

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

(LO 2035)

MARCH 2019

Sub. Code: 2035

B.PHARM. DEGREE EXAMINATION
PCI Regulation – SEMESTER III
PAPER III – PHARMACEUTICAL MICROBIOLOGY

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Discuss various preservation methods of Pure culture.
2. Give a detailed note on cultivation of Viruses in laboratory.
3. Explain the types of Laminar air flow equipment and its operating principles with suitable diagram.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Explain briefly about the structures internal to bacterial cell wall with diagram.
2. Write the principle and procedure of Gram staining method.
3. Indole production test.
4. Write a note on Radiation sterilization.
5. Classification of Fungi.
6. Explain briefly about the various factors influencing disinfectant action.
7. What is Minimum Inhibitory Concentration? Explain the assay of Antibiotics by Turbidimetric method.
8. Write a note on various sources and types of Microbial contaminants.
9. Application of Primary cell culture.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Tyndallization.
2. Classification of bacteria based on temperature.
3. Use of culture media.
4. Principle of Acid fast staining method.
5. Dry heat sterilization.
6. What is Chick-Martin test?
7. Distinguish Antiseptics and Disinfectants.
8. Give the principle of Microbial assay.
9. Any two factors affecting Microbial spoilage.
10. Transformed cell culture.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

(LP 2035)

SEPTEMBER 2019

Sub. Code: 2035

B.PHARM. DEGREE EXAMINATION
PCI Regulation – SEMESTER III
SECOND YEAR
PAPER III – PHARMACEUTICAL MICROBIOLOGY

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Explain how microscopic methods (staining techniques) help in the identification of micro-organism.
2. Explain the different factors affecting the microbial spoilage of pharmaceutical products.
3. Explain the importance of sterilization indicators used for the evaluation of the efficiency of sterilization methods.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Explain the classification of disinfectant.
2. Scope and application of Microbiology.
3. State the methods of preservation of microbial cultures.
4. Microbial assay of Antibiotics.
5. Explain about moist heat sterilization.
6. Write on sterility test of pharmaceutical products.
7. Define Phenol coefficient test. Explain Chick Martin's test.
8. Classify micro-organisms depending on temperature with examples.
9. Explain the principle, procedure and interpretation of Voge-Proskauer test.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. List the functions of bacterial capsule.
2. Mycolic acid.
3. Unique property of agar as a solidifying agent.
4. Sex pili.
5. Growth curve.
6. Add a note on distribution pattern of flagella.
7. Define sanitizers and Antiseptic.
8. Membrane filter.
9. Give two examples each of fungicidal and virucidal agents.
10. Primary cell culture.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LR 0121]

JANUARY 2021

Sub. Code: 2035

(MARCH 2020 EXAM SESSION)

B. PHARMACY DEGREE EXAMINATION

PCI REGULATION – SEMESTER III

PAPER III – PHARMACEUTICAL MICROBIOLOGY

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions.

(2 x 10 = 20)

1. Define Sterilization and explain in detail about Sterilization by Radiation and Chemical agents.
2. Discuss Microbiological assay of Antibiotics.
3. Explain the evaluation of Disinfectants.

II. Write notes on: Answer any SEVEN questions.

(7 x 5 = 35)

1. Describe the nutritional requirements and physical conditions required for Bacterial growth.
2. Explain viable count of Bacteria.
3. Explain about the Lytic cycle.
4. Explain in detail about the factors influencing disinfection action.
5. Discuss the different sources of contamination in an Aseptic area.
6. Explain in detail about media used for Animal cell culture.
7. Explain the types of Microbial spoilage.
8. Describe the Gram staining technique with examples.
9. Explain about Sterility indicators.

III. Short answers on: Answer ALL questions.

(10 x 2 = 20)

1. Define Generation time with examples.
2. What is Fumigation?
3. Define Bacteriophage.
4. Give examples for Acid-fast bacteria.
5. Laminar Air Flow.
6. What are the media used for Sterility test?
7. Classify Bacteria based on flagella arrangements.
8. Define Cell line with examples.
9. Give examples of preservatives used for the preparation of pharmaceutical products.
10. What is moist heat sterilization?

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[BPHARM 0921]

**SEPTEMBER 2021
(SEPTEMBER 2020 EXAM SESSION)**

Sub. Code: 2035

**B.PHARM. DEGREE EXAMINATION
PCI Regulation 2017 – SEMESTER III
PAPER III - PHARMACEUTICAL MICROBIOLOGY
*Q.P. Code: 562035***

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. What is Differential staining? Explain in detail about the Acid fast staining method.
2. Define Disinfectants. Classify them and give a descriptive note on mode of action of disinfectants.
3. What is Spoilage? Write down the various factors affecting the spoilage of Pharmaceutical products.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Explain the morphological classification of Bacteria with suitable diagram.
2. Explain briefly about the nutritional requirements of Bacteria.
3. Cultivation method of Anaerobes.
4. Methyl Red test.
5. Write a note on Moist heat sterilization method.
6. Explain Phenol coefficient test?
7. Explain briefly about the different sources of contamination in an Aseptic area.
8. Assay of Antibiotics by cup plate or cylinder plate method.
9. Give the applications of cell cultures in Pharmaceutical industry and Research.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Prokaryotes.
2. Functions of Pili.
3. Endospores.
4. Generation time.
5. Physical Indicators.
6. Disinfectant.
7. List some sterile Pharmaceutical products.
8. What is Sterility test?
9. Give any two importance of Aseptic technique.
10. Classification of Clean area.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[BPHARM 0122]

**JANUARY 2022
(MARCH 2021 EXAM SESSION)**

Sub. Code: 2035

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)

PCI Regulation 2017 – SEMESTER III

PAPER III - PHARMACEUTICAL MICROBIOLOGY

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Draw and describe the structure of Bacteria and give the function of each part.
2. Define Disinfectant. Describe factors affecting the choice of Disinfectant.
3. What are different methods of Sterilization? Explain in detail about filtration sterilization and give its applications.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Differentiate between Gram +ve and Gram –ve bacterial cell.
2. Explain the principles and method of Microbiological assay of Antibiotics.
3. Explain the Bacterial growth curve with a neat diagram.
4. What are enriched, selective, and differential media? Give example for each.
5. Sources of contamination in Aseptic area.
6. Designing of Aseptic area.
7. Preservation of pharmaceutical products.
8. Electron microscopy.
9. Write the preservation methods of pure Culture.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Differentiate between Slime layer and Capsule.
2. Write the significance of Flagella.
3. Rideal-Walker test.
4. Sporulation.
5. State the reason for using cedar wood oil under 100x objective.
6. D-Value.
7. Acid fast stain.
8. Pasteurization.
9. Bacteriophage.
10. Biological indicators.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[BPHARM 0522]

**MAY 2022
(SEPTEMBER 2021 EXAM SESSION)**

Sub. Code: 2035

**B.PHARM. DEGREE EXAMINATION
PCI Regulation 2017 – SEMESTER III
PAPER III - PHARMACEUTICAL MICROBIOLOGY
Q.P. Code: 562035**

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Define sterilization. Explain physical method of sterilization.
2. What is a disinfectant? Evaluation of bacteriostatic disinfectants.
3. Draw and describe the Morphology of Bacteria and give the function of each part of Bacteria

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Electron microscopy
2. Types of spoilage
3. Principle of gram staining technique
4. Sterilization by Filtration
5. IMViC test
6. Bacterial Growth curve
7. Isolation of pure culture technique
8. Sterility indicators
9. Life cycle of virus

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Spore
2. Contamination
3. Flagella
4. Fumigation
5. Physical indicators
6. Grams staining
7. Virus
8. Viable count
9. Fungi
10. Biological indicators.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[BPHARM 1022]

**OCTOBER 2022
(MARCH 2022 EXAM SESSION)**

Sub. Code: 2035

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)

PCI Regulation 2017 – SEMESTER III

PAPER III - PHARMACEUTICAL MICROBIOLOGY

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions.

(2 x 10 = 20)

1. Explain briefly Morphology and reproduction of fungi with labeled diagram.
2. Discuss about Rideal walker coefficient test
3. Write in detail about Microbial assay of antibiotics.

II. Write notes on: Answer any SEVEN questions.

(7 x 5 = 35)

1. Principle and working of Laminar air flow cabinet.
2. Factors affecting disinfectants.
3. Grams Staining technique.
4. Morphological classification of bacteria.
5. Bacterial growth curve.
6. How to find Minimum inhibitory concentration?
7. Microbial Stability of formulations.
8. Microbial contamination and spoilage.
9. Applications cell culture in research.

III. Short answers on: Answer ALL questions.

(10 x 2 = 20)

1. Define virus.
2. Define sterilization.
3. Total and viable count.
4. Flagella.
5. Plasmid.
6. Extinction time.
7. Aseptic area.
8. Cell culture.
9. Anaerobes.
10. Examples of disinfectants.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 0323]

**MARCH 2023
(SEPTEMBER 2022 EXAM SESSION)**

Sub. Code: 2035

**B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 – SEMESTER III
PAPER III - PHARMACEUTICAL MICROBIOLOGY**

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Write briefly on Life cycle of Virus with neat diagram.
2. Explain the Evaluation of efficiency of sterilization methods.
3. Discuss Bacteriocidal evaluation of disinfectants.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Radiation sterilization.
2. Merits and demerits of physical method of sterilization.
3. Bacterial growth curve.
4. Viable count methods.
5. Morphological classification bacteria.
6. Acid fast staining technique.
7. Differentiate prokaryotes and eukaryotes.
8. Raw materials for culture media.
9. Reproduction of fungi.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Degermination.
2. Decontamination.
3. Antiseptics.
4. MIC.
5. Aseptic area.
6. IMViC test.
7. Sanitation.
8. Spoilage.
9. Bacteriostatic disinfectants.
10. Cell culture.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 0823]

**AUGUST 2023
(MARCH 2023 EXAM SESSION)**

Sub. Code: 2035

**B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 – SEMESTER III
PAPER III - PHARMACEUTICAL MICROBIOLOGY**

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions.

(2 x 10 = 20)

1. Write about a) Gaseous Sterilisation b) Radiation sterilisation.
2. Write in detail about the various types of culture media used for the growth of bacteria and any four methods for isolation of bacterial pure culture.
3. Write about a) Reproduction of molds b) Cultivation of virus.

II. Write notes on: Answer any SEVEN questions.

(7 x 5 = 35)

1. Industrial autoclave.
2. Acid fast staining.
3. Total counting techniques for bacteria.
4. Sterility testing of Pharmaceuticals.
5. Microbiological assay of vitamins.
6. Discuss about the structures present outside the bacterial cell wall.
7. Various types of laminar air flow equipments.
8. Factors influencing disinfectant ability.
9. Sources of contamination in Pharmaceuticals.

III. Short answers on: Answer ALL questions.

(10 x 2 = 20)

1. Chemoorganotroph.
2. Classify bacteria according to requirement of oxygen.
3. Differentiate Gram positive and gram negative bacteria based on cell wall.
4. Application of Cell culture in the preparation of Pharmaceuticals.
5. Synchronous growth in bacteria.
6. Discuss about the filters used for sterilisation.
7. Lytic cycle vs Lysogenic cycle.
8. Biological indicators.
9. Biochemical reactions used to identify bacteria.
10. Differentiate Antiseptic and disinfectant.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 1223]

**DECEMBER 2023
(SEPTEMBER 2023 EXAM SESSION)**

Sub. Code: 2035

**B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 – SEMESTER III
PAPER III - PHARMACEUTICAL MICROBIOLOGY**

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Write in detail about the methods of reproduction and growth curve of bacteria.
2. Write in detail about the official methods of microbiological assay of antibiotics.
3. Write about the Bacteriostatic and Bactericidal evaluation of disinfectants.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Gaseous Sterilisation.
2. IMVic reaction.
3. Gram staining.
4. Sources of Microbial contamination.
5. Discuss about Phase contrast microscopy and Electron microscopy.
6. Preservation methods for Bacterial Pure cultures.
7. Radiation sterilisation.
8. Design of aseptic area.
9. Enumerate the differences between Prokaryotes and Eukaryotes.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Tyndallisation.
2. Classify bacteria according to presence of flagella.
3. Selective and differential media.
4. Established Cell culture.
5. Any two methods for isolation of bacterial pure cultures.
6. Name the microorganisms used for the assay of Vitamin B₁₂ and Niacin.
7. Name one acid fast bacteria and one gram positive bacteria.
8. Methods of replication of virus.
9. Define Capsid.
10. Bacteriophage.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 0524]

MAY 2024

Sub. Code: 2035

B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)

PCI Regulation 2017 – SEMESTER III

PAPER III - PHARMACEUTICAL MICROBIOLOGY

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions.

(2 x 10 = 20)

1. Write in detail about the morphology and Ultra structure of bacteria.
2. Define and classify Sterilisation. Explain the design and operation of industrial autoclave.
3. Explain the different factors affecting the microbial spoilage of pharmaceutical products.

II. Write notes on: Answer any SEVEN questions.

(7 x 5 = 35)

1. Types and mode of action of disinfectants.
2. Various types of culture media.
3. Sterility testing.
4. Cultivation of Virus.
5. Microbiological assay of antibiotics.
6. Reproduction of molds.
7. Discuss about various types of microscopy.
8. Viable counting techniques of bacteria.
9. Application of cell cultures in pharmaceutical industry.

III. Short answers on: Answer ALL questions.

(10 x 2 = 20)

1. Differentiate Prokaryote Vs Eukaryote.
2. Define and give examples for sterilisation indicators.
3. Name the sources and types of microbial contaminants.
4. Define Primary Cell culture.
5. Formula for calculation of Rideal walker coefficient.
6. Classify micro-organisms depending on optimal growth temperature.
7. Define and differentiate Bacteriostatic and Bactericidal.
8. HEPA Filter.
9. Name the specific micro organisms to be detected in Pharmaceutical test samples as per Pharmacopoeia.
10. Pasteruisation.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 1024]

**OCTOBER 2024
(SEPTEMBER 2024 EXAM SESSION)**

Sub. Code: 2035

**B. PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 – SEMESTER III
PAPER III - PHARMACEUTICAL MICROBIOLOGY**

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Explain the types of laminar air flow equipment and its operating principle with suitable diagram.
2. Define bacteria. Draw and describe the structure of bacteria, functions of each part.
3. Define spoilage. Describe the factors of affecting spoilage of Pharmaceutical products.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Write the principle and procedure for Acid fast staining technique.
2. Factors affecting microbial spoilage.
3. Dark field microscopy.
4. Discuss about bactericidal evaluation.
5. Preservation of Pharmaceutical products.
6. Radiation sterilization.
7. Cultivation methods of anaerobes.
8. Explain about lytic cycle.
9. Explain chick martin test and phenol co-efficient test.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Mesosomes.
2. Define culture medium with example.
3. Simple staining principle.
4. Membrane filter.
5. Prokaryotes.
6. Cell culture.
7. Example for sterile pharmaceutical products.
8. Capsid, capsomers.
9. Virus.
10. Applications of cell Culture.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 0325]

MARCH 2025

Sub. Code: 2035

B. PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)

PCI Regulation 2017 – SEMESTER III

PAPER III - PHARMACEUTICAL MICROBIOLOGY

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions.

(2 x 10 = 20)

1. Discuss various Ultrastructure of bacterial cell external to cytoplasmic membrane and functions of each part.
2. Give a detailed note on various methods of Thermal sterilization.
3. Define microbial spoilage and discuss the various factors affecting the microbial spoilage.

II. Write notes on: Answer any SEVEN questions.

(7 x 5 = 35)

1. Explain briefly about the morphology and reproduction methods of fungi.
2. Write a note on phase contrast microscope.
3. Discuss on design of Aseptic area.
4. Write a note on gaseous sterilization.
5. Discuss in brief on preservation of pharmaceutical preparation using antimicrobial agents.
6. Explain briefly about the various factors influencing disinfectant action.
7. Define MIC. Explain the assay of Antibiotics by Turbid metric method.
8. Write a note on various sources and types of Microbial contaminants.
9. Discuss established and primary cell culture.

III. Short answers on: Answer ALL questions.

(10 x 2 = 20)

1. Pasteurization.
2. Classification of bacteria based on shape and arrangement.
3. Types and Use of Bacterial culture media.
4. Principle of Acid fast staining method.
5. Low Thermal sterilization.
6. What is Chick-Martin test?
7. Distinguish Antiseptics and Disinfectants.
8. Give the principle of Microbial assay.
9. Methods of preservation of Microorganisms.
10. Applications of animal cell culture.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[B.PHARM 0925]

SEPTEMBER 2025

Sub. Code: 2035

B. PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)

PCI Regulation 2017 – SEMESTER III

PAPER III - PHARMACEUTICAL MICROBIOLOGY

Q.P. Code: 562035

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions.

(2 x 10 = 20)

1. Explain brief note on history of microbiology.
2. Write the methods for isolation of bacterial pure culture.
3. Define and classify sterilization. Write the principle, procedure, merits, demerits and applications of moist heat sterilization.

II. Write notes on: Answer any SEVEN questions.

(7 x 5 = 35)

1. Difference between gram positive and gram negative bacterial cell wall.
2. Measurement of bacterial growth.
3. Microbiological assay of vitamins.
4. Replication of virus.
5. Methods for Microbiological Assay.
6. Designing of aseptic area.
7. Citrate utilization test.
8. Source and types of microbial contamination.
9. Define disinfectant. Factors affecting disinfectants.

III. Short answers on: Answer ALL questions.

(10 x 2 = 20)

1. Chemoheterotroph.
2. Endospore.
3. Tyndallization.
4. Fimbriae.
5. MIC.
6. Physical indicator.
7. Sporulation.
8. Fumigation.
9. Generation time.
10. Enrichment media.
