



NBU-003-019401 Seat No. \_\_\_\_\_

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

**April / May - 2017**

**Microbiology**

*(MICRO-419 : Molecular Phylogeny & Diversity)*

*(CORE - I)*

**Faculty Code : 003**

**Subject Code : 019401**

Time : 2½ Hours ]

[ Total Marks : 70

- Instructions :** (1) All questions are compulsory.  
(2) Support your answers with suitable illustrations where required.

**1 Answer any seven : (2 Marks each) 14**

- (a) What are cultivable and non-cultivable microbes?
- (b) What is the correlation of the molecular chronometers and evolution?
- (c) What is the role of Frankia in N<sub>2</sub>-fixation?
- (d) What are the possible reasons of the non-cultivability?
- (e) What is the correlation of the microbial diversity and microbiome?
- (f) What is the basis of phylogeny?
- (g) Expand ARDRA, PLFA, FAME, TGGE, TRFLP, DGGE.
- (h) What is the sequence and function based metagenomics?
- (i) What are various methods for microbial enumeration?
- (j) What are the characteristics sugar patterns in actinomycetes?

**2 Answer any two of the following : 7×2=14**

- (a) Discuss molecular approaches to study the taxonomy.
- (b) Describe Nocardia, Rhodococcus and Actinoplanes with respect to their characteristics and ecological significance.
- (c) Discuss merits and demerits of the classical methods for studying microbial taxonomy.

**3** Answer the following : (7 marks each) **14**

- (a) Discuss the taxonomic position of Rhizobia belonging to alphaproteobacteria.
- (b) Discuss non-cultivable microbes and their biotechnological prospects.

**OR**

**3** Answer the following : (7 marks each) **14**

- (a) Discuss characteristics and significance of Streptomyces.
- (b) Discuss various approaches to study the non-cultivable microbes.

**4** Answer the followings : (7 marks each) **14**

- (a) Discuss actinobacteria with respect to their general characteristics, ecological significance and biotechnological potential
- (b) Describe characteristic features of Enterobacteriaceae, Pseudomonadaceae and Xanthomonadaceae family

**5** Write comments on any **two** of the following : (7 marks each) **14**

- (a) Lactobacillaceae
- (b) Gram negative Nonproteobacterial phyla
- (c) Phylogenetic classification of nitrifying proteobacteria
- (d) Life cycle of any budding and appendaged betaproteobacteria.

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