

M.Sc. (Previous) DEGREE EXAMINATION, DECEMBER 2008.**First Year****Microbiology****Paper I — INTRODUCTION TO MICROORGANISMS****Time : Three hours****Maximum : 100 marks****PART A — (5 × 8 = 40 marks)****Answer any FIVE of the following.****All questions carry equal marks.**

1. Explain the growth of microbiology in the twentieth century.
2. Describe the structure of eukaryotic cell with a neat-labeled diagram.
3. Describe the Numerical taxonomy.
4. Write the general characters of Archaeobacteria.
5. Describe the classification of Viruses.
6. Transmission of Viral diseases.
7. Write on the economic importance of fungi.
8. Classification of fungi.

PART B — (4 × 15 = 60 marks)**Answer all FOUR of the following.****All questions carry equal marks.**

9. (a) Write an overview on the microbial diversity, three-domain system of classification and the discovery of antibiotics.

Or

- (b) Compare the prokaryotic and eukaryotic cell. Add note on the development of Vaccines.

10. (a) Write on the classification and general characters of Cyanobacteria and Mycoplasma.

Or

- (b) Mention the general principles of bacterial taxonomy. Elaborate on the latest classification of Bacteria based on the Bergy's manual of systematic bacteriology.

11. (a) Describe the Ultra structure and replication HIV with illustrations.

Or

- (b) Discuss the morphology and chemistry of viruses.

12. (a) Give an account of classification, structure, reproduction and economic importance of algae.

Or

- (b) Describe the classification, general account of structure, reproduction and significance of protozoa.

(DMB 02)

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Microbiology

Paper II — MICROBIOLOGICAL METHODS

Time : Three hours

Maximum : 100 marks

PART A — (5 × 8 = 40 marks)

Answer any FIVE of the following.

All questions carry equal marks.

1. Fluorescent microscopy.
2. Explain the staining methods of bacteria.
3. Write any two methods of bacterial isolation.
4. Explain the enrichment technique.
5. Experimental animal reservoir method for cultivation of viruses.
6. Describe the principle and uses of GLC in the microbiology.
7. Explain about the SDS-PAGE and isoelectric focusing.
8. Mass spectroscopy.

PART B — (4 × 15 = 60 marks)

Answer all FOUR questions.

All questions carry equal marks.

9. (a) Discuss the purpose and importance of sterilization in microbiology. Elaborate the methods of sterilization.
- Or**
- (b) Describe the composition and preparation of bacteriological media. Explain the importance of media in the culturing of bacteria.
10. (a) Describe the different methods of anaerobic culturing and their advantages.
- Or**
- (b) Discuss the need and necessity for maintenance and preservation of microbial cultures.
11. (a) Describe the general principle of centrifugation and discuss the types of centrifugation used in the biological research with their applications.
- Or**
- (b) Describe the general methods used in the isolation and purification of viruses.
12. (a) Explain the importance and applications of radioactivity detection and measurement.
- Or**
- (b) Write the general principle, construction and applications of UV-Vis spectroscopy.

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Paper III — MICROBIAL PSYCHOLOGY AND BIOCHEMISTRY

Time : Three hours

Maximum : 100 marks

SECTION A — (5 × 8 = 40 marks)

Answer any FIVE of the following.

All questions carry equal marks.

1. Micro nutrients.
2. Continuous cultures.
3. Hydrogen oxidizers.
4. Sulphur oxidizers.
5. Substrate level phosphorylation.
6. ED pathway.
7. Allosteric enzymes.
8. Secondary structure of DNA.

SECTION B — (4 × 15 = 60 marks)

Answer all the FOUR questions.

All questions carry equal marks.

9. (a) Explain the approaches for the measurement of bacterial growth.

Or

- (b) Write on nutritional classification of bacteria with examples.

10. (a) Discuss the pathways of autotrophic CO₂ fixation in prokaryotes.

Or

- (b) Explain the assimilation and dissimilation pathways in methylotrophs.

11. (a) Write the biochemical pathways involved in the formation of bacterial formation products from pyruvate.

Or

- (b) How TCA cycle intermediates are utilized in the biosynthesis of various compounds in microorganisms?

12. (a) List out the coenzymes and discuss their role.

Or

- (b) Explain the structures and functions of different types of RNAs.

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Paper IV — ENVIRONMENTAL AND AGRICULTURAL MICROBIOLOGY

Time : Three hours

Maximum : 100 marks

SECTION A — (5 × 8 = 40 marks)

Answer any FIVE of the following.

All questions carry equal marks.

1. Air sampling.
2. Phytoplankton.
3. Components of soil.
4. Phosphorus transformation in soil.
5. Bioinoculants.
6. Actinorhizal symbiosis.
7. Late blight of potato.
8. Plant quarantine and its roles.

SECTION B — (4 × 15 = 60 marks)

Answer all the FOUR questions.

All questions carry equal marks.

9. (a) Discuss the seasonal and diurnal periodicities of air spora.
- Or**
- (b) Explain the approaches for treatment of water for drinking purpose.
10. (a) Discuss the physical and chemical properties of different types of soils.
- Or**
- (b) Explain the transformation of carbon and nitrogen in the soil.
11. (a) Discuss the factors affecting nodulation in plants.
- Or**
- (b) How different soil microorganisms promote plant growth?
12. (a) Describe the symptoms of plant diseases caused by viruses with examples.

Or

(b) Discuss the conventional and non-conventional approaches for the development of disease resistant crop varieties.
