M.Sc. BOTANY
Fourth Semester
MICROBIOLOGY
(MSB – 402 E)

Duration: 3Hrs. **Full Marks: 70**

Part-A (Objective) =20
Part-B (Descriptive) =50

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins. **Marks: 50**

Answer any *four* from *Question no.* 2 to 8
***Question no.* 1 is compulsory.**

1. Describe the different methods of classification of microorganisms. Why is 16SrDNA considered important in bacterial taxonomy? Write a note on ribotyping. (5+3+2=10)
2. Describe oxygenic and an-oxygenic photosynthesis. Discuss the role of proton motive force in ATP synthesis. (6+4=10)
3. Define biogeochemical cycling. Discuss the role of microbes in N_2 and P cycling. What is the ecological significance of these cycles? (1+7+2=10)
4. Describe some important microbe-microbe and plant-microbe interactions. What role do these interactions play in the ecosystem? (8+2=10)
5. Write brief explanatory notes on the following: (5+5=10)
   a. Air microflora and allergic disorders.
   b. Bacteriological analysis of water.
6. Describe the methods of genetic recombination in bacteria. Discuss site directed mutagenesis and its significance. (6+4=10)
7. Describe the role of recombinant DNA technology in modern agriculture and medicine. (10)

8. Write notes on the following: (5+5=10)

a. Gene therapy

b. Microbial diversity

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MSB/10/16

2017/06

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Duration: 20 minutes **Marks – 20**

(PART A - Objective Type)

I. Choose the correct answer: **1×20=20**

1. Cows can digest straw because they contain:
   a) Cellulose hydrolyzing microorganisms.
   b) Protein hydrolyzing bacteria.
   c) Lipid hydrolyzing microorganisms.
   d) Amino acid degrading bacteria.

2. Microorganisms that grow on and in the aerial surface of plants are called:
   a) Rhizosphere b) Phyllosphere
   c) Rhizoplane d) Chemosphere

3. Which of the following genera possess a tumor inducing plasmid?
   a) Rhizobium b) Pseudomonas
   c) Agrobacterium d) Frankia

4. Who put forward the 'germ theory of the disease'?
   a) Leeuwenhoek b) Louis Pasteur
   c) Robert Koch d) Nocard and Roux

5. Vinegar is obtained from sugar by:
   a) *Lactobacillus* b) *Acetobacter*
   c) *Nitrosomonas* d) *Salmonella*

6. Restriction enzymes are also called as:
   a) Biological scissors b) Molecular Scalpels
   c) Molecular scissors d) All of these

7. The genes formed by the joining of DNA segments form two different sources are called as:
   a) Joined gene b) Recombined gene
   c) Integrated gene d) Chimaeric gene

8. In gel electrophoresis, DNA molecules migrate from _____ to _____ ends of the gel.
   a) Positive to negative b) Negative to positive
   c) Acidic to basic d) Long to short distance

9. Which one of the following characters are controlled by plasmids?
   a) Fermentation of lactose b) Resistance to antibiotics
   c) Toxin production d) All of these

10. The type of recombination that commonly occurs between a pair of homologous DNA sequences is:
   a) Mutagenic recombination b) Site specific recombination
   c) Replicative recombination d) General recombination

11. Addition or deletion of a nucleotide base pair involves:
   a) Point mutation b) Silent mutation
   c) Non-sense mutation d) Frame shift mutation

12. In his transformation experiments, what did Griffith observe?
   a) Mutant mice were resistant to bacterial infections.
   b) Mixing a heat-killed pathogenic strain of bacteria with a living non-pathogenic strain can convert some of the living cells into the pathogenic form.
   c) Mixing a heat-killed non-pathogenic strain of bacteria with a living pathogenic strain makes the pathogenic strain non-pathogenic.
   d) Infecting mice with non-pathogenic strains of bacteria makes the mice resistant to pathogenic strains.

13. The concept of putting microbes to help clean up the environment is called:
   a) Pasteurization b) Bioremediation
   c) Phytoremediation d) Mycoremediation

14. Treatment of municipal water supplies is based upon:
   a) coagulation, filtration, chlorination
   b) chlorination, filtration, coagulation
   c) filtration, coagulation, chlorination
   d) coagulation, chlorination, filtration

15. Activated sludge contains large number of:
   a) Bacteria b) Yeasts and molds
   c) Protozoa d) All of the above

16. Water testing relies on the detection of certain indicator organisms known as:
   a) Acid fast bacteria b) Bacteroids
   c) Coliforms d) Protozoa

17. The process of soil formation includes:
   a) Withering
   b) Pedogenesis
   c) Withering followed by pedogenesis.
   d) Pedogenesis followed by withering.

18. Which fraction of the organic matter resists microbial decomposition?
   a) Cellulose b) Lignin
   c) Starch d) None of these

19. All of the following are free living nitrogen fixers except:
   a) *Frankia* b) *Azospirillum*
   c) *Azotobacter* d) *Rhodospirillum*

20. An association in which one population of organisms benefits while the other is neither harmed nor helped is called a(n) _____ association.
   a) Parasitic b) Proto-cooperative
   c) Commensalism d) Mutualism

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University of Science and Technology, Meghalaya

Date Stamp:_____

SESSION: 2016-17

COURSE_____PAPER Code:_____

NAME OF THE PAPER:_____

SEMESTER_____

Instructions to Candidates

1. This answer booklet has 4 pages. Please check before writing whether it is complete or in good condition.
2. Do not write your name anywhere in the answer booklet.
3. Write legibly on both sides of the paper
4. You may use some space for any rough notes or calculation on the answer booklet if you need. These rough notes, calculations must be scored out before submitting the answer booklet.
5. Do not bring any book or loose paper in the examination hall.
6. Do not tear any page from the answer booklet.
7. Do not write anything on the question paper or blotting paper or any pieces of paper while you are in the examination hall.
8. Any act of indiscipline or misbehavior in the examination hall will result in your expulsion.
9. No examinee is allowed to leave the examination hall until 30 minutes lapse after the commencement of the examination.
10. Additional answer sheet will be supplied after the main answer booklet is completed.

For Objective Type Questions

Page No.	Marks
Total	

For Descriptive Type Questions

Question No.	Marks
Total	
Grand Total	

Session: 2016-17

Course_____

Roll No._____

Enrollment No._____

Semester_____

Name of the Paper_____

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Paper Code_____

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Scrutinizer's Signature **Examiner's Signature** **Invigilator's Signature**