

## Department of biotechnology

### Important questions

#### 1 YEAR Paper- 2– microbiology and immunology

##### Unit I: Fundamentals of Microbiology

###### ◆ Essay Questions (Any 4)

- 1 Describe the historical development of microbiology and major contributors in detail.
- 2 Explain different types of basic and advanced microscopy with diagrams (Bright field, Dark field, Phase contrast, Fluorescent, SEM, TEM).
- 3 Discuss the general characteristics of bacteria and viruses. Add disease-causing pathogens and symptoms (Mycobacterium, Hepatitis).

###### ◆ Short Questions (Any 5)

- 1 Define microbiology.
- 2 What is phase contrast microscopy?
- 3 Mention two differences between bacteria and viruses.
- 4 Write the characteristics of microalgae.
- 5 What is mycoplasma?
- 6 Give two applications of fungi.
- 7 Name one disease caused by Mycobacterium.

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##### ✓ Unit II: Culture & Identification of Microorganisms

###### ◆ Essay Questions (Any 4)

- 1 Explain methods of sterilization – physical and chemical methods.
- 2 Discuss the bacterial growth curve with phases and graphical representation.
- 3 Describe nutritional types of bacteria and essential nutrients required for growth.
- 4 Write in detail about pure culture techniques and their characteristics.

###### ◆ Short Questions (Any 5)

- 1 Define sterilization.
- 2 Mention two macronutrients and two micronutrients for bacteria.
- 3 What is synchronous culture?
- 4 Define anaerobic bacteria. Give one example.
- 5 What are growth factors?
- 6 Write any one method used for culturing viruses.
- 7 What is batch culture?

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### ✓ Unit III: Basics of Immunology

#### ◆ Essay Questions (Any 4)

- 1 Explain innate and adaptive immunity – types and comparison.
- 2 Describe the structure and functions of primary and secondary immune organs.
- 3 Write notes on immune cells – T cells, B cells, NK cells, macrophages, dendritic cells.

#### ◆ Short Questions (Any 5)

- 1 Define immunity.
- 2 What are epitopes?
- 3 Name two primary immune organs.
- 4 What is a hapten?
- 5 Define macrophages.
- 6 Mention two types of T cells.
- 7 What are adjuvants?

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### \* Unit IV: Humoral & Cell Mediated Immunity

#### ◆ Essay Questions (Any 4)

- 1 Describe structure, types and functions of immunoglobulins with neat diagram.
- 2 Discuss cell-mediated immunity – TCR, Antigen presenting cells, cytokines & TCR-peptide-MHC complex.
- 3 Explain monoclonal antibody (MAbs) production – Hybridoma technology and applications including vaccines.

#### ◆ Short Questions (Any 5)

- 1 Define immunoglobulin.
- 2 What is MHC?
- 3 Give one autoimmune disease example.
- 4 Define hypersensitivity.
- 5 What are APCs?
- 6 Write expanded form of HLA.
- 7 Name one application of monoclonal antibodies.