

St.James College of Pharmaceutical Sciences St.James medical Academy River Bank, Chalakudy			
Programme:	B.PHARM	Sem.:	III
Name of Course: (Subject)	PHARMACEUTICAL MICROBIOLOGY	Course Code:	BP 303 T
Teaching faculty of the course	Mrs.KAVITHA V B		

Summary of the Lecture Plan

Topic	Lectures	Hours
Introduction	history of microbiology, its branches,	1
	scope and its importance. Introduction to Prokaryotes and Eukaryotes	1
Study of bacteria	Study of ultra-structure and morphological classification of bacteria	2
	nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve,	1
	isolation and preservation methods for pure cultures,	1
	cultivation of anaerobes	1
	quantitative measurement of bacterial growth (total & viable count)	1
Microscopy	phase contrast microscopy, dark field microscopy	1
	electron microscopy.	1
Identification of bacteria	staining techniques (simple, Gram's & Acid fast staining)	2
	biochemical tests (IMViC).	1
Sterilization.	principle, procedure, merits, demerits and applications of Physicalsterilization.	2
	principle, procedure, merits, demerits and applications ofchemicalsterilization.	2
	principle, procedure, merits, demerits and applications ofmechanicalsterilization.	2
Fungi and virus.	morphology, classification, reproduction/replicationand cultivation of Fungi.	2
	morphology,classification, reproduction/replicationand cultivation ofVirus.	2
Disinfectants	Classification and mode of action of disinfectants	1

	Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions	2
	Evaluation of bactericidal & Bacteriostatic	1
Sterility testing	testing of products -solids, liquids according to IP.	1
	testing of products ophthalmic and other sterile products according to IP.	1
Aseptic area	Designing of aseptic area	1
	laminar flow equipments; study of different sources of contamination in an aseptic area	1
	methods of prevention, clean area classification	1
	Principles and methods of different microbiological assay	1
	Methods for standardization of antibiotics	1
	Methods for standardization of vitamins	1
	Methods for standardization of amino acids.	1
	Assessment of a new antibiotic.	1
Spoilage	factors affecting the microbial spoilage of pharmaceutical products,	1
	sources and types of microbial contaminants	1
	assessment of microbial contamination and spoilage	1
Preservation of pharmaceutical products	Preservation of pharmaceutical products using antimicrobial agents	1
	evaluation of microbial stability of formulations.	1
Animal cells in culture	general procedure for cell culture, Primary, established and transformed cell cultures.	1
	Application of cell cultures in pharmaceutical industry and research	1

Major issues or Core aspects to be addressed/ covered:

Introduction
history of microbiology, its branches,
scope and its importance. Introduction to Prokaryotes and Eukaryotes
Microscopy
Principle, procedure and applications of phase contrast microscopy, dark field microscopy
electron microscopy.
Internal and external structures to the cell wall,
isolation techniques – streak plate method ,pour plate method, spread plate method, micromanipulator method, roll tube method,
nutritional requirements – macro and micro nutrients,
culture media – agar, water, carbon source, energy source, yeas extract, meat extract
Bacterial growth curve – lag phase, log phase, stationary phase, death /decline phase
cultivation of anaerobes – anaerobic method, McIntosh fields anaerobic jar method, glove box method, gaspak method, thoiglycolate broth method, alkaline pyrogallol method
Identification techniques - staining techniques and biochemical test
Sterilization.
principle, procedure, merits, demerits and applications of Physical sterilization.
principle, procedure, merits, demerits and applications of chemical sterilization.
principle, procedure, merits, demerits and applications of mechanical sterilization
Fungi and virus.
Morphology – Structure of virus
reproduction/replication - adsorption, penetration, uncoating , biosynthesis, virion assembly, release
cultivation of Fungi- Animal inoculation, Embryonated egg, tissue culture method
Disinfectants
Classification and mode of action of disinfectants
Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions
Evaluation of bactericidal & Bacteriostatic
Sterility testing
testing of products -solids, liquid saccording to IP.
testing of products ophthalmic and other sterile products according to IP.
Aseptic area
Designing of aseptic area
laminar flow equipments; study of different sources of contamination in an aseptic area
methods of prevention, clean area classification
Principles and methods of different microbiological assay
Methods for standardization of vitamins

Methods for standardization of amino acids.
Assessment of a new antibiotic.
Preservation of pharmaceutical products
Preservation of pharmaceutical products using antimicrobial agents
Evaluation of microbial stability of formulations.
Animal cells in culture
general procedure for cell culture, Primary, established and transformed cell cultures.
Application of cell cultures in pharmaceutical industry and research

Sample Questions

INTRODUCTION
History and scope of microbiology
Difference between prokaryotes and eukaryotes
MICROSCOPY
Principle of Dark field microscopy.
Working and application of electron microscopy
BACTERIA
Phases of normal growth curve of typical bacterium.
Raw materials used for bacterial culture media
Nutritional requirements of bacteria
Difference between viable count and total count.
Types of flagella.
List out physical parameters for the growth of bacteria
Isolation techniques for the bacteria.
Staining techniques used for the identification of bacteria.
IMViC test for bacteria
STERILISATION
Principle, procedure, merits and demerits of moist heat sterilization
Evaluation of various sterilization methods
Note on sterilization by dry heat
FUNGI AND VIRUS
Cultivation of virus
Reproduction of fungi
What is capsid

STERILITY TESTING
Sterility testing of pharmaceutical products
Note on membrane filtration technique
DISINFECTION
Determination of chick martin coefficient
Give mode of action of any two-disinfectant compound
Ditch plate method
Phenol coefficient method
ASEPTIC AREA
Design of aseptic area
Laminar air flow
Sources of contamination and preventive methods
SPOILAGE
Types of spoilage
assessment of microbial contamination
Factors affecting microbial spoilage.
PRESERVATION OF PHARMACEUTICAL PRODUCTS
Various preservation techniques for the pharmaceutical products.
Evaluation of microbial stability of formulation.
Name the factors which affect the efficacy of preservatives
ANIMAL CELLS IN CULTURE
Application of cell cultures in Pharmaceutical industry
General procedure for the cell culture