



PR-003-1582001

Seat No. _____

M. Phil. (Microbiology) (Sem. II) (CBCS) Examination

August - 2020

Extremophiles & Metagenomics : Paper - 202

Faculty Code : 003

Subject Code : 1582001

Time : 3 Hours]

[Total Marks : 100

1 Answer Any Ten : (2 marks each) 20

- (i) What are taxa specific molecular signatures?
- (ii) What are conserved signature proteins?
- (iii) Enlist methods used to assemble phylogenetic trees.
- (iv) Comment on the unculturability of bacteria.
- (v) State the difference between murein and pseudomurein.
- (vi) State the differences in the cellular membranes of archaea and eubacteria.
- (vii) What is random fragment length polymorphism?
- (viii) What are hyperthermophiles?
- (ix) What is an osmolyte?
- (x) What is RT-PCR?
- (xi) What are black smokers?
- (xii) How do archaea differ from eubacteria in the context of antibiotic sensitivity?

2 Answer any Two of the following : (10 marks each) 20

- (i) Describe molecular chronometers used in the evaluation of bacterial phylogeny.
- (ii) Describe various methods used in the construction of phylogenetic trees.
- (iii) Discuss structural features of cellular rRNAs.

3 Answer the following : (10 marks each) **20**

- (i) Describe molecular methods used to investigate unculturable prokaryotes.
- (ii) Discuss biotechnological significance of unculturable prokaryotes.

OR

3 Answer the following : (10 marks each) **20**

- (i) Describe construction of metagenomic library.
- (ii) Give an account of cultivable vs. non-cultivable microbes.

4 Answer the following : (10 marks each) **20**

- (i) Comment on the genome organization of Archaea.
- (ii) Describe phylogenetic groups of Archaea.

5 Write notes on any Two of the following : (10 marks each) **20**

- (i) Adaptation mechanisms of thermophilic archaea
 - (ii) Gene regulation mechanisms in Archaea
 - (iii) Habitats of Archaea
 - (iv) Halophilic archaea
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