

S.S. Jain Subodh P.G. College, Jaipur
(Autonomous)

M. Sc. Microbiology Semester I

Assignment Oct. 2024

Paper-I

General Microbiology

Attempt any two questions.

Max Marks: 30

UNIT-I

Q.1 Write a detailed note development in the field of microbiology and emphasise the contributions of pioneers. **(15)**

Q. 2 Write short notes on: (Any two) **(7.5+7.5=15)**

- a. Applications of Microbiology
- b. Louis Pasteur
- c. Abiogenesis v/s Biogenesis

UNIT-II

Q. 3. Explain in detail Whittaker five kingdom classification of microorganism. **(15)**

Q.4. Write notes on: (Any two) **(7.5+7.5=15)**

- a. Taxonomic Rank
- b. 16 S rRNA Sequencing
- c. Nuclie acid hybridization

UNIT-III

Q. 5. Explain general characteristics of prokaryotic microorganism. **(15)**

Q.6. Write notes on: (Any two): **(7.5+7.5=15)**

- a. Cyanobacteria
- b. Bacteria
- c. Viruses

UNIT-IV

Q. 7. Write a note on general characteristics and economic importance of fungi. **(15)**

Q. 8 Write notes on (Any two) **(7.5+7.5=15)**

- a. Penicillium
- b. Saccharomyces
- c. Algae

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Paper-II

Bioinstrumentation and Microbial Techniques

Attempt any two questions

Max Marks: 30

UNIT-I

- Q1. Write a detail note on control of microorganism by physical, chemical and filtration methods. **(15)**
- Q2. Write short note on the following: **(7.5+7.5=15)**
- (a) Types of Culture media
 - (b) Streak Plate Method and Spread plate method

UNIT-II

- Q3. What do you mean by staining? Write detail note on various microbial staining methods in detail. **(15)**
- Q4. Write short note on the following: **(7.5+7.5=15)**
- (a) Molecular Markers RAPD, RFLP and AFLP
 - (b) ELISA and PCR

UNIT-III

- Q5. What do you mean by microscopy? Write detail note on structure and function of (SEM & TEM) Electron microscope. **(15)**
- Q6. Write short note on the following: **(7.5+7.5=15)**
- (a) Types of centrifuge
 - (b) Colorimeter and its applications

UNIT-IV

- Q7 what do you mean by Electrophoresis technique? Write detail note on Electrophoresis and its applications. **(15)**
- Q8. Write short note on the following: **(7.5+7.5=15)**
- (a) HPLC
 - (b) Paper and Thin Layer chromatography

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M. Sc. Microbiology Semester I
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Paper- III
Microbial Biochemistry and Physiology

Attempt any two questions

Max Marks: 30

UNIT-I

Q.1 How are carbohydrate classified. Explain in detail with suitable examples. (15)

Q2. Write note on- (7.5+7.5=15)

- (a.) Group translocation
- (b.) Nutritional categories of microbes

UNIT- II

Q3. What are proteins? Explain various types of protein structure in details. (15)

Q4. Explain how enzyme activity is regulated by various factors. (15)

UNIT- III

Q5. Write note on- (7.5+7.5=15)

- (a) Photosynthetic pigments
- (b) Photosynthetic electron transport system

Q6. What is glycolysis? Write different steps of glycolysis and its significance. (15)

UNIT- IV

Q7. What do you mean by biological nitrogen fixation? Give an account of the role of microbes in nitrogen fixation. (15)

Q8. Write note on- (7.5+7.5=15)

- (a) Physiological group of Chemolithotrophs
- (b) Sporulating bacteria

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Paper-IV

Food and Dairy Microbiology

Attempt any two questions

Max Marks: 30

UNIT-I

Q1. Explain different types of food spoilage. Mention three microorganism each from bacteria, fungi and algae involved in food microbiology. **(15)**

Q2. Write short notes on following: **(7.5+7.5=15)**

- a). Spoilage of vegetables and fruits
- b). Food as a substrate for microorganisms

UNIT-II

Q3. Give a brief description of chemical and naturally occurring antimicrobial preservatives. **(15)**

Q4. Write short notes on following: **(7.5+7.5=15)**

- a). SCP (Single Cell Protein)
- b). Production of Saurkraut

UNIT-III

Q5. Discuss about the microbiology of raw and processed milk in detail. **(15)**

Q6. Write short notes on following: **(7.5+7.5=15)**

- a). Probiotics
- b). Prebiotics
- c). Synbiotics

UNIT-IV

Q7. Write a detailed note on regulatory control of milk and dairy products. **(15)**

Q8. Write short note on following: **(7.5+7.5=15)**

- a). *E coli*
- b). Sources of contamination in milk

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**M. Sc. Microbiology Semester III
Assignment Oct. 2024**

**Paper I
Virology**

Attempt any two questions

Max Marks:30

UNIT-I

- Q1. Explain replication of viruses. (15)
Q2. Write short notes on following: (7.5 x 2=15)
a). Mycoviruses
b). Cultivation of viruses

UNIT-II

- Q3. Describe structure and multiplication cycle of T4 phages . (15)
Q4. Write short notes on following: (7.5 x 2=15)
a). Bacteriophage typing
b). M13 phage

UNIT-III

- Q5. Write a detailed note on classification & disease symptoms of plant viruses. (15)
Q6. Write short notes on following: (7.5 x 2=15)
a). Human viruses
b). Diagnosis and treatment of viruses

UNIT-IV

- Q7. Describe different serological methods of viral diagnosis. (15)
Q8. Write short note on following: (7.5 x 2=15)
a). Plaque and end point method
b). Assay of viruses

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Paper II

Environmental and Agricultural Microbiology

Attempt any two questions

Max Marks:30

UNIT-I

1. Define Biodegradation. Describe microbial degradation of herbicide, pesticide and petroleum products. (15)

OR

2. Write short note on the following: (7.5 x 2=15)

- (a) Microbial degradation of Heavy metals.
- (b) Microbial deterioration of building and cultural heritage.

UNIT -II

3. What are waste water? Describe the different methods of wastewater treatment (15)

OR

4. Write short note on the following: (7.5 x 2=15)

- (a) Sewage and Sludge
- (b) BOD

UNIT -III

5. What is biofertilizers. Describe various bacterial biofertilizers and their applications in agriculture. (15)

OR

6. Write short note on the following: (7.5 x 2=15)

- (a) Commercial production of Biopesticide
- (b) Bacterial insecticide

UNIT -IV

7. Write difference between symptoms, causal organism, disease cycle and disease management of late and early blight of potato. (15)

OR

8. Write short note on the following: (7.5 x 2=15)

- (a) Anthrax and their control
- (b) Post Harvest disease and their control

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M. Sc Microbiology Semester III

Assignment Oct. 2024
Paper III Elective -A
Genetic Engineering

Answer any two questions:

Max Marks:30

UNIT -I

1. Write a detailed note on enzymes used in recombinant DNA technology. **(15)**

OR

2. Write short note on the following: **(7.5 x 2=15)**
(a) Linkers and their application.
(b) Homo-polymer tailing.

UNIT -II

3. Explain screening of genomic library by shot gun approach. **(15)**

OR

4. Write short note on the following: **(7.5 x 2=15)**
(a) Promoters and expression cassettes.
(b) YAC vectors

UNIT -III

5. Write a note on medical and agricultural applications of genetic engineering. **(15)**

OR

6. Write short note on the following: **(7.5 x 2=15)**
(a) Plaque hybridization.
(b) CRISPAR-Cas technology and its application.

UNIT -IV

7. Write a detailed note on Sanger method of DNA sequencing. **(15)**

OR

8. Write short note on the following: **(7.5 x 2=15)**
(a) Polymerase Chain Reaction
(b) DNA microarrays.

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Paper-IV Elective A

Microbes in Sustainable Development

Attempt any two questions

Max Marks:30

UNIT-I

Q1. Write detail note on bio control agents and their mechanism of action on soil borne plant pathogens. List at least ten microbes used as bio control agents against plant pathogens. **(15)**

OR

Q2. Write short note on: **(7.5 x 2=15)**
(a) Diversity of different types of microorganisms in soil.
(b) bio insecticides

UNIT-II

Q3. What do you mean by greenhouse gases? Write detail note on the production and control of nitrous oxide and carbon dioxide gases. **(15)**

OR

Q4. Write short note on the mineralization of the following: **(7.5 x 2=15)**
(a) Humus
(b) Cellulose

UNIT-III

Q5. What do you mean by GM crops? Write detail note on advantages and environmental aspects of GM crops. Give five examples. **(15)**

OR

Q6. Write short note on the following: **(7.5 x 2=15)**
(a) PGPR
(b) Mycorrhizal Biofertilizers

UNIT-IV

Q7. What do you mean by xenobiotic compounds? Write detail note on the role of microbes in the removal of xenobiotics from the contaminated sites. **(15)**

OR

Q8. Write short note on the following: **(7.5 x 2=15)**
(a) Biodiesel Production
(b) Bioremediation