ST. JAMES COLLEGE OF PHARMACEUTICAL SCIENCES
ST. JAMES MEDICAL ACADEMY
RIVER BANK, CHALAKUDY

PROGRAMME:	B. PHARM	SEM.:	FIRST
NAME OF COURSE: (*SUBJECT*)	PHARMACEUTICAL INORGANIC CHEMISTRY	COURSE CODE:	BP104T
TEACHING FACULTY OF THE COURSE	SILVIPRIYA K S, MS. JISMY FRANCIS		

SUMMARY OF THE LECTURE PLAN

TOPIC	LECTURES	HOURS
IMPURITIES IN PHARMACEUTICAL SUBSTANCES	History of pharmacopoeia	1
	Sources and types of impurities	1
	Introduction to limit test	1
	Limit test for chloride, sulphates, iron, lead, heavy metals, arsenic and modified limit tests.	3
ACIDS, BASES AND BUFFERS	Introduction to acids, bases and buffers.	1
	Buffer equation, buffer capacity & buffers in pharmaceutical systems	3
	Buffered isotonic solutions	1
	Measurement of tonicity	1
	Calculations and methods of adjusting isotonicity.	1
MAJOR EXTRA AND INTRACELLULAR ELECTROLYTES	Functions of major physiological ions	1
	Electrolytes used in the replacement therapy: sodium chloride*, potassium chloride, calcium gluconate*	4
	Oral rehydration salt (ORS), physiological acid base balance.	2
DENTAL PRODUCTS	Dentifrices, role of fluoride in the treatment of dental caries, desensitizing agents, calcium carbonate, sodium fluoride, and zinc eugenol cement.	3
GASTROINTESTINAL AGENTS:	**Acidifiers**: ammonium chloride* and dil. HCl	1
	Antacid: ideal properties of antacids, combinations of antacids, sodium Bicarbonate*, aluminum hydroxide gel, magnesium hydroxide mixture	3

	Cathartics: magnesium sulphate, sodium orthophosphate, pharmaceutical aid kaolin and bentonite	2
	Antimicrobials: mechanism, classification, potassium permanganate, boric acid, hydrogen peroxide*, chlorinated lime*, iodine and its preparations	3
MISCELLANEOUS COMPOUNDS	**Expectorants**: potassium iodide, ammonium chloride	1
	Emetics: copper sulphate*, antimony potassium Tartrate	1
	Haematinics: ferrous sulphate*, ferrous gluconate	1
	Poison and antidote: sodium thiosulphate*, activated charcoal, sodium nitrite333	1
	Astringents: zinc sulphate, potash alum	1
RADIOPHARMACEUTICALS	Radio activity, measurement of radioactivity	3
	Properties of α, β, γ radiations, half life, radio isotopes	2
	Study of radio isotopes - sodium iodide 131, storage conditions, precautions & pharmaceutical application of radioactive substances.	3

MAJOR ISSUES OR CORE ASPECTS TO BE ADDRESSED/ COVERED:

TOPIC TITLE
IMPURITIES IN PHARMACEUTICAL SUBSTANCES
Introduction to Pharmacopoeia.
Impurities in Pharmaceutical substances : Its Sources and types.
Different tests for impurity detection in Pharmaceutical substances especially limit tests.
Principle and procedure involved in the limit test for Chloride, Sulphate, Iron, Arsenic, Lead and Heavy metals. Modified limit test for Chloride and Sulphate.
TOPIC TITLE
ACIDS, BASES AND BUFFERS
Introduction to the concepts of acids, bases and buffers.
Various Buffers available in pharmaceutical systems.
Preparation and stability determination of buffered isotonic solutions
Measurements of tonicity, calculations and methods of adjusting isotonicity.
TOPIC TITLE
MAJOR EXTRA AND INTRACELLULAR ELECTROLYTES
Role and functions of major physiological ions of human body.
Electrolytes used in the replacement therapy especially Sodium chloride, Potassium chloride & Calcium gluconate.
Oral Rehydration Salt (ORS) its composition and reconstitution.
Importance of Physiological acid base balance.

TOPIC TITLE
Dental products
Role of Dentifrices and its composition.
Dental caries and role of Fluorides and phosphates in the treatment of dental caries.
Desensitizing agents and different drugs used as dental products: Calcium carbonate, Sodium fluoride and Zinc eugenol cement.
TOPIC TITLE
GASTROINTESTINAL AGENTS
Acidifiers: Definition, mechanism of action, classification and examples of inorganic compounds used as acidifiers such as Ammonium chloride and Dil. HCl
Antacid: Ideal properties of antacids, combinations of antacids, Definition, mechanism of action, classification and examples of inorganic compounds used as antacids such as Sodium Bicarbonate*, Aluminum hydroxide gel, Magnesium hydroxide mixture
Cathartics: Definition, mechanism of action, classification and examples of inorganic compounds used as Cathartics such as Magnesium sulphate, Sodium orthophosphate, Pharmaceutical Aid Kaolin and Bentonite
Antimicrobials: Mechanism, classification and examples of inorganic compounds used as antimicrobials such as Potassium permanganate, Boric acid, Hydrogen peroxide, Chlorinated lime, Iodine and its preparations
TOPIC TITLE
MISCELLANEOUS COMPOUNDS
Expectorants: Definition, mechanism of action, classification and examples of inorganic compounds used as Expectorants such as Potassium iodide, Ammonium chloride
Emetics: Definition, mechanism of action, classification and examples of inorganic compounds used as Emetics such as Copper sulphate*, Antimony potassium tartarate
Haematinics: Definition, mechanism of action, classification and examples of inorganic compounds used as Haematinics such as Ferrous sulphate*, Ferrous gluconate
Poison and Antidote: Definition, mechanism of action, classification and examples of inorganic compounds used as Poison and Antidote such as Sodium thiosulphate*, Activated charcoal, Sodium nitrite333
Astringents: Definition, mechanism of action, classification and examples of inorganic compounds used as Astringents such as Zinc Sulphate, Potash Alum
TOPIC TITLE
RADIOPHARMACEUTICALS
Introduction to radio activity.
Properties of α, β, γ radiations, Introduction to terms like half life, radio isotopes..
Study of radio isotopes - Sodium iodide 131
Storage conditions, precautions & pharmaceutical application of radioactive substances.
Different methods for measurement of radioactivity

SAMPLE QUESTIONS

TOPIC TITLE
IMPURITIES IN PHARMACEUTICAL SUBSTANCES
Write the principle for lead limit test with reactions.
What is radioactivity? Explain a method for the measurement of radioactivity.
Limit test for Arsenic is based on modified _____
Write the sources of impurities in synthetic drugs?
Discuss the principle of limit test of Iron.
Describe the principle, process and apparatus used in limit test of Arsenic.
Define Limit test. Explain the principle procedure and apparatus involved in the limit test of Arsenic and sulphate with neat diagram.
Give the principle of limit test for heavy metals.
Explain the monograph of IP.
Write a note on sources and types of impurities in drugs and pharmaceuticals.
How do the method or process employed in the manufacture of a pharmaceutical affect the impurity profile. Explain with examples.
Define limit test. Explain the principle procedure and apparatus involved in the limit test of arsenic and sulphate with neat diagram.
TOPIC TITLE
ACIDS, BASES AND BUFFERS
Define buffer capacity.
Note on physiological buffers.
Methods for measurements of tonicity.
Methods of adjusting isotonicity.
TOPIC TITLE
MAJOR EXTRA AND INTRACELLULAR ELECTROLYTES
Write the physiological role of zinc.
Write a note on oral rehydration salt. Give the composition of Oral Rehydration Solution as per WHO norms. Justify its use.
Describe the concept of acid-base balance in the body.
Explain about physiological acid-base balance.
What is electrolyte combination therapy. How do you prepare calcium gluconate.
Give a note on calcium and potassium compounds used as electrolyte replenishers.
List the ions present in ORS. Explain the contents and role of each ion. Where is it useful?
What is normal saline solution. How will you prepare it.
The official compounds of iron
TOPIC TITLE

DENTAL PRODUCTS
What are dental products? Write about the role of fluorides as ant-caries agents.
Define dentifrices. Classify dental products with one example each.
List the calcium compounds used as dentifrice.
Dental cement and fillers with example.
TOPIC TITLE
GASTROINTESTINAL AGENTS
Define Topical agents. Classify them with examples. Write about the different solutions of Iodine.
What are saline cathartics? Write the preparation and assay of magnesium sulphate.
How will you assay ammonium chloride?
Define an antacid. Write the preparation and assay of sodium bicarbonate.
What are expectorants. Give the methods of preparation and identification test of Ammonium Chloride?
What are cathartics. Classify them and give examples. Give the justification for combination antacid therapy?
Classify gastro-intestinal agents and give examples?
Write a note on acid neutralizing capacity of antacids.
Write the principle of assay of Chlorinated Lime.
Write notes on the method of preparation, assay and uses of aluminium hydroxide gel.
What is bentonite. Explain its properties, procedure for test for purity and uses.
Classify antimicrobials. Explain the preparation and assay of hydrogen peroxide and bleaching powder.
Exemplify the mechanism of action of inorganic antimicrobials.
Explain iodine and its preparations.
Classify gastrointestinal agents giving examples. Explain the mechanism of action of each class and its medicinal uses.
Explain the principle of assay of Boric acid.
TOPIC TITLE
MISCELLANEOUS COMPOUNDS
Write a note on poison antidotes.
Classify topical agents with examples.
Define emetics. Explain the properties, assay and uses of copper sulphate.
Give the properties and uses of sodium nitrite and zinc sulphate.
What are haematinics. Explain the preparation, assay and uses of ferrous sulphate.
Define antidote. Give its classification with examples. Brief on the mechanism of action of any one antidote.

TOPIC TITLE
RADIOPHARMACEUTICALS
Discuss the hazards of radio-pharmaceuticals.
Describe the measurement of radioactivity. What are the standards and units of radioactivity?
Explain the properties of Alpha, Beta and Gamma Rays. Explain the various methods employed for the measurement of radioactivity.
Define radioactivity. Explain the properties of alpha, beta and gamma rays and explain the preparation, properties, storage and medicinal uses of sodium iodide 131.
Explain diagrammatically the different methods used for measurement of radioactivity.
Define isotope and radioactivity. Explain the working of GM counter with neat and labelled diagram. Discuss in detail the applications of radioisotopes in the diagnosis and treatment of diseases.
Explain the properties of alpha, beta and gamma rays. Explain the various methods employed for the measurement of radio activity.
Define radio opaque contrast medium. Mention examples.

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RIVER BANK
CHALAKUDY
680 307

Dr.K. KRISHNAKUMAR Bsc., M.Pharm., Ph.D
Principal
St. James College of Pharmaceutical Sciences
St. James Medical Academy, GH Road
River Bank, Chalakudy - 680 307