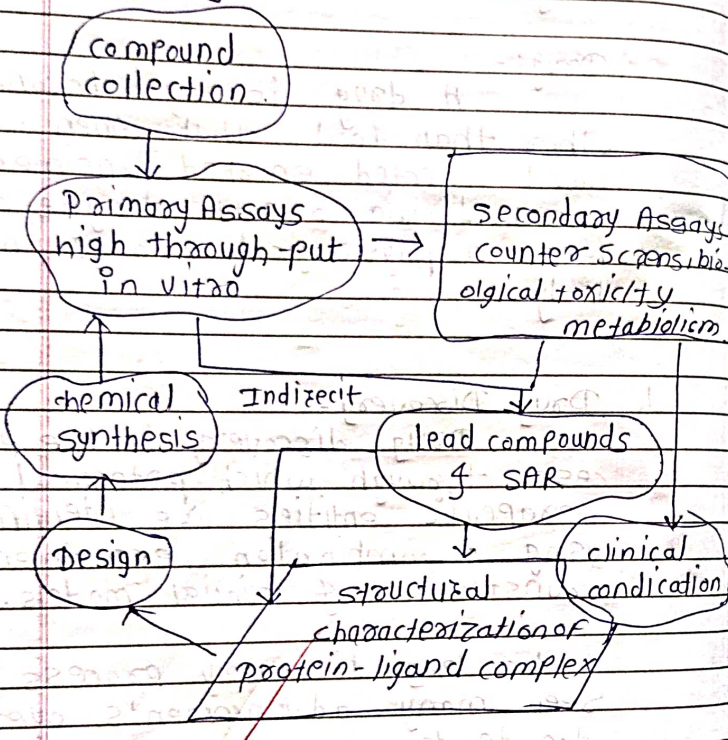
1. Drug Discovery -

Drug discovery is the process through which potential new therapeutic entities are identified using a combination of experimental transduction of clinical models.

The drug discovery process has seen many advancements over the decades.

- New technology has been a key driver of such advances with breakthrough assay technology, automation, imaging, nano-fluidics & software helping of significant

improve the process of drug discovery



New Drug Discovery process.

* Lead compounds - Are chemical compounds that show desired biological or pharmacological activity & may

indicate the development of a new clinically relevant compound. lead comp used a starting point in drug.

stages of drug discovery -

- Target identification
- Target validation
- Lead discovery
- Lead optimization
- pre-clinical development
- clinical development.

1. Target identification.

Target identification is the first key stage in the drug discovery pipeline.

- Generally speaking a drug target is the specific binding site of a drug in-vivo. through with the drug exerts its action

A specific drug target is bio-molecules normally a protein that could exist in isolated



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or complex modicity

2. The biomolecular structure might change when the biomolecules bind to small molecules be the change structure.

3. The physiological responses triggered by the changes in biomolecules structure play major role in complex regulation have the regulation effect.

2. Target Validation

new drug target validation might be of help not only to new development but the also more insight into the pathogenesis target selection. disease.

• Discovering a biomolecule of interest

3. Lead Discovery

once a disease associated molecule - target has been identified

validated in disease model's is the validated disease model's the lead generation phase which interact in fact animals or disease related cell based model's that can response of organism to a pharmacologic intervention hereby help to predict the possible profile of new drug in profile of new

4. Lead Optimization

Lead optimization is process that begins with a compound that displays an interesting biological action.

Molecules are chemically modified subsequently characterized in order to obtain compound with suitable properties to becomes a drug

Lead are characterized with respect to pharmacodynamics

properties such as efficacy & potency *in vivo* & *in vivo* properties & toxicological aspects

5. pre-clinical Development

- Develop large scale synthesis
- Animals safety
- Carcinogenicity test
- Drug delivery
- Elimination & metabolism studies
- Drug formulation experiments
- Dose-ranging studies in

6. clinical development

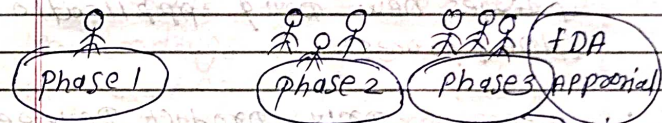
The FDA organizes clinical trials into:

- ① treatment trials - test experiments treatments or a new combination of drugs
- ② prevention trials - look for ways for prevent disease prevent it

remaining:

- ③ Diagnostic trials - find better test or procedure for diagnosing a disease
- ④ screening & trials - test method of detecting

pharmaceutical clinical trials are commonly:



test drug on healthy individuals tests on larger group of effected individuals

test for safety dosage & side effects

test on new & wider test for long term effective

comparison with other medication

treatment determined effective safe for public use



Tutorial 4

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- 4) stability testing of Herbal Medicines →
- 1) Parameter used for evaluation for herbal sample are —
- a) Microbiology testing c) Test for metal
b) dissolution test d) All the above
- d) All the above.
- 2) — is applied for the issue of permission to import or manufacture New drug.
- a) Form 42 c) Form 44
b) Form 43 d) Form 45
- c) Form 44.
- 3) Control of Laboratory should include —
- a) sampling plan c) standard
b) Test procedure. d) All of above
- d) All of above.
- 4) GMP in Drugs and Cosmetic Act 1940 and Rule 1945 come under —
- a) schedule T b) schedule M
c) schedule C d) schedule V
- b) schedule M

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- 5) Chromatography is physical method used to separate and analyse —
- a) polysaccharide c) polymer
b) Enzyme d) All of above.
- d) All of above.
- 6) When a company want to manufacture import a new drug it has to apply to undertake clinical trial belong to Schedules.
- a) schedule X b) schedule Y
c) schedule B d) schedule C
- b) schedule Y
- 7) Ayurveda system of medicine come into existence in about — Bc ago.
- a) 900 b) 500
c) 800 d) 100
- a) 900
- 8) Unani system of medicine has its root in —
- a) Greece b) China
c) India d) None
- a) Greece.

- 16) Homeopathic form of therapeutic developed by _____ physician.
- a) Indian
 - b) German
 - b) American
 - d) None
- c) German

Tutorial 5

- 5) WHO guidelines on GACP for Medicinal plant -

- 1) If no scientific published or documented cultivation data are available - method of cultivation should followed.
- a) Traditional
 - b) Modern
 - c) Biological
 - d) None of above
- a) Traditional

- 2) Climatic condition like length of days rainfall and field temp significantly influences _____ quality of medicinal plant
- a) physical
 - b) chemical
 - c) Biological
 - d) All
- d) All

- 3) _____ must not be used as fertilizer owing to potential presence of infectious micro-organisms.
- a) Synthetic fertilizer
 - b) Human Excreta
 - c) Both A & B
 - d) None
- b) Human Excreta.



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Tutorial - 10

1) Sealed glass container with an elongated neck.

- a) Gauge
- b) Ampule
- c) CSP
- d) vial

2) A high efficiency filter is

- a) HEPA filter
- b) Diluent
- c) fine filter
- d) web filter

3) A solvent that dissolve a lyophilize powder or dilutes a solⁿ

- a) Diluent
- b) solvent
- c) Additives
- d) Admixture

4) movement of particles in solⁿ through permeable membrane

- a) filter
- b) dialysis
- c) flow rate
- d) Anhydrous

5) method that maintain sterility product.

- a) aseptic technique
- b) Bleaching
- c) A clear person
- d) Admixture

6) The rate at which the solⁿ is administered to patient

- a) Gauge
- b) Coring
- c) Diluent
- d) flow rate

7) The drug molecular wt. divided by its valency a common measure of electrolyte conc.

- a) Coring
- b) valence
- c) flow rate
- d) equivalence rate.

8) chemical produced by mass that can cause fever reactⁿ in patient

- a) Bacteria
- b) virus
- c) Pyrogen
- d) mass

