

Master of Science (M.Sc.) Third Semester (C.B.C.S.) (Microbiology) Examination  
ELECTIVE—MICROBIAL DIVERSITY, EVOLUTION AND ECOLOGY (MDEE)—I

## Optional Paper—3

## Paper—III

Time : Three Hours]

[Maximum Marks : 80

**N.B. :— ALL** questions are compulsory and carry equal marks.

1. Discuss the evidences that support the concept of a period of RNA life and why RNA life evolved to modern life. (6) 16

OR

Describe various methods of determining evolutionary relationship. 16

2. Define extremophiles with examples and add a note on heat stable biomolecules. (1) 16

OR

Write notes on :

(a) Energy metabolism in sulfolobales 8

(b) Halophilic archæa. 8

3. (a) Write a note on free living  $N_2$ -fixing bacteria. (3) 8

(b) Describe characteristics of bacteria belonging to phylum planctomyces. 8

OR

Explain various properties and environmental significance of sulphur reducing bacteria. 16

4. Describe the general characteristics of green sulphur bacteria. 16

OR

(a) Describe general characters of Deinococci. (3) 8

(b) Write a note on nitrification by nitrospira bacteria. (3) 8

5. Explain the following in brief : 4

(a) Bacterial speciation 4

(b) Methanogens (1) 4

(c) Ecological significance of cyanobacteria (1) 4

(d) Physiology and habitat of Aquifex.

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Master of Science (M.Sc.) Third Semester (CBCS) (Microbiology) Examination  
ELECTIVE : MICROBIAL DIVERSITY, EVOLUTION AND ECOLOGY (MDEE)—I

Optional Paper—3

Paper—III

Time : Three Hours]

[Maximum Marks : 80

N.B. :— All questions are compulsory and carry equal marks.

1. Give a detailed account on evolution of earth and resulting development of early life forms. 16

OR

✓ Discuss the evidences that support the concept of a period of RNA life and why RNA life evolved to modern life. 16

2. Explain the process of autotrophic fixation of CO<sub>2</sub> in Archaeobacteria. 16

OR

(a) Discuss various heat stable biomolecules. 8

(b) Give the salient features of thermoplasma. 8

3. What are Proteobacteria ? Explain with suitable examples, the diversity of sulphate and sulphur reducing bacteria. 16

OR

✓ Discuss microbial diversity and ecological significance of cyanobacteria. 16

4. Write detailed account on branching Hyperthermophiles. 16

OR

Write note on : 8

(a) Thermotoga and Aquifex 8

(b) Green sulphur bacteria.

5. Write notes on : 4

(a) Chemotaxonomy 4

(b) Desulfolobales 4

(c) Verrucomicrobia 4

(d) Nitrospira.

S.S.E.S. Amt's Science College, Congress Nagar, Nagpur  
Terminal Examination  
M.Sc.II (Microbiology)  
Semester III (Winter 2019)  
Paper III- Microbial Diversity, Evolution And Ecology (MDEE)

Time: 3hrs

Note: All the questions are compulsory and carry equal marks.  
Draw diagrams wherever necessary.

Marks: 100

Q.1. Discuss the evidence that support the concept of a period of RNA life and why RNA life evolved to modern life. 16

OR

Describe various methods of determining evolutionary relationship. 16

Q.2) Define extremophiles with example and add a note on Heat stable biomolecules. 16

OR

Write short notes on:

- a) Energy metabolism in sulfolobales 8
- b) Halophilic archaea 8

Q.3) A) Write a note on free living nitrogen fixing bacteria. 8

B) Write a note on Planctomyces. 8

OR

A) Write a note on verrucomicrobia. 8

B) Write a note on sulphate reducing bacteria. 8

Q.4) Describe Deinococci in detail. 16

OR

Write notes on: 8

A) Nitrification by Nitrospora. 8

B) Green sulphur bacteria.

Q.5) Write notes on: 4

1. Bacterial speciation 4

2. Methanogens 4

3. Cyanobacteria 4

4. Physiology and habitat of aquifex

*Badwaik*  
(Dhanshri Badwaik)

Terminal Examination

M.Sc.II (Microbiology)

Semester III (Winter 2019)

Paper III- Microbial Diversity, Evolution And Ecology (MDEE)

Time: 3hrs

Marks: 100

Note: All the questions are compulsory and carry equal marks.

Draw diagrams wherever necessary.

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Q.1. Discuss the evidence that support the concept of a period of RNA life and why RNA life evolved to modern life. 16

OR

Describe various methods of determining evolutionary relationship. 16

Q.2) Define extremophiles with example and add a note on Heat stable biomolecules. 16

OR

Write short notes on:

a) Energy metabolism in sulfolobales 8

b) Halophilic archaea 8

Q.3) A) Write a note on free living nitrogen fixing bacteria. 8  
B) Write a note on Planctomyces. 8

OR

A) Write a note on verrucomicrobia. 8

B) Write a note on sulphate reducing bacteria. 8

Q.4) Describe Deinococci in detail. 16

OR

Write notes on:

A) Nitrification by Nitrospora. 8

B) Green sulphur bacteria.

Q.5) Write notes on:

1. Bacterial speciation 4

2. Methanogens 4

3. Cyanobacteria 4

4. Physiology and habitat of aquifex 4

Terminal Examination

M.Sc.II (Microbiology)

Semester III (Winter 2019)

Paper III- Microbial Diversity, Evolution And Ecology (MDEE)

Marks: 100

Time: 3hrs

Notes: All the questions are compulsory and carry equal marks.

Draw diagrams wherever necessary.

1. Discuss the evidence that support the concept of a period of RNA life and why RNA life evolved modern life. 16
- OR 16
- Describe various methods of determining evolutionary relationship. 16
- Q.2) Define extremophiles with example and add a note on Heat stable biomolecules. 16
- OR
- Write short notes on: 8
- a) Energy metabolism in sulfobacterales 8
  - b) Halophilic archaea
- Q.3) A) Write a note on free living nitrogen fixing bacteria. 8
- B) Write a note on Planctomyces. 8
- OR 8
- A) Write a note on verrucomicrobia. 8
- B) Write a note on sulphate reducing bacteria.
- Q.4) Describe Deinococci in detail. 16
- OR
- Write notes on: 8
- A) Nitrification by Nitrospora. 8
  - B) Green sulphur bacteria.
- Q.5) Write notes on: 4
- 1. Bacterial speciation 4
  - 2. Methanogens 4
  - 3. Cyanobacteria 4
  - 4. Physiology and habitat of aquifex

*Abdulk*

Master of Science (M.Sc.) Third Semester Choice Based Credit System (CBCS)  
(Microbiology) Examination

ELECTIVE : MICROBIAL DIVERSITY, EVOLUTION AND ECOLOGY (MDEE)-I

Optional Paper-3

Paper-III

Time : Three Hours]

[Maximum Marks : 80

Note :— All questions are compulsory and carry equal marks.

1. Discuss evolution of earth and add a note on origin of early organic compounds. 16  
OR
2. Discuss different characteristics of domain of life. 16  
Define extremophiles with examples and add a note on heat stable biomolecules. 16  
OR
- Write notes on :
  - (a) Energy metabolism in sulfolobales. 8
  - (b) Halophilic archaea. 8
3. Write in detail about free living  $N_2$ -fixing bacteria and its importance. 16  
OR
- Write in detail properties and environmental significance of sulphur reducing bacteria. 16
4. Write notes on :
  - (a) Nitrospira and Deferribacter. 8
  - (b) Green non sulphur bacteria. 8
 OR
  - (a) Thermotoga and Aquifer. 8
  - (b) Green sulphur bacteria. 8
5. Write in brief :
  - (a) Signature sequences 4
  - (b) Nanoarchaeum 4
  - (c) Cyanobacteria 4
  - (d) Deinococci 4

SSES Amaravati's Science College, Nagpur

PRELIMINARY EXAMINATION

WINTER 2023

M.Sc. Semester -III

MICROBIOLOGY

Paper-III ( Microbial Diversity Evolution and Ecology )

Time:- Three Hours

Max Marks- 80

1) All questions are compulsory and carry marks as indicated.

2) Draw diagram wherever necessary.

Q.1 Describe the Methods of determining evolutionary relationship.

16

OR

Explain the characteristics of domains of Life.

16

Q.2 a) Halophilic Archaea.

8

b) Thermoproteales.

8

OR

c) Methanogens

8

d) Heat stable biomolecules and extremophiles

8

Q.3 a) Free living N<sub>2</sub> fixing bacteria.

16

OR

a) Prochlorophytes and cyanobacteria

8

b) Verrucomicrobia.

8

Q.4 a) Green sulphur bacteria.

b)Thermotoga and Aquifex

8

OR

c) Green non – sulphur bacteria

8

d) Cytophaga

8

Q.5 Write a short note on following.

4×4=16

a) Bacterial speciation.

b) Nanoarchaeum

c) Planctomyces

d) Deinococci

Time : Three Hours]

N.B. :—All questions are compulsory and carry equal marks.

1. Describe evolution of earth and the development of early life forms. 16
- OR
- Give a detailed account on Ribosomal RNA Sequencing and phylogenetic probes for determining evolutionary relationship. 16
2. Explain extremophiles and heat stable biomolecules. 16
- OR
- (a) Give the salient features of thermoplasma. 8
- (b) Write in brief about desulfolabales. 8
3. Discuss in detail properties and diversity of cyanobacteria. 16
- OR
- What are proteobacteria ? Explain with suitable examples, the diversity of sulphate and sulphur reducing bacteria. 16
4. Give comparative account of green sulphur and green non-sulphur bacteria with suitable examples. 16
- OR
- Write notes on : 8
- (a) Thermotoga and Aquifex 8
- (b) Deferribacter. . . . .
5. Write notes on : 4
- (a) Chemotaxonomy 4
- (b) Methanogens 4
- (c) Verrucomicrobia 4
- (d) Nitrospira