# CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY
# CHANGA

**M. Sc. (BT/MI) Sem - I Examination (Backlog), 2011-12**

**BT/MI - 701 General Microbiology**

**Date: 16.04.12, Monday** **Time:10.00 a.m. to 01.00 p.m** **Maximum Marks:70**

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**Instructions :**

1. Provide all necessary information as required in the answer sheet.
2. Attempt all questions.
3. Questions in **Part A** should be answered in the question paper itself. Please **do not write** your candidate ID number on the question paper for Part A.
4. Write answers for Section I and Section II of **Part B** in separate answer sheets.
5. Use of cell phones is strictly prohibited.
6. Use of non-programmable calculators may be allowed if needed.

**PART A** **Total marks: 20**

**Q1. Choose the correct option and put √ mark in front of it:**

1. The first observation that bacteria-like organisms could be found in normal air was by
   (a) Anton Leeuwenhoek (b) Louis Pasteur
   (c) Robert Koch (d) Joseph Meister

2. Bacteria are eukaryotic miocroorganisms □ TRUE □ FALSE

3. Potato was the first successful solid medium used for isolation of bacteria:
   □ TRUE □ FALSE

4. Filter sterilization is used for following type of media
   (a) Starch (b) Cellulose (c) Protein (d) None of the above

5. The organisms belonging to the following bacterial phylum use hydrogen for energy production and reduce oxygen
   (a) *Cyanobacteria* (b) *Chloroflexi* (c) *Thermotogae* (d) *Aquificae*

6. The following term describes the relational position of a species or population in its habitat
   (a) Niche (b) Guild (c) Community (d) None of the above

7. In the following technique 5 to 7 conserved house-keeping genes are **NOT** sequenced and compared to avoid misleading results
   (a) FISH (b) FAME (c) rRNA sequencing (d) All of the above

8. For determining the pattern of spontaneous mutations under selective neutrality one should examine:
   (a) Exons (b) Promoter region (c) Pseudogenes (d) Genes coding for RNA

9. Winogradsky column is an example of microcosm □ TRUE □ FALSE

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10. The increase in sequence dissimilarity after divergence may be due to
    (a) Parallel substitution (c) Convergent substitution
    (b) Back substitution (d) None of the above

11. The arranges organisms into groups whose members share many characteristics and reflect many of their biological nature
    (a) Taxonomy (b) Natural classification (c) Genetic classification (d) All of the above

12. The methamatical index that describe the richness and apportionment of species within a community is called
    (a) Genetic diversity (b) Species diversity (c) Ecological diversity (d) All of the above

13. Basidiomycetes produce following number of spore during sexual reproduction
    (a) 5 (b) 6 (c) 4 (d) None of the above

14. Clam connection are present on secondary mycelia □ TRUE □ FALSE

15. Nutritionally, fungi may best be characterized as
    (a) Photosynthetic autotrophs (c) Absorptive heterotrophs.
    (b) Chemosynthetic autotrophs (d) Ingestive heterotrophs

16. Trisporic acid suppress asexual reproduction in *Zygomycota*
    □ TRUE □ FALSE

17. Mean doubling time of an organism growing in a batch culture is equivalent to
    (a) doubling time (c) time required for DNA replication
    (b) Generation time (d) all of the above

18. Exopolysaccharides are the macromolecules produced by some microorganisms in the environment to form
    (a) Biofilms (b) Colonies (c) Lichen (d) All of the above

19. The following are the organisms that derive electrons from inorganic compounds for the generation of energy
    (a) Chemetrophs (b) Lithotrophs (c) Chemoheterotrophs (d) None of the above

20. Which of the following media is differential media
    (a) MacConkey's (c) Salmonella Shigella agar
    (b) EMB agar (d) All of the above

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**PART B** **Total Marks: 50**

## SECTION I

**Q.1 (A) Write a short note on the following (ANY TWO)** **(06)**

(i) Sterilization
(ii) Mention various experiment which defeat of spontaneous generation theory
(iii) Principle of Gram staining technique

**Q.1 (B) Write briefly on following (ANY TWO)** **(04)**

(i) Koch's postulates
(ii) Preservation of microorganisms
(iii) Chemical agent used for control of microorganisms

**Q.2 (A)** Describe in detail **(ANY TWO)** **(06)**

(i) General characteristic of fungi
(ii) *Basidiomycota*
(iii) Reproduction in fungi

**Q.2 (B)** Explain briefly **(any two)** **(04)**

(i) Economic importance of red algae
(ii) Blue green algae
(iii) Sexual reproduction in *Zygomycota*

## SECTION II

**Q. 3 (A) Write a note on the following (ANY TWO)** **(06)**

(i.) Numerical Taxonomy
(ii.) Bacterial speciation
(iii.) Evolutionary distance

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**Q. 3 (B) Write brief note on following (ANY TWO)** **(04)**

(i) horizontal gene transfer
(ii) endosymbiotic theory
(iii) Transposition and Retroposition

**Q. 4 (A) Write short note on following (ANY TWO)** **(06)**

(i) Genetic diversity index
(ii) Application of signature sequences
(iii) Multigene family and Supragene

**Q. 4 (B) Explain briefly (ANY TWO)** **(04)**

(i) Biologically controlled ecosystem
(ii) Genetic diversity index
(iii) FISH

**Q. 5 (A) Write a note on the following (ANY TWO)** **(06)**

(i) Importance of C, N and P source for growth of microorganisms
(ii) Quantification of microbial growth
(iii) Types of media

**Q. 5 (B)Write following** **(04)**

(i) Difference between lag and log phase
(ii) "Study of microorganisms is most preferred method" - Justify