



NBU-003-013401 Seat No. _____

M. Sc. (Biotechnology) (Sem. IV) (CBCS) Examination

April / May - 2017

BT-419 : Molecular Phylogeny & Extremophiles

Faculty Code : 003

Subject Code : 013401

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

1 Answer the following (Any seven out of ten, **[14]**
each of 02 marks)

1. What are molecular chronometers?
2. Distinguish an unrooted and rooted tree.
3. Distinguish cultivable and non-cultivable microbes.
4. What is 16SrRNA?
5. What are archaea? Enlist its different groups.
6. Distinguish thermophilic and hyperthermophilic bacteria. Give an example of each.
7. How RELP is used - as a tool for bacterial systematic ?
8. State the role of polyamines in bacterial systematic.
9. How does an archaeal cell wall differ from its bacterial counterpart ?
10. How well do alkaliphiles regulate their cytoplasmic pH?

2 Answer the following : (Any two out of three, each **[14]**
of 07 marks)

- a. What is Phenetic diversity? Describe.
- b. Enlist various molecular approaches used in microbial taxonomy and describe any one in detail.
- c. Briefly describe endosymbiotic theory of evolution.

3 Answer the following (a & b -Both are compulsory, [14]
each of 07 marks)

- a. Describe significance of metagenomics in relation to Non-cultivable microbes.
- b. What is PCR-DGGE fingerprinting? How it is helpful in assessment of the microbial diversity?

OR

3 Answer the following (a & b -Both are compulsory, [14]
each of 07 marks)

- a. How would you build a phylogeny with rRNA?
- b. What is the metabolic potential of non-cultivable microbes?

4 Answer the following (a & b -Both are compulsory, [14]
each of 07 marks)

- a. What are general characteristics of methanogenic bacteria? How would you distinguish them from other groups?
- b. Write a short note on "Archaeal habitats".

5 Answer the following (Any two out of four, each [14]
of 07 marks)

- a. Discuss physiology, ecological significance and habitats of psychrophiles.
- b. How halophiles adapt in hyper saline environment? Describe.
- c. Write a note on "Archaeal genomics"
- d. What is bacteriorhodopsin? Discuss.
