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

**Academic Year 2023-24**

### **BP301T Pharmaceutical Organic Chemistry-II – Theory**

1. Explain resonance in Benzene.
2. Explain the Huckle rule.
3. Give the structure and uses of cresol and resorcinol.
4. Explain reaction of benzene.
5. Explain analytical constant of acid value, iodine value, ester value, and saponification value.
6. Give the structure and uses of naphthalene, phenanthrene, and triphenylmethane.
7. Explain bayers strain theory.
8. Explain sachse mohrs theory.
9. Draw Haworth synthesis of naphthalene.
10. Draw Haworth synthesis of Phenanthrene.
11. Give the reaction of anthracene.
12. Give in detail about the reaction of cyclopropane.
13. Give in detail about the reaction of cyclobutane.
14. Explain Coulson-moffit modification.
15. Explain synthetic uses of aryl diazonium salt..



  
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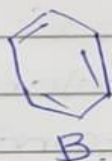
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## Tutorial-1

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1) Give brief explanation in resonance of benzene.

- In order to understand the concept of resonance theory in benzene let us consider two valence structure A & B for benzene



- The difference which identified between A & B is that position of double bond gets change.
- All six bonds are equivalent & are intermediate between double & single in actual structure of benzene
- The bonds which are formally double in A & B do not really behave chemically like double bonds but as much more stable & reactive functionally.

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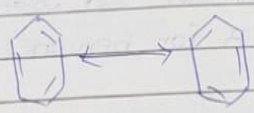
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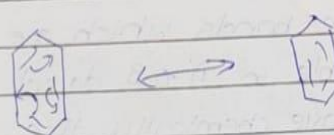
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- In using resonance theory to adapt our standard representation to more accurately represents resonance stabilise molecules.



- These valence structure are called resonance structures of conical structure because individually they do not adequately represents structure of real compound.

- Electrons in bond or on atoms may be moved using the curved arrow.



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Tutorial-2

2) Explain Huckle's Rule

- In 1931, German chemist & physicist Erich Huckle proposed a rule by determining if planar ring molecules would have aromatic properties.

- This rule states that if cyclic planar molecule has  $4n+2\pi$ .

- A cyclic ring molecule follows Huckle's rule when number of  $\pi$  electrons equal  $4n+2$  where,

$n = \text{zero or any positive integer}$

- Huckle's rule was organizing based on calculations using Huckle's method.

- Aromatic compound are more stable than theoretically predicted by alkene hydrogenation data.



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### BP303T Pharmacognosy Microbiology – Theory

Prepare 10 multiple choice questions (MCQs) with four options (Underline correct option).

Sr. No	Topics	Sr. No	Topics
01	Introduction, history of microbiology, its branches, scope and its importance, Introduction to Prokaryotes and Eukaryotes	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
02	Study of ultra-structure and morphological classification of bacteria, Nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve	10	Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids
03	Isolation and preservation methods for pure cultures, cultivation of anaerobes, quantitative measurement of bacterial growth (total & viable count)	11	Assessment of a new antibiotic and testing of antimicrobial activity of a new substance. General aspects- environmental cleanliness
04	Study of different types of phase contrast microscopy, dark field microscopy and electron microscopy	12	Study of morphology, classification, reproduction/replication and cultivation of Virus
05	Identification of bacteria using staining techniques (Simple, Gram's & Acid fast staining) and biochemical tests (IMViC)	13	Types of spoilage, factors affecting the microbial spoilage of pharmaceutical products, sources and types of microbial contaminants, assessment of microbial contamination and spoilage
06	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	14	Preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations
07	Study of morphology, classification, reproduction/replication and cultivation of Fungi. Classification and mode of action of disinfectants	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
08	Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions. Evaluation of bactericidal & bacteriostatic		





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## Tutorial work

PAGE NO.:

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1] Topic:- History & branched of microbiology, scope & importance of microbiology.

1] It deals with the study of causative agents of infectious diseases in human beings.

a] Soil Microbiology b] Air microbiology  
c] Medical microbiology d] Food microbiology.

2] Who observe the first human shape of RBC cells.

a] Antony van Leeuwenhoek  
b] Louis Pasteur  
c] Robert Koch  
d] Lord Joseph Lister.

3] Methods is use to killing of microorganisms.

a] moist heat sterilization  
b] dry heat sterilization  
c] membrane filtration d] All of this



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

Academic Year 2023-24

### BP 304T Pharmaceutical Engineering – Theory

Sr No	Tutorials
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.
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 meter.
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.



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## Tutorial - 1

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1) Write a principle & draw a labelled diagram of FBD.

Ans Fluidized Bed Dryer (FBD)

Fluidized (Fluid) bed dryers are used extensively in the pharmaceutical industries to prepare granules of desired moisture content in the production of the tablets.

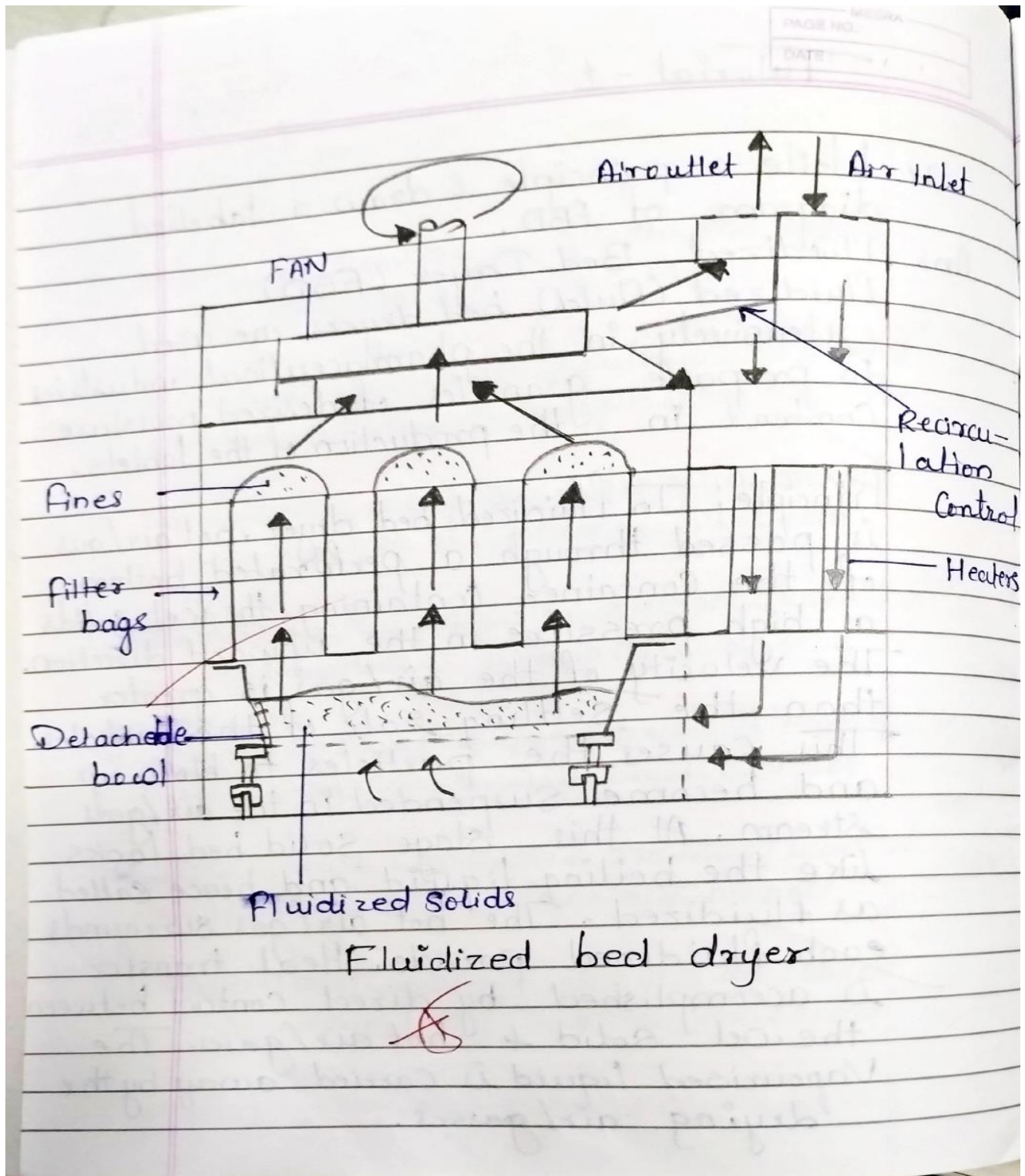
Principle: In fluidized bed dryer, hot air/gas is passed through a perforated bottom of the container containing the wet solids at high pressure in the upward direction. The velocity of the air/gas is greater than the settling rate of the particles. This causes the particles to blow up and become suspended in the air/gas stream. At this stage solid bed looks like the boiling liquid and hence called as fluidized. The hot air/gas surrounds each fluidized particle. Heat transfer is accomplished by direct contact between the wet solid & hot air/gases. The vapourised liquid is carried away by the drying air/gasses.





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Fluidized bed dryer

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

**Academic Year 2023-24**

### **BP302T Physical Pharmaceutics I – Theory**

#### **Tutorial 1**

Q. Define solubility and explain the ways of expressing solubility.

#### **Tutorial 2**

Q. What is the supersaturated solution? Add a note on mechanism of solute solvent interaction.

#### **Tutorial 3**

Q. Write in brief about Raoult's law and its significance.

#### **Tutorial 4**

Q. What do you mean by states of matter? Add a note on sublimation critical point.

#### **Tutorial 5**

Q. Define aerosol. Give principle, construction and working of it.

#### **Tutorial 6**

Q. Explain in detail about refractive index and optical rotation as a physicochemical property of drug molecule.

#### **Tutorial 7**

Q. Write in detail about surface tension and interfacial tension.

#### **Tutorial 8**

Q. Give methods of surface tension determination.

#### **Tutorial 9**

Q. What do you mean by HLB scale? Give its significances.

#### **Tutorial 10**

Q. Define complexation and give detail classification of it.

#### **Tutorial 11**

Q. Prepare 15 MCQs on complexation and protein binding.

#### **Tutorial 12**

Q. What is crystalline structure of complexes? Write its significances.



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### Tutorial 13

Q. Define pH and add a note on pH scale and application of it.

### Tutorial 14

Q. Give detail account of pH determination methods.

### Tutorial 15

Q. What do you mean by buffer & buffer capacity? Write the importance of buffer in Pharmaceutical and biological system.

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Tutorial-1

1. Define Solubility and Explain the modes of expressing solubility.

- Solubility -  
Solubility is defined as the concentration of a substance (solute) that dissolves in a given volume of solvent at a certain temperature to form homogeneous solution.

- Modes of expressing solubility.  
The solubility of a drug or other substance in a solvent can be expressed in terms through Percent by mass, percent by volume, molality (m), molarity (M), mole fraction (X), and parts per million (ppm). etc.

1. Normality (N) -  
It is defined as no. of equivalents of solute dissolve in one litre of solution.

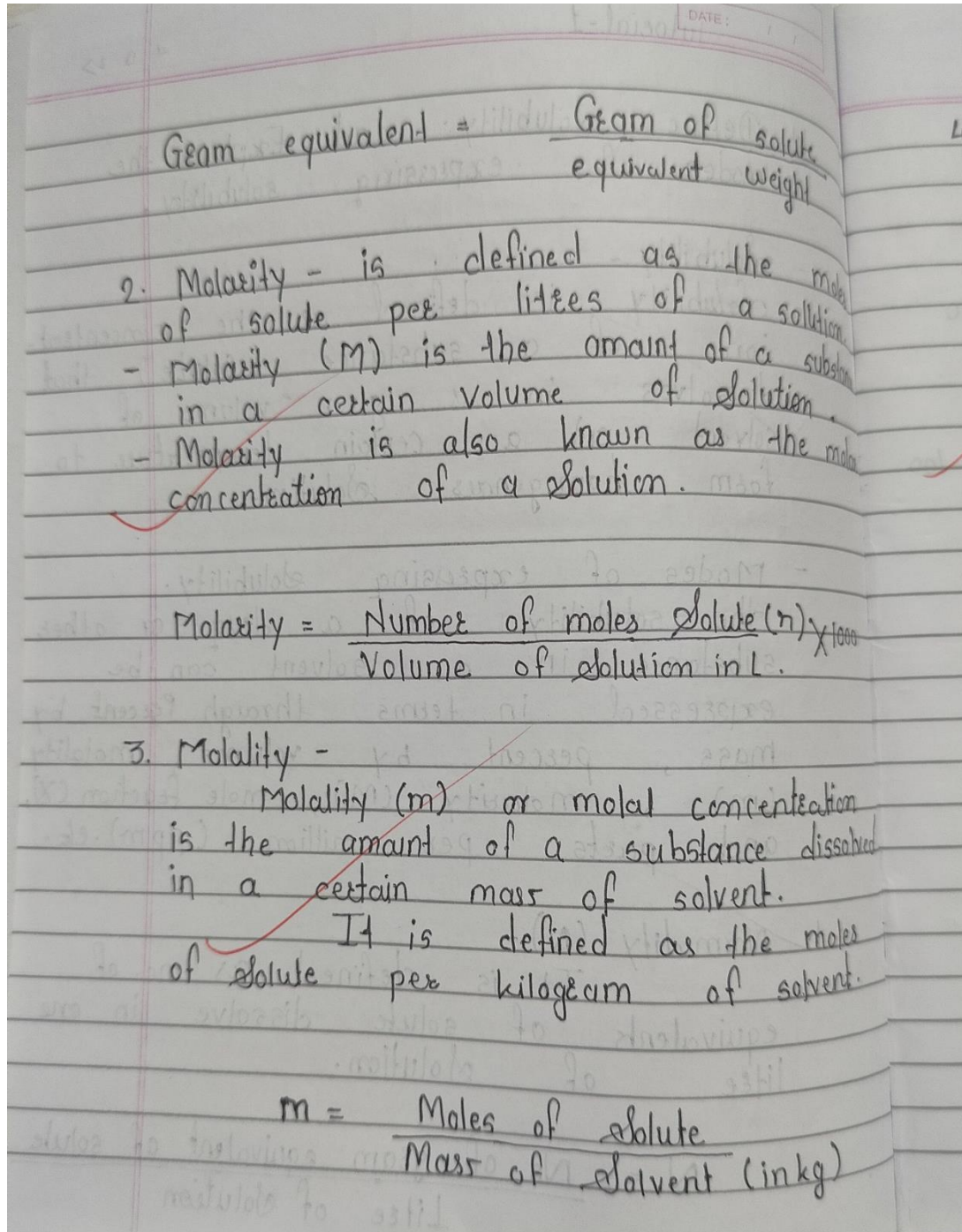
$$N = \frac{\text{No. of gram equivalent of solute}}{\text{Litree of solution}}$$





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4. Mole fraction -

the ratio of the number of moles of one component of a solution or other mixture to the total number of moles representing of the components.

$$X_A = \frac{\text{Moles of solute (A)}}{\text{Total Moles of solution.}}$$

5. Percentage by weight.

Percentage mass (Percentage by weight) is the percent of the total mass of the solution that is one component.

$$\text{Percent by mass} = \frac{\text{Mass fraction}}{\times 100}$$

6. Percentage by Volume :-

Volume / Volume Percentage is a measure of concentration of a substance in a solution.

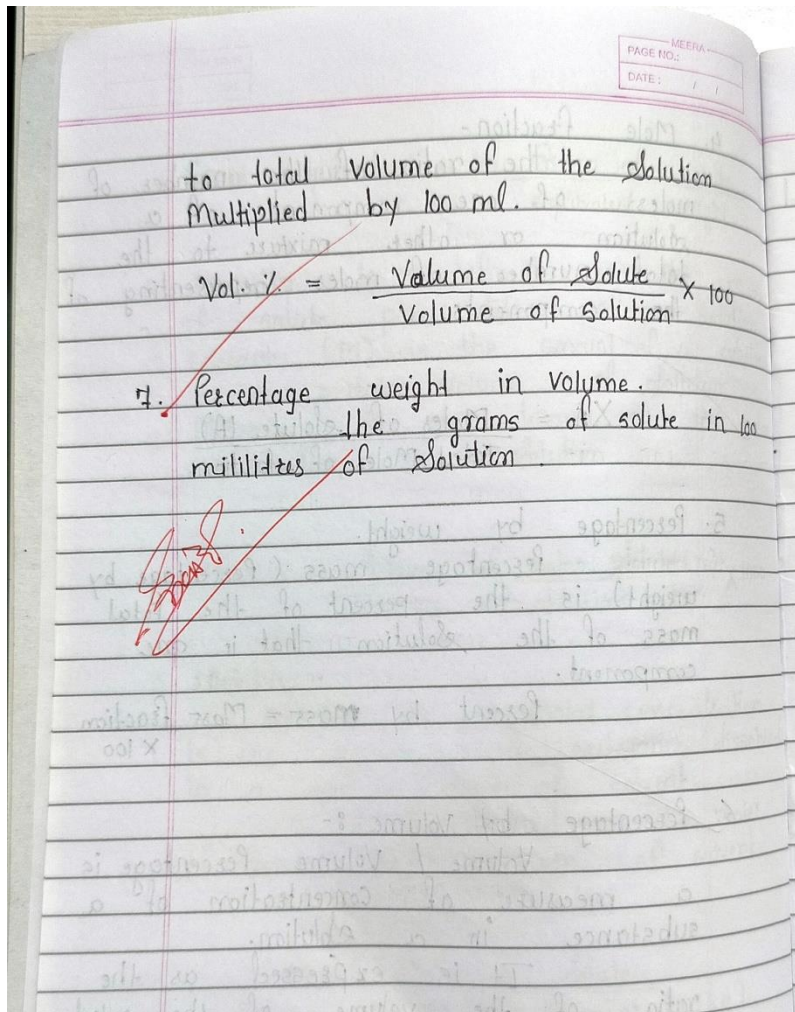
It is expressed as the ratio of the volume of the solute





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**Academic Year 2023-24**

**BP405T Pharmacognosy and Phytochemistry I – Theory**

Prepare **10 separate MCQs with correct option underlined** on the following topics by individual student. (Avoid repetition of MCQs)

<b>Tutorial No.</b>	<b>Topic</b>
01	Definition, history and scope of Pharmacognosy
02	Sources of drugs, Organized and unorganized drugs
03	Classification of drugs
04	Adulteration of drugs
05	Evaluation of drugs by organoleptic and microscopic methods
06	Evaluation of drugs by chemical and biological methods
07	Factors affecting cultivation of medicinal plants
08	Plant hormones, polyploidy, mutation, hybridization
09	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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## Tutorial - I

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① Define history & scope of Pharmacognosy

① Pharmacognosy is the study of  
a) crude drug b) medicine  
c) drug d) source of drug

2. Neem is source  
a) animal b) Plant  
c) chemical d) microorganism

3) Tissue culture is cultivation of plant  
a) In-vitro b) In-vivo  
c) Test tube d) Natural

4) Organized drug have  
a) non-structured cell wall  
b) structured cell wall  
c) Non specific  
d) Specific drug

5) The meaning of pharmac is -  
a) knowledge b) Science  
c) drug d) application



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**Academic Year 2023-24**

**BP401T Pharmaceutical Organic Chemistry III– Theory**

**Tutorial 1:** Define & classify stereoisomer with example

**Tutorial 2:** What do you mean by racemic mixture & racemic modification? Explain various methods of resolution of a racemic mixture.

**Tutorial 3:** Give the various method for determination of geometrical isomers

**Tutorial 4:** Explain in detail the RS system of nomenclature of optical isomers.

**Tutorial 5:** What are stereoselectivity and stereospecificity? Explain it with a suitable example.

**Tutorial 6:** Explain the reaction & mechanism involved in Backmanns rearrangements.

**Tutorial 7:** Explain the reaction & mechanism involved in the Schmidt reaction.

**Tutorial 8:** Explain synthesis, reactions & medicinal uses of furan

**Tutorial 9:** Explain synthesis, reactions & medicinal uses of thiophene

**Tutorial 10:** Explain the synthetic method & two characteristic reactions for Imidazole & pyrrole

**Tutorial 11:** Give any two methods of preparation & chemical reaction of pyridine.

**Tutorial 12:** Explain the chemical reactions of Quinoline and Isoquinoline

**Tutorial 13:** Write a note on reactions and synthesis of Indole.

**Tutorial 14:** Write synthesis and medicinal uses of Pyrimidine.

**Tutorial 15:** Comment on electrophilic substitution in five-membered heterocycles.



  
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## Tutorial No:- 1

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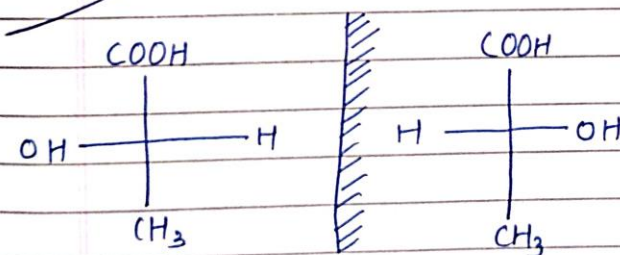
Q.1) Define and classify stereoisomers with example.

→ Stereoisomerism compound have the same molecular formula but differ from each other in physical or chemical properties.

### Stereoisomerism

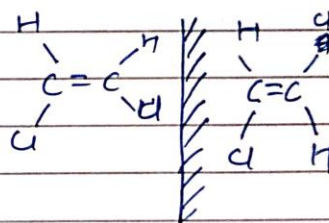
Optical  
Isomerism

eg. Lactic acid  
( $C_3H_5O_3$ )



Geometrical  
Isomerism

eg. cis and trans



→ Optical Isomerism :- Optical isomerism occurs mainly in substances that have the same molecular formula and structural formula but they cannot



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## Tutorial No:-2

Q.2] What do you mean by racemic mixture and racemic modification? Explain various methods of resolution of a racemic mixture.

→ Racemic Mixture :-

A mixture having equal amounts of enantiomers is called racemic mixture.

Racemic modification :-

It is the process of separation of a racemic modification into enantiomers constituents.

Resolution of Racemic mixture :- It is the process of separation of a racemic modification into its enantiomers constituents. Also in this process optically inactive compound is converted into optical active compounds.

• Methods used for resolution :-

Q. Mechanical Method :-

In this method, firstly crystallized the both enantiomers in racemic mixture. Now both have different shapes from each others. So they





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

**Academic Year 2023-24**

### **BP403T Physical Pharmaceutics II – Theory**

#### **Tutorial 1**

Q. What do you mean by colloidal dispersion? Give detail account of their general characteristics.

#### **Tutorial 2**

Q. Explain in detail optical and electrical properties of colloids..

#### **Tutorial 3**

Q. Frame at least 15 MCQs on colloidal dispersion.

#### **Tutorial 4**

Q. What do you mean by newtonian system? Explain in detail.

#### **Tutorial 5**

Q. What are the non- newtonian system? Explain in brief dilatant and pseudoplastic flow.

#### **Tutorial 6**

Q. Define viscosity; enlist different viscometers and explain in brief cup and bob viscometer.

#### **Tutorial 7**

Q. What do you mean by suspension? Comment on interfacial properties of suspended particles.

#### **Tutorial 8**

Q. Define emulsion and explain theory of emulsification.

#### **Tutorial 9**

Q. Write detail note on emulsion formulation by HLB method.

#### **Tutorial 10**

Q. Define micromeritics; add a note on particle size and its distribution.

#### **Tutorial 11**

Q. Enlist and explain any one method for particle size determination.

#### **Tutorial 12**

Q. What are the derived properties of powder explain in detail.

#### **Tutorial 13**

Q. What do you mean by drug stability? Explain in brief second order kinetics.

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## Tutorial 14

Q. Enlist and explain physical and chemical factors influencing stability of pharmaceutical product

## Tutorial 15

Q. Write a note on accelerated stability study.

Tutorial No. 2

Qe) Explain in detail optical & Electrical properties of colloids

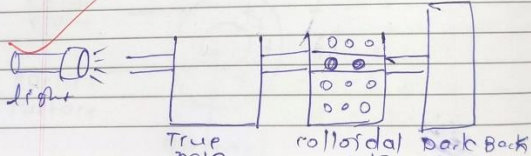
→ Optical properties:

Optical properties of colloids help in obtaining info. regarding their size, structure & mole. wt. of colloid.

a) Tyndall Effect:

Tyndall effect is observed at interaction of particles with light when an intense narrow beam of light is passed through the dispersion of colloid in path. In visible dir. scattered light & this scattered beam of light is known as Tyndall beam.

This beam is most visible viewed from dark background & is incident beam.



True Sol      Colloidal Sol      Dark Back

net charge will be zero. This is termed as isoelectric pt. of protein. Protein exists in its zwitter ion or represented follows:

$R-NH_2-COO^-$	Alkaline soln
$\downarrow$	
$R-NH_3^+-COO^-$	Isoelectric soln
$\downarrow$	
$R-NH_3^+-COOH$	Acidic soln

• Ion Adsorption:

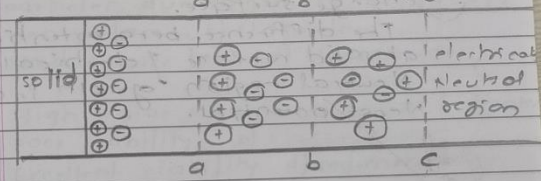
Surface in water are more often negatively charged than they are positively charged because cations are generally more hydrated than anions. Consequently the former have greater tendency to reside in bulk, & medium whereas smaller less hydrated & more polarizing anions have a greater tendency to reside at particular surface. Anions are strongly adsorbed & have a pronounced influence on surface charge.



2) Electrical properties of colloids

d) Surface ionization:  
In this charge is controlled by ionization of surface groupings.  
ex. carboxymethyl cellulose frequently has  $\text{COOH}$  grouping of surface which ionize to give very charged particle. Amino acid of proteins acquire their charge mainly through ionization of carboxyl & AA groups to give  $\text{COO}^-$  &  $\text{NH}_3^+$  ion. The ionization of these groups hence the net molecular charge depend on pH of system. At pH below the pKa of  $\text{COOH}$  group, protein will be fully charged because  $\text{NH}_3^+$  which has much higher pKa whereas at higher pH inter amino group is no longer ionized but charged on molecule is now because of ionization of carboxyl group at certain finite pH specific for each individual protein of total no. of the charge will equal total no. of the charge.

c) Electrical double layer:  
The theory of electric double layer deals with distribution of ions near the surface with magnitude of electric potential that occurs in localizing of charged surface consider a solid charged surface in contact with an aqueous solution of electrolyte.



Suppose that some of cations are adsorbent on to solid surface giving it a net charge if there are called potential determining ions then counter anions are attached to the charged surface by electric forces forms a region called tightly bound layer. In this layer, there

are fewer anions / cations hence potential at bb is the.

In addition to these electrical forces the thermal motion tend to produce ion equal distribution of all ions in solution as result some of excess anion approach surface whereas remainder are distributed in solution and are proceed from charge surface.

The difference between potential at solid surface & electrically neutral region of solution is called Nernst potential.



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

**Academic Year 2023-24**

#### **BP402T Medicinal Chemistry – Theory**

1. Define Lead. Give its sources of Optimization.
2. Explain Bioisosterism and its application on biological action
3. Explain Ionization and Partition Coefficient.
4. Discuss about neurotransmitters in body
5. Write in brief about biosynthesis of catecholamine
6. I. Write a classification of sympathomimetic agents  
II. Write SAR of Adrenergic agents
7. Discuss SAR of  $\beta$  blockers.
8. Write in brief about chemistry of acetylcholine.
9. Write the short note on choline esterase reactivator. Write SAR of cholinolytic.
10. Discuss SAR of Barbiturate, Phenytoin and Benzodiazepines.
11. Write 5 MCQ's on Sympathomimetic agents
12. Write 5 MCQ's on Parasympathomimetic agents
13. Write the classification and stages of G.A.
14. Give the MOA of NSAID.
15. Give SAR of mepiride series and classification of Opioid analgesics



  
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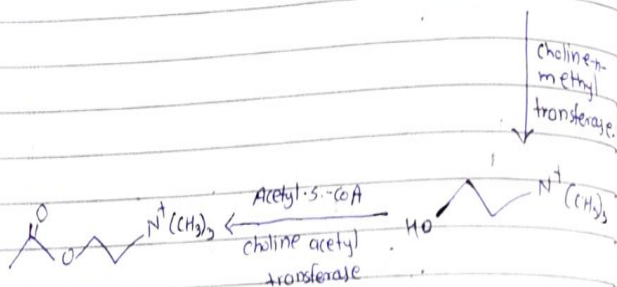
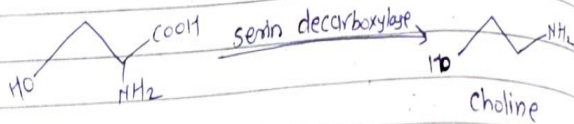
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### Tutorial-9

Q.8. Write the chemistry of charetylcholine.

Ans 8



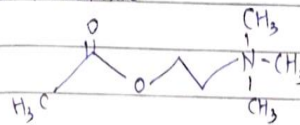
Acetyl choline

Transported in vesicles.

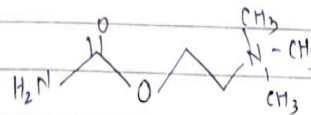
- Serine are converted into choline in the help of enzyme serine decarboxylase the Carboxyl group are removed.
- Then the choline are converted into acetylcholine with the help of choline-n-methyl transferase in the presence of S-adenosyl methionin. The choline are converted into acetylcholine with the acetate and enzyme or choline acetyl transferase.

• Classification of parasympathomimetic :-

- Receptor
- Direct acting agent
- Muscarinic.

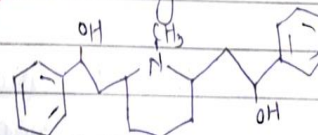


Acetylcholine



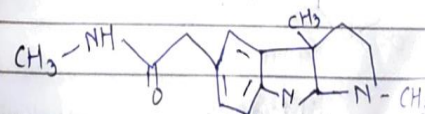
Carbachol

ii) Nicotinic drug :-

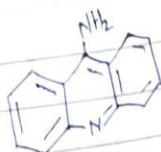


Labeline

- Indirect acting agent :-
- Reversible indirect acting.

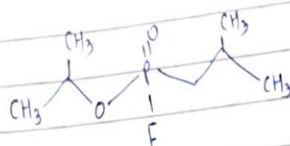


pyridostigmine

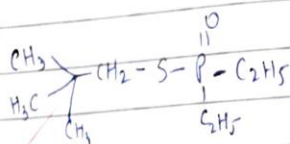


Tacrine

ii) Irreversible indirect acting

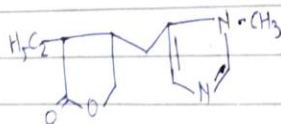


Isoflurophate



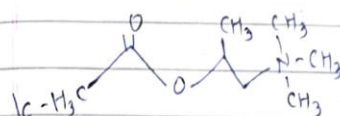
• SAR of parasympathomimetic :-

1) Replacement of nitrogen by other atoms like sulphur, arsenic or selenium lead to decrease into the activity.



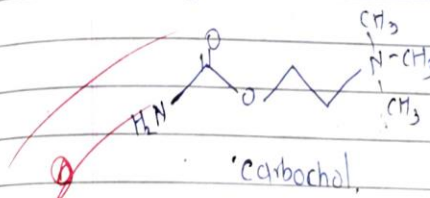
pilocarpine

2) Ester of aromatic acid possesses cholinergic antagonist activity.



methacholine -Cl<sup>-</sup>

3) NH<sub>2</sub> group can be introduced in place of CH<sub>3</sub>. It is more stable than carbonylated ester toward hydrolysis.



Carbachol





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## **BP701T Instrumental Methods Of Analysis**

**(Tutorial)**

**Sem VII \_ A Y 2023-24**

1. Comment on type of electrons & electronic transitions involved in UV-spectroscopy.
2. Add a note on Beer's & Lambert's law.
3. What are the factors affecting fluorescence intensity.
4. Describe in details about vibrations in IR Spectroscopy.
5. Explain instrumentation of Flame Photometry give its applications.
6. Discuss the principle and applications of Atomic absorption spectroscopy.
7. Explain the instrumentation of Nephelo-turbidimetry.
8. Write principle, advantages, disadvantages & applications of TLC.
9. Give principle and explain various steps involved in Paper chromatography.
10. Explain the factors offering electrophoretic mobility.
11. Explain the types of detectors used in Gas chromatography.
12. Explain applications of HPLC with a schematic diagram.
13. Explain the ion exchange resins for Ion exchange Chromatography.
14. Write a note on Gel chromatography.
15. Explain instrumentation of Affinity chromatography



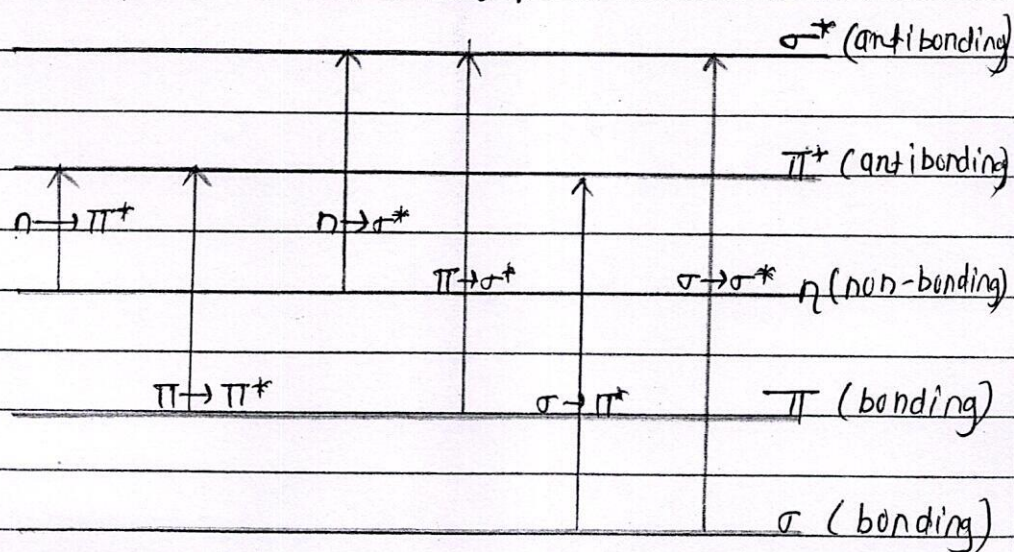
## Tutorial No: 1

Q. Comment on types of electrons & electronic transitions involved in UV-spectroscopy.

→ Types of electrons:

- 1]  $\sigma$  (sigma) electrons: Involved in single bonds
- 2]  $\pi$  (pi) electrons: Involved in multiple bonds, such as double & triple bonds
- 3]  $n$  (non bonding electrons): Localized on heteroatoms (eg.  $O_2, N$ ) not involved in bonding.

• Electronic transitions:





1)  $\sigma \rightarrow \sigma^*$  transition  $\rightarrow$

- $\sigma$  electron from orbital is excited to corresponding anti-bonding orbital  $\sigma^*$
- The energy required is large for this transition.

2)  $\pi \rightarrow \pi^*$  transition  $\rightarrow$

- compounds like alkenes, alkynes, carbonyl, nitriles, aromatic compounds containing multiple bonds undergo  $\pi \rightarrow \pi^*$  transition.

3)  $n \rightarrow \sigma^*$  Transition:-

- saturated compounds containing atoms with lone pair of electrons like O, N, S & halogens are capable of  $n \rightarrow \sigma^*$  transition.
- requires less energy than  $\sigma \rightarrow \sigma^*$  trans.

4)  $n \rightarrow \pi^*$  transition :-

- compound containing double bond involving heteroatoms ( $C=O$ ,  $C \equiv N$ ,  $N=O$ ) undergo such transitions.



- requires minimum energy

5]  $\sigma \rightarrow \pi^*$  &  $\pi \rightarrow \sigma^*$  transition  $\rightarrow$

- These electronic transitions are Forbidden transitions & are only theoretically possible.



## Tutorial NO: 2

PAGE NO.:

DATE: / /

Q Add a note on Beer's & Lamberts law  $\rightarrow$

Q] Lambert's law :-

It states that when a beam of monochromatic radiation passes through a homogeneous absorbing medium, the rate of decrease of intensity of radiation with thickness of absorbing medium is proportional to intensity of incident radiation.

Mathematically, the law is expressed as  $-\frac{dI}{dx} = KI$

Let  $I_0$  be the intensity of radiation before entering into absorbing medium ( $x=0$ )

Then  $I$ , the intensity of radiation after passing through any thickness

say  $x$

$$\int_{I_0}^I \frac{dI}{I} = \int_{x=0}^{x=x} K dx$$

$$= \ln \frac{I}{I_0} = -Kx$$



$$2.303 \log \frac{I}{I_0} = -kx$$

$$\log \frac{I}{I_0} = \frac{-kx}{2.303}$$

$$A = \frac{kx}{2.303}$$

$$A = E \cdot x$$

Absorption &amp; Thickness

b) Beer's law:

This law states that when a beam of monochromatic radiation is passed through a sol<sup>n</sup> of absorbing sub. the rate of decrease of intensity of radiation with thickness or absorbing sol<sup>n</sup> is proportional to intensity of incident radiation as which thickness of absorbing sol<sup>n</sup> is proportional to intensity

$$\frac{-dI}{dx} = KIC$$

Suppose  $I_0$  be the intensity of radiation before entering into



absorbing medium when thickness  
 $x = 0$

$$\therefore \int_{I_0}^I \frac{dI}{I} = \int_{x=0}^{x=x} k' dx c$$

$$\ln \frac{I}{I_0} = -k'cx$$

$$2.303 \log \frac{I}{I_0} = -k'cx$$

$$= \log \frac{I}{I_0} = \frac{-k'cx}{2.303}$$

$$A = \frac{k'}{2.303} cx$$

$$\boxed{A = \epsilon \cdot cx}$$

absorption  $\propto$  Thickness  $\times$  concentration





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**List of Tutorials (Final Year B. Pharmacy)**

**Academic Year 2023-24**

**BP 702 T Industrial Pharmacy – II – Theory**

Sr. No.	Tutorials
1.	What is pilot plant scale up?
2.	Give the pilot plant consideration for solid formulations
3.	What are SUPAC guidelines? Discuss in detail
4.	Write in brief about the technology transfer protocol
5.	Write in brief about the quality risk management
6.	Management of Clinical Studies
7.	Contents of the Investigational New Drug (IND) Application
8.	Investigator's Brochure
9.	Explain the principles of Total Quality Management
10.	Define the various concepts in the Quality by Design (QbD)
11.	Write in brief about the Out of Specifications (OOS)
12.	Write in brief about NABL
13.	Central Drug Standard Control Organization (CDSCO)
14.	Certificate of Pharmaceutical Product (COPP),
15.	Regulatory requirements and approval procedures for New Drugs

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## Tutorial : 4.

Q. Write in brief about tech. transfer protocol.



The transfer process should be managed by SU & RU. If required, an additional agency in which proper directions and approvals are provided. There should be a proper management plan and format agreement for TT.

Following steps would be followed as per TT protocol.

- 1) purpose and objective of transfer
- 2) scope of transfer
- 3) skilled personnel.
- 4) Compensation of materials.
- 5) Documented evidence
- 6) The transfer of documented
- 7) assessment of CCP.
- 8) Assessment of expt.
- 9) Information of different batches.





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PAGE NO.:
DATE: / /

### Purpose of guidance:-

- 1) The component / composition
- 2) The site of manufacture
- 3) The scale up / down mfg.
- 4) mfg. process / equipment.

### Level of changes

- minor
- moderate
- major.

19/07/23

- 1)
- 2)
- 3)
- 4)
- 5)
- 6)
- 7)
- 8)
- 9)





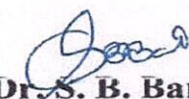
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**List of Tutorials (Final Y. B. Pharmacy)**  
**Academic Year 2023-24**  
**BP704T\_Novel Drug Delivery System– Theory**

Tutorial number	Tutorial Questions
	A Division (VKC)
1	Give classification of polymers
2	Explain the concept sustained & CRDDS ?
3	Enlist different approaches designing CRDDS.
4	Enlist Factors affecting Formulation For TDDRS.
5	Enlist approaches for retentive DDS
6	Give principle & gastro-mucoadhesion.and bio adhesion
7	Give advantage of mucosal drug delivery system
8	Enlist method of encapsulation (micro)
9	Write the concept of implant & armatic pump. 10. 4/9/23 Explain the concept of navopulmonary drug delivery system
10	Write method to overcome challenge occur in ocular drug delivery system.
11	Write method to overcome challenge occur in ocular drug delivery system.
12	Enlist ocular formulation & write in detail about ocuserts.
13	Give advantages and disad. vantages of intrauterine drug delivery system.
14	Explain the concept of drug delivery system.
15	Enlist approaches for targeted drugs



  
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## Tutorial : 1

Q.1. Give classification of polymers.

→ Classification :

① Based on origin / source

- a. Natural polymers
- b. Synthetic polymers
- c. Semisynthetic polymers

② Based on structure

- a. Linear polymer
- b. Branched chain polymer
- c. Cross-linked polymer

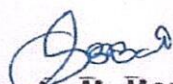
③ Based on molecular forces

- a. elastomers
- b. fibres
- c. Thermoplastic
- d. Thermosetting polymers

④ Based on mode of polymerisation

- a. Addition polymer
- b. Condensation polymer



  
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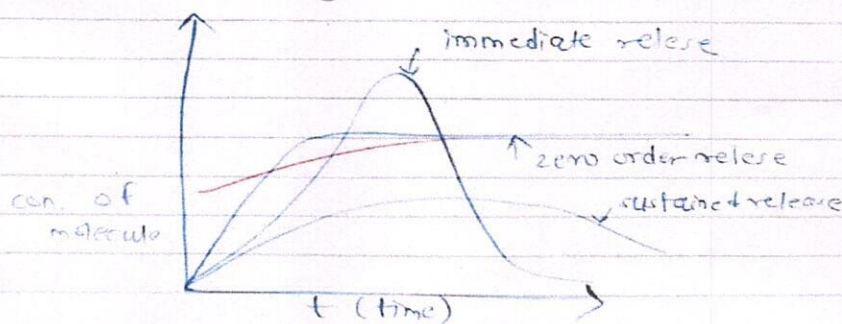
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## Tutorial: 2

Q. Explain the concept, sustained release and controlled release drug delivery system

- • Sustained released drug delivery system :  
Many provide an immediate dose required for the normal therapeutic response followed by graphical released of drug in amounts of sufficient to maintain the therapeutic response for specific extended period of time usually 8-12 hours



- Controlled drug delivery system :  
which delivers the drug at a pre-determined ratio for locally



  
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## **List of Tutorials (Final Year B. Pharmacy)**

**Academic Year 2023-24**

### **BP804 ET Pharmaceutical Regulatory System– Theory**

<b>Sr. No.</b>	<b>Tutorials</b>
1.	Flow chart of pre-clinical trials.
2.	Flow chart of stages of drug discovery process.
3.	Flow chart stages of clinical trials.
4.	Flow chart of NDA review process.
5.	Flow chart of ANDA review process.
6.	Summary of CDSCO.
7.	Summary of TGA.
8.	Summary of USFDA.
9.	Summary of MHLW.
10.	Summary of Belmont Report.
11.	Summary of Helsinki Declaration.
12.	Duties of Principle investigator.
13.	Duties of Sponsor.
14.	Outline of Clinical trial protocol.
15.	Flow chart of procedure for export of pharmaceutical products.

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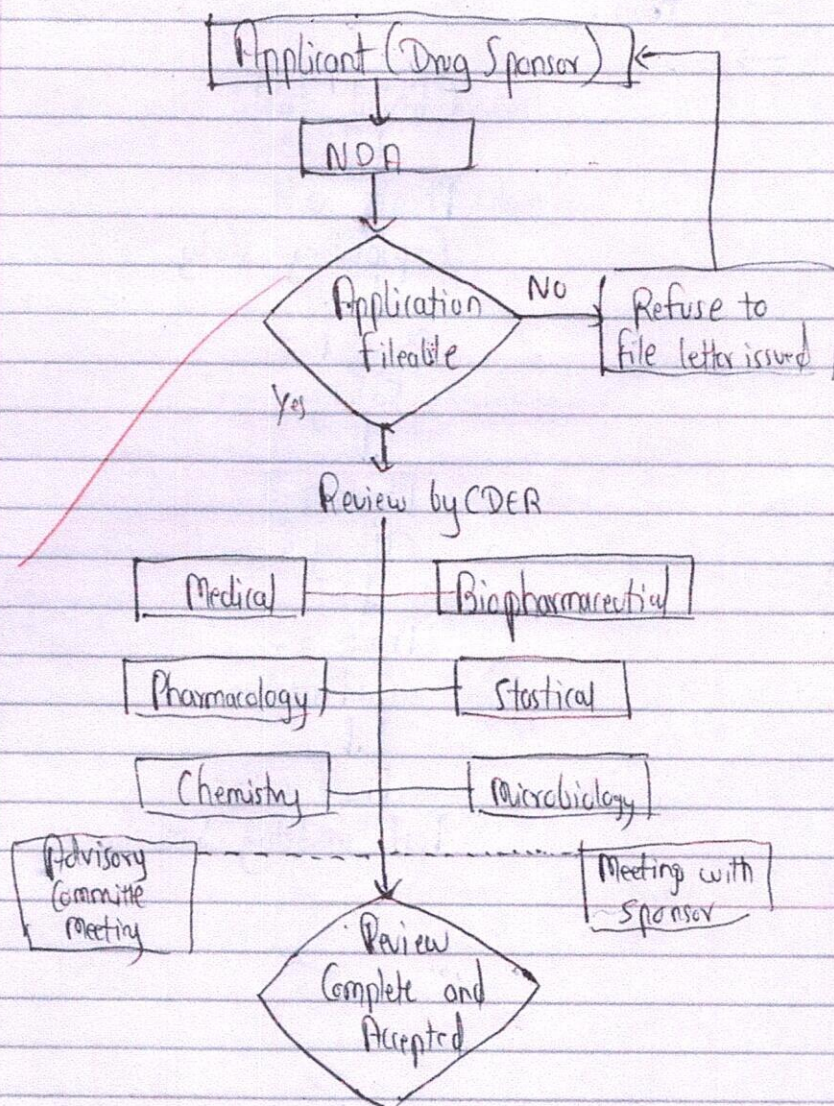


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### Tutorial No:- 4

#### Flow chart of NDA review process.

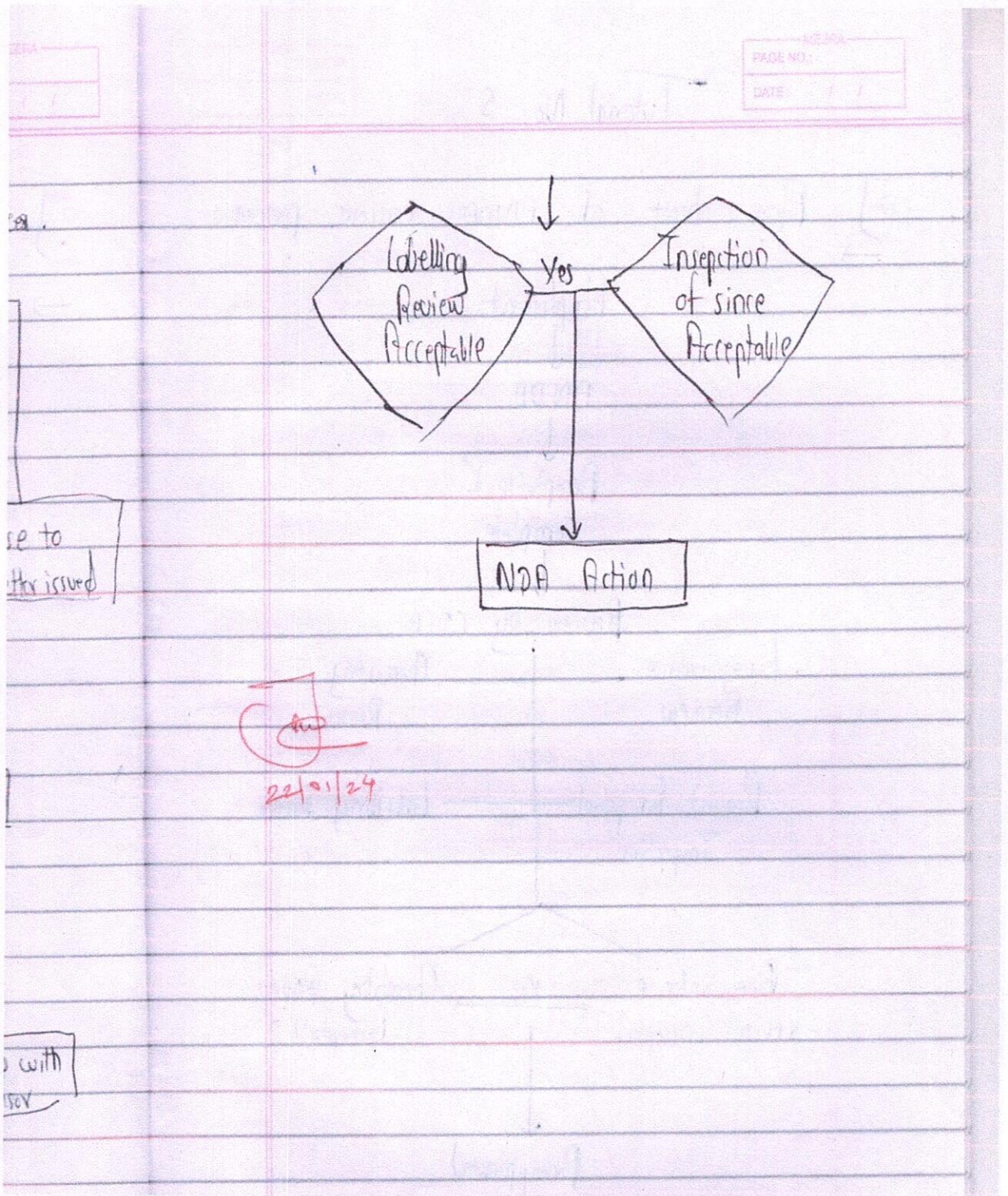






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## **List of Tutorials (Final Year B. Pharmacy)**

**Academic Year 2023-24**

### **BP802T Social and Preventive Pharmacy– Theory**

1. Prepare MCQ on with answer on topic **Concept of health and disease.**
2. Prepare MCQ on with answer on topic **Social and health education.**
3. Prepare MCQ on with answer on topic **Sociology and health.**
4. Prepare MCQ on with answer on topic **Hygiene and health.**
5. Write note on prevention and control of cholera, influenza and SARS.
6. Write note on Prevention and control on diabetes and cancer.
7. Explain in details HIV and AIDS programme.
8. Elaborate national mental health programme.
9. Explain pulse polio programme.
10. Discuss the role of WHO Indian national programme.
11. Give details about intervention programme for mother and child.
12. Describe tuberculosis programme mission and objective.
13. Write down function of PHC.
14. Elaborate tobacco control programme.
15. Describe National urban health mission.

**Mr S.K. Amale**

Subject in-Charge

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### Tutorial-5

Q write note on <sup>prevention</sup> correlation and control of cholera, influenza and SARS

→ \* cholera -

- 1) safe water and sanitation - Ensuring access to clean water and proper sanitation facilities is crucial in preventing cholera transmission. Improving water quality and promoting hygiene practices such as handwashing can reduce the risk of contamination.
- 2) vaccination - vaccination against cholera can provide protection for individuals in endemic areas or during outbreaks. Oral cholera vaccines are available and recommended for travellers to regions with known cholera outbreaks.
- 3) public health education - Educating communities about cholera transmission, symptoms and preventive measures is essential for early detection and response. Promoting safe food handling practices and encouraging proper waste disposal can also contribute to cholera prevention.

\* SARS (Severe Acute Respiratory Syndrome) :-

- 1) Infection control measures: Implementing strict infection control measures in healthcare settings, including proper use of personal protective equipment (PPE) such as masks, gloves and gowns, can help prevent nosocomial transmission of SARS.
- 2) Isolation and quarantine: Identifying and isolating suspected SARS cases along with quarantining close contacts can help contain the spread of the virus within communities and prevent further transmission.
- 3) Travel restrictions: Implementing travel advisories and restrictions in regions affected by SARS outbreaks can reduce the spread of the virus across borders and limit its global impact.

\* Influenza :-

- 1) vaccination - Annual influenza vaccination is recommended, especially for high risk individuals such as the elderly, young children, pregnant women, and individuals with underlying health condition. Vaccination helps reduce the severity of illness and prevent complications.
- 2) personal hygiene - practice good respiratory hygiene, such as covering cough and sneezes with a tissue or elbow, and regular handwashing with soap and water can help prevent influenza transmission.
- 3) social distancing measures - During influenza outbreaks, implementing social distancing measures such as avoiding crowded places, staying home when sick, and maintaining physical distance from individuals with flu-like symptoms can help reduce transmission rate.



## Tutorial-1

\* MCQ

- 1) What is health?
  - A. Absence of disease
  - ☒ B. Complete physical well-being
  - C. Presence of mental illness
  - D. Lack of social connections
- 2) Which model of health emphasizes the interaction of biological, psychological, and social factors?
  - A. Biomedical model
  - B. Ecological model
  - C. Social model
  - ☒ D. Biopsychosocial model
- 3) What is the primary focus of preventive medicine?
  - A. Treating existing disease
  - ☒ B. Early detection and intervention
  - C. Rehabilitation
  - D. Palliative care

7

- 7) What is the purpose of the WHO (World Health Organisation)?
  - A. Provide medical insurance
  - ☒ B. Combat infectious disease
  - C. Conduct scientific research
  - D. Promote specific diets
- 8) Which level of prevention focuses on minimising the impact of established disease?
  - A. Primary prevention
  - B. Secondary prevention
  - ☒ C. Tertiary prevention
  - D. Quaternary prevention
- 9) What is the term for the ability of an organism to resist infection or disease?
  - ☒ A. Immunity
  - B. Antibody response
  - C. Pathogenesis
  - D. Vaccination

9) Which of the following is a non-communicable disease?

- A. Influenza
- B. Tuberculosis
- ☒ C. Diabetes
- D. Malaria

5) What is the term for the spread of a disease within a specific population or geographic area?

- A. Pandemic
- ☒ B. Epidemic
- C. Outbreak
- D. Endemic

6) Which lifestyle factor is a major contributor to cardiovascular disease?

- A. Regular exercise
- B. Adequate sleep
- ☒ C. Smoking
- D. Vegetarian diet

10) Which of the following is a vector-borne disease?

- A. Measles
- B. Typhoid
- ☒ C. Dengue fever
- D. Tuberculosis





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## List of Tutorials (Final. Y. B. Pharmacy)

Academic Year 2023-24

### BP804ET Pharmaceutical Regulatory Science – Theory

1. Write a short note on drug master file (DMF).
2. What is CFR. Explain detail type of CFR.
3. Write a short note on CTD.
4. Write a short note on IND.
5. Write a short note on NDA.
6. Write a short note on ANDA.
7. Give difference between the submission process of IND, NDA & ANDA.
8. Enlist the parts of clinical trial protocols.
9. Draw organization structure of CDSCO.
10. Enlist the stage of drug development process.
11. Define bioequivalence, pharmacokinetic, pharmacodynamic, bioavailability & partition coefficient.
12. Write a short note on IRB board.
13. MCQ on drug approval process.
14. Draw a flow chart of IND application.
15. MCQ on clinical protocols.



  
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## Tutorial - 1

Page No.	
Date	

- Q Write a short on drug Master file (DMF)  
→ Drug Master File (DMF) is a submission to the FDA of information, usually covering the confidential details info about chemistry, safety & control of drug product or a component of drug product

### Type of DMF's -

Originally five types -

- Type I - Plant information
- Type II - Drug substance, drug product & its intermediates
- Type III - Packaging
- Type IV - Excipients
- Type V - Other information

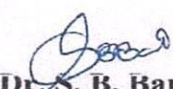
### Current types of DMF's

Now four types

- Type I DMF withdrawn
- Type II drug substance, drug product & its intermediates
- Type III Packaging
- Type IV Excipients
- Type V other information

DMF is submitted to the FDA for the info which is confidential.



  
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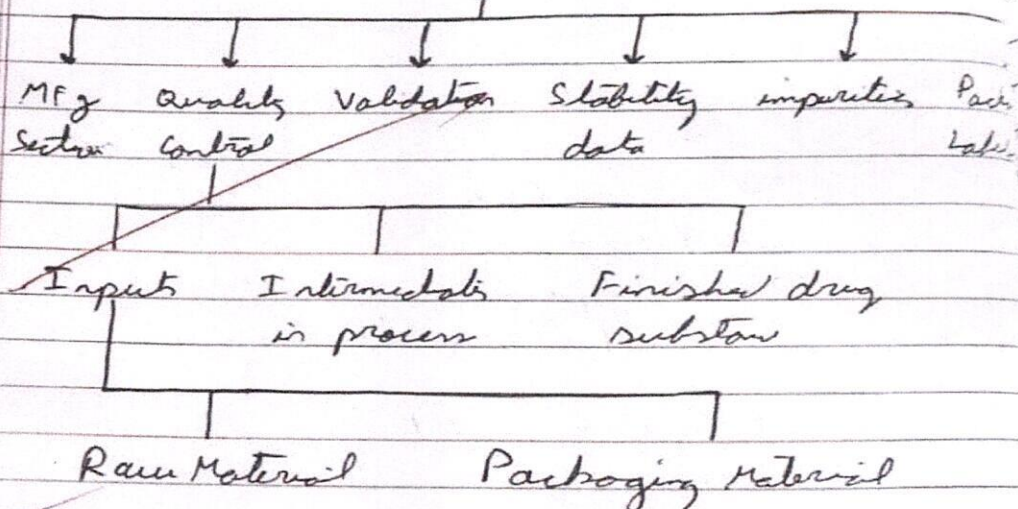
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Page No.	
Date	

Role of DMF filing  
Type 2 = 478 (77%)  
Type 3 = 46 (7%)  
Type 4 = 8 (1%)  
Type 5 = 88 (14%)

General Points include in type II DMF:



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### Term-I

### F. Y. B. Pharmacy

### List of Tutorials

Academic Year 2023-24

### BP101T Human Anatomy and Physiology I– Theory

Tutorial number	Tutorial Questions	
	A Division (PSB)	B Division (PSB)
1	Explain the structural organization of human body	Explain the structural organization of human body
2	Draw a well labelled diagram of cell and discuss its anatomy and physiology	Draw a well labelled diagram of cell and discuss its anatomy and physiology
3	Classify different types of tissues with examples	Classify different types of tissues with examples
4	Explain the function of skin	Explain the function of skin
5	Classify human bones	Classify human bones
6	What do you mean by joints	What do you mean by joints
7	Explain the composition and function of blood	Explain the composition and function of blood
8	Discuss the human blood grouping system	Discuss the human blood grouping system
9	Sketch the well labelled diagram of lymph node and explain its functions	Sketch the well labelled diagram of lymph node and explain its functions
10	Differentiate between sympathetic and parasympathetic system	Differentiate between sympathetic and parasympathetic system
11	Discuss anatomy and physiology of tongue	Discuss anatomy and physiology of tongue
12	Explain the cranial nerve with examples	Explain the cranial nerve with examples
13	Explain in detail about anatomy of heart	Explain in detail about anatomy of heart
14	Provide brief information of conduction system of heart	Provide brief information of conduction system of heart
15	List out the disorders of heart	List out the disorders of heart



  
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## List of Tutorials (F. Y. B. Pharmacy)

Academic Year 2023-24

### BP102T Pharmaceutical Analysis – Theory

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



  
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Tutorial NO : 01

05 of 2023

Q. 1) Write down Scope & Application of P.A.

Ans : The purpose of pharmaceutical Analysis is to identify substances, purify them, separate them, quantify them, determine the molecular structure of chemical compounds that make up pharmaceuticals & determine how these compounds are combined to make up a pharmaceutical product.

• Scope :-

To become a pharmaceutical Analyst, student must possess knowledge in the following areas: biology, chemistry, physics & mathematics.

The ideal candidate for the position of pharmaceutical analyst will possess a degree in pharmaceutical analysis, pharmacology, chemistry or any related subject.



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- Application :-
- Classification of a Compound according to its Chemical Properties.
- Analysis of Mixture for Compound.
- ~~#~~ Separating of a Compound from mixture.
- Purification, identification & Characterization of Compounds.
- They used to titration of Various Compound.

AW  
05.09.2023



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### List of Tutorials (F. Y. B. Pharmacy)

Academic Year 2023-24

### BP103T Pharmaceutics- I Theory

Sr. No.	Tutorials
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.	Parts of prescription and handling of prescription
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.

Mr. S. N. Jain



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### Tutorial No-5

## Parts of Prescriptions and Handling of prescriptions.

### Prescriptions :-

Prescriptions is the order written by the physician or any other medical practitioner to the pharmacist to compound or dispense specific medication for individual patients or owner of the animal.

### Parts of Prescriptions :-

#### ① Heading :-

a) Date - without date invalid prescriptions.

b) Information about prescriber

c) Information about patient -  
Name of patient, Address, Age and Gender / Sex of patient

#### ② Superscription :-

Rx, symbol which means you take.

- I

③ Ir

① N.

② Fe

③ U.

④ Su

Su

giv

reg

a)

b)

c)

⑤ T.

- In

po

a)

b)

c)

d)

e)

⑥ Si





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ndling

- It also represent [God of Healing].

③ Inscriptions :-

- ① Name of drug (Generic or Trade Name)
- ② Formulations of drugs
- ③ Unit dosage of drugs

④ Subscription :-

Subscription means information given by physician to pharmacist regarding

- a) Quantity to be dispensed / Amt to be use.
- b) Dosage form to be dispensed.

⑤ Transcription / Signa :-

- Information given by physician to patient regarding.

- a) Instruction about the amount of drug to be taken.
- b) Time
- c) Frequency of the dose to be taken.

⑥ Signature :-

*(Handwritten signature)*





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## **List of Tutorials (F. Y. B. Pharmacy)**

**Academic Year 2023-24**

### **BP104T Pharmaceutical Inorganic Chemistry – Theory**

1. Explain & enlist various sources & types of impurities.
2. Describe in details-limit test of arsenic
3. i) Write a note on IP ii) Limit test of iron
4. i) Explain in details theory of acid and base ii) Define buffer & explain mechanism of action of buffers
5. Explain in details buffer action of acid and base
6. Explain in details methods of adjusting tonicity and pH
7. i) Write in detail the buffer system of the body ii) Define anti-carries agents. Explain its activity
8. i) Define GI agents, classify acidifiers. Write a note on  $\text{NH}_4\text{Cl}$ . ii) Define antacids and classify them.
  - i) Define classify cathartics with examples. Describe  $\text{MgSO}_4$
9. ii) Define antimicrobial agents with example.
10. Write in details i) Boric acid ii) Iodine
11. Define & Classify expectorants
12. i) Discuss in detail haematinics ii) Define & classify poison & antidote with example.
13. i) What is cyanide poisoning? Explain its treatment. ii) Discuss in detail astringent.
14. Discuss in detail radioactive materials
15. Write in details radioactive decay



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## List of Tutorials (F. Y. B. Pharmacy)

Academic Year 2023-24

### BP104T Pharmaceutical Inorganic Chemistry – Theory

NAME : Pawan Harshbal Shunilal  
SUBJECT : Tutorial P.T.C. STANDARD : F.Y.  
SECTION : --- ROLL NO. : 391

INDEX

Sr. No.	DATE	TITLE	PAGE NO.	REMARKS
1	9/9/23	Explain and enlist various and types of Impurities.		
2	11/9/23	Describe in detail clearly limit test for arsenic with suitable diagram.		
3		Write a note on Indian pharmacopoeia.		
4	11/9/23	Explain in detail Theory of Acid Base.		
5	20/9/23	Explain in detail buffer action of acid and base.		
6	5/10/23	Define buffer enlist it's types and explain mechanism of action of buffer.		
7	12/10/23	Explain in detail method of Adjusting toxicity of pH.		
8	12/10/23	Write in detail buffer system of body.		
9	12/10/23	Define Anti-caries agents. Explain how fluoride produces anti-caries activity.		
10	21/10/23	Define GI agents, classify Acidifiers. Note on Ammonium chloride.		
11	21/10/23	Define antacids and classify them with examples. Write in combination always.		

Sr. No.	Date	Title	Page No.	Remarks
5	28/10/23	Define and classify Salts with suitable example. Describe <sup>maxipipride</sup> <del>mg</del> <sup>phosphate</sup> <del>phosphate</del> .		
21/10/23		Define antimicrobial agents with suitable example. Write in detail mechanism of action of antimicrobial agents.		
10	21/10/23	i) Paris acid, ii) Isotone with it's preparation.		
11	25/11/23	Define and classify reagents. Discuss the physical and chemical properties and assay for arsenic chloride.		
25/11/23		Define Emetics with mechanism of action. Define monograph of Copper Sulphate.		
12	26/11/23	Discuss in detail Hormatines.		
26/11/23		Define and classify poison and antidote. Explain with suitable example.		
13	21/12/23	What is cyanide poisoning? Explain it's treatment.		
14	31/12/23	What do you mean by radio active substance? Discuss in detail about measurement of radioactive substance.		
15	10/12/23	Write pharmaceutical application of radioactive substance.		



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### Tutorial - 1.

Q.1) Explain an various Source and the type of Impurity.

→ Source of Impurities.

- Raw material.
- Reagent
- Method
- Solvents
- Atmospheric Contamination
- Reaction with vessel
- Packaging error
- Storage Condition

→ According to ICH guidelines on impurity in a drug substance it defined as any component in new drug substance that is not chemical entity of the drug substance.

① Raw material :- Impurities from raw materials may be carried through manufacturing process and contaminate the final product.  
Ex. Rock salt ( $\text{CaSO}_4 + \text{MgCl}_2$ ) = NaCl.

Rock salt contains small amount of Calcium sulphate and magnesium chloride, Now 'NaCl' prepared from this source may contain calcium and magnesium traces.

② Reagent :-

If the reagent, used in manufacturing are not completely remove by washing, then it may find final product.

Ex.  $\text{HgCl}_2 + 2\text{NH}_4\text{OH} \rightarrow \text{NH}_2\text{HgCl} + \text{NH}_4\text{Cl}$

In above reaction ammoniated chloride prepared contains ammoniated hydroxide,

⑤ Atmosphere contamination :-

In industrial area atmosphere is a contaminated with dust particles are harmful gases during manufacturing products can react with them and get contaminated.  
Ex. NaOH reacts with atmospheric  $\text{CO}_2$  & get contaminated that's why it should not kept open for long time.

That's why most of the industries build in outer areas where pollution is very low.

⑥ Reaction with vessel :-

During manufacturing process source of the used solvents and reagent may undergo reaction with vessel and contaminate the final products.

Ex. Iron vessel contains arsenic as impurity now, inorganic compounds that are manufactured in iron vessel may contain iron and arsenic as impurities.

⑦ Packaging error :-

product of similar appearance such as tablet of the same sample, size and color. Sometimes packed in similar containers lead to potential source of danger. Improper labelling may also cause major packaging error.

Now if IS not remove by washing with water then it may contaminate the final product.

Method :-

There are various method used for manufacturing of pharmaceutical products. In certain drugs a multiple step synthesis process is a used, which produces intermediate compounds.

Now it is very important to purify this intermediate compound otherwise it will contaminate the final product.

Solvent :-

Most of the pharmaceutical products manufactured using water as solvent. Now generally we used distilled or demineralized water, but sometimes for reducing cost we use softened water that contains  $\text{Na}^+$  and  $\text{Cl}^-$  ions as impurity that can contaminate the final product.

Tap water :- Contains  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Na}^+$  etc. as impurity.

Softened water :- Contains  $\text{Na}^+$ ,  $\text{Cl}^-$  as impurity.

Demineralised water :- May contain organic impurity.

Distilled water :- Best but costly.

⑧ Storage Condition :-

After preparation of final products it should be stored in appropriate container depending upon.

- Nature of material.
- Batch size
- Quantity.

Generally materials like plastic, iron, stainless steel and aluminium are used for storage. Improper storage lead to reaction with these materials and contamination to final products.

→ Types of Impurity :-

- ① organic Impurity
- ② inorganic Impurity,
- ③ Residual solvents

① organic impurities :-

① organic impurities basically arise during synthesis, purification and storage of drug substance.



  
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**List of Tutorials (F. Y. B. Pharmacy)**  
**Academic Year 2023-24**  
**BP201T Human Anatomy and Physiology-II**

1. Describe in detail of nephron with neat labelled diagram.
2. Describe in detail of nephron with neat labelled diagram.
3. Write in detail structure and function of brain.
4. Draw a diagram of digestive system and describe phases of digestion.
5. Describe in detail structure and function of liver and stomach.
6. Describe in detail structure and function of lungs.
7. Write in detail note on salivary gland.
8. Describe in detail mechanism of respiration.
9. Draw diagram of urinary system and describe physiology of urine formation.
10. Describe in detail structure and function of kidney.
11. Describe in detail structure and function of nephron.
12. Describe in detail anatomy and physiology of Adrenal gland.
13. Describe in detail Protein synthesis.
14. Describe in detail male and female reproductive system.
15. Detail note on Menstrual cycle and spermatogenesis.



  
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Tutorial No: 1

Q. Describe in detail Neuron with neat labelled diagram.

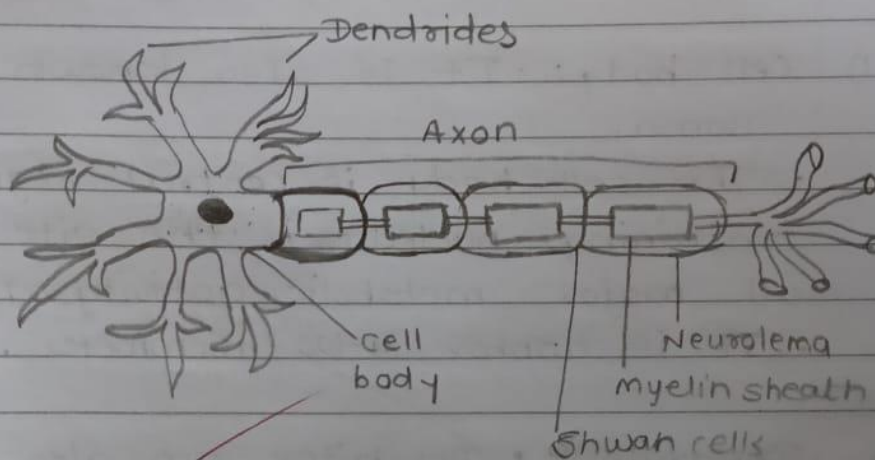


Fig: Neuron

- Neuron is a basic structural and functional unit of nervous system.
- They generate carry and transmit nerve impulse
- It is also known as nerve cells.

Structure of Neuron :-

A basically neuron composed of three parts.





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- ① Cell body
- ② Dendrites
- ③ Axon.

1) Cell body: It is also known as soma.

- The cell body is central region containing nucleus is the site of all major metabolic activity of cell.
- It is approx 4-100 micrometer.

~~2) Dendrites: Dendrites are also the extension of cell body that receives stimulus or nerves impulses from other neurons and sends them to cell body.~~

3) Axon: Axon is a thin, long and cylindrical process / extension that arise from the cell body.

- Axon are the most important part of neuron that carry and transmit impulse from one neuron to other.



  
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### BP202T Pharmaceutical Organic Chemistry I – Theory

Tutorial number	Tutorial Questions	
	A Division (NPP)	B Division (NPP)
1	Explain hybridization. Give a brief idea about sp <sup>3</sup> , sp <sup>2</sup> , and sp hybridization.	Explain hybridization. Give a brief idea about sp <sup>3</sup> , sp <sup>2</sup> , and sp hybridization.
2	Explain E1 and E2 reactions. Factors affecting E1 and E2.	Explain E1 and E2 reactions. Factors affecting E1 and E2.
3	Explain Markovnikov's and anti-Markovnikov's rule.	Explain Markovnikov's and anti-Markovnikov's rule.
4	Write a note on electrophilic addition reaction	Write a note on electrophilic addition reaction
5	Give SN1 and SN2 mechanisms.	Give SN1 and SN2 mechanisms.
6	Give a short note on Aldol condensation and benzoin condensation reaction	Give a short note on Aldol condensation and benzoin condensation reaction
7	Give a short note on the Cannizzaro reaction and Perkin condensation reaction	Give a short note on the Cannizzaro reaction and Perkin condensation reaction
8	Give structure and uses of formaldehyde	Give structure and uses of formaldehyde
9	Explain the acidity of carboxylic acid, and the effect of substituent on it.	Explain the acidity of carboxylic acid, and the effect of substituent on it.
10	Give structure and uses of acetic acid and tartaric acid	Give structure and uses of acetic acid and tartaric acid
11	Give factors affecting SN1 and SN2 mechanism	Give factors affecting SN1 and SN2 mechanism
12	Difference between E1 and E2 mechanism	Difference between E1 and E2 mechanism
13	Difference between SN1 and SN2 reaction	Difference between SN1 and SN2 reaction
14	Give structure and uses of Amphetamine	Give structure and uses of Amphetamine
15	Give brief introduction to aliphatic amine	Give brief introduction to aliphatic amine



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### BP204T Pathophysiology – Theory

Tutorial number	Tutorial Questions	
	A Division (PSB)	B Division (PSB)
1	Differentiate between reversible and irreversible cell injury	Differentiate between reversible and irreversible cell injury
2	Discuss about apoptosis related to its molecular mechanisms	Discuss about apoptosis related to its molecular mechanisms
3	Explain cellular adaptations	Explain cellular adaptations
4	Discuss the mechanism of inflammation in detail	Discuss the mechanism of inflammation in detail
5	Explain the chronic renal failure	Explain the chronic renal failure
6	Discuss the pathophysiology of CCF	Discuss the pathophysiology of CCF
7	Explain the pathophysiology of diabetes	Explain the pathophysiology of diabetes
8	Explain the pathophysiology of epilepsy	Explain the pathophysiology of epilepsy
9	Explain the pathophysiology of hepatitis	Explain the pathophysiology of hepatitis
10	Explain the pathophysiology of cancer	Explain the pathophysiology of cancer
11	Explain the pathophysiology of tuberculosis	Explain the pathophysiology of tuberculosis
12	Explain the pathophysiology of AIDS	Explain the pathophysiology of AIDS
13	Explain the pathophysiology of rheumatoid arthritis	Explain the pathophysiology of rheumatoid arthritis
14	Explain the pathophysiology of peptic ulcer	Explain the pathophysiology of peptic ulcer
15	Explain the wound healing	Explain the wound healing



  
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## List of Tutorials (F. Y. B. Pharmacy)

Academic Year 2023-24

### BP203T Biochemistry – Theory

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



  
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## Tutorial - 1

\* Biomolecules (carbohydrate, lipid, protein).

→ Biomolecules are molecules that occurs naturally inside living organism.

Generally most of the biomolecules contains carbon as major element.

Other than carbon, biomolecules generally contain H, N, O, P, S.

Types of biomolecules

1) carbohydrates.

2) Lipids

3) proteins

4) Nucleic acid.



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i) carbohydrates:

They are most abundant naturally occurring organic compounds in the nature.

They are simply defined as the biomolecules containing carbon hydrogen and oxygen in ratio 1:2:1 they are also known as hydrogen of carbons).

since most of carbohydrates are sweet in taste hence, they are also known as sugar i.e sucrose.

carbohydrates are also called saccharides.

General Formula:  $C_n(H_{2n}O)_n$ .

sugar like ribose deoxybase forms genetic material DNA and RNA.



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3) Lipids:

The word lipid is derived from greek word 'lipos' which means fat.

Lipids can be defined as organic substances that are reactively insoluble in water and soluble in organic solvents such as ether, chloroform or benzene.

They are hydrophobic in nature unlike proteins, nucleic acid carbohydrates. Lipids are not polymer.

example: Fats and oils.

cell membrane or plasma membrane is made up of lipids.

They are precursors of hormones (e.g. Testosterone, progesterone, estrogen).







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- 3) proteins :
- proteins are most abundant organic molecules in living system.
  - They constitute about 50% of dry cellular weight.
  - They are essential for the structure function regulation of body's tissue and organs.
  - proteins are made up of smaller unit called Amino acid.

AEW  
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