

**M.Sc. BOTANY  
FOURTH SEMESTER  
MICROBIOLOGY  
MSB-402 E**

**SET  
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

( Objective )

Time: 30 mins.

Marks: 20

**Choose the correct answer from the following:**

**1 × 20 = 20**

- The term "animalcules" was first used by Leeuwenhoek for referring:  
a. Archaeobacteria  
b. Bacteria  
c. Mycoplasmas  
d. Microorganisms
- The group of microorganism which share common characteristic features of both bacteria and fungi is:  
a. Protozoa  
b. Molds  
c. Actinobacteria  
d. Cyanobacteria
- Which of the following is not a characteristic feature of yeast?  
a. Plasmodesmatal connections  
b. Pleuromorphism  
c. Eukaryotic  
d. Sexual reproduction
- An example of sulphur bacteria is:  
a. *Ferrobacillus ferrooxidans*  
b. *Rhodospirillum rubrum*  
c. *Thiobacillus thiooxidans*  
d. *Nitrobacter vulgaris*
- Phylogenetic information of microorganisms are mostly studied using:  
a. 18S rRNA  
b. 16S rDNA  
c. 23S rRNA  
d. 16S rRNA
- Who is known as the Father of Modern Microbiology?  
a. Louis Pasteur  
b. Anton van Leeuwenhoek  
c. Robert Koch  
d. Zacharias Janssen
- The major driving force regulating microbial diversity and activity on plant roots is:  
a. Rhizoplane  
b. Rhizosphere  
c. Rhizodeposition  
d. Root hairs
- Which of the following soil horizon consists of minerals with humus?  
a. Horizon O  
b. Horizon A  
c. Horizon E  
d. Horizon B
- The air microorganism *Streptococcus gallolyticus* causes:  
a. Allergy  
b. Skin infection  
c. Respiratory infections  
d. Pink eye disease
- The microorganism responsible for nitrogen fixation in rice paddy fields is:  
a. *Azolla*  
b. *Anabaena*  
c. *Nostoc*  
d. *Frankia*

11. The gene or fragment which is transferred from the donor to the recipient is referred to as:
- Exogenote
  - Endogenote
  - Merozygote
  - None of the above
12. Which of the following is not associated with horizontal gene transfer?
- Conjugation
  - Budding
  - Transformation
  - F-plasmid
13. The uptake of a naked DNA molecule or fragment from the medium by a cell and incorporated it into its own chromosome:
- Transduction
  - Transformation
  - Co-transduction
  - Conjugation
14. The term "mutation" was coined by:
- Linus Pauling
  - Gregor Mendel
  - Eugene Odum
  - Hugo de Vries
15. Which of the following is best associated with site directed mutation?
- Natural selection
  - Frameshift mutation
  - Chromosomal aberrations
  - Gene editing
16. The basic requirement in recombinant DNA technology is:
- Restriction endonucleases
  - Cloning vectors
  - Plasmids
  - Ligase enzymes
17. The short stretches of DNA strands that are free to form hydrogen bonds are known as:
- Methylated bases
  - Blunt ends
  - Sticky ends
  - None of the above
18. A good vector should have:
- At least one marker
  - Restriction sites
  - Large size
  - A site of replication
19. The first artificial cloning vector designed is:
- Bacterial Artificial Chromosome
  - Yeast Artificial Chromosome
  - pBR322
  - pUC19
20. Which of the following is known as "nature's genetic engineer"?
- Plasmids
  - Restriction endonuclease
  - Human Artificial Chromosome
  - Agrobacterium tumefaciens*

**( Descriptive )**

Marks : 50

Time : 2 hr. 30 mins.

[ Answer question no.1 & any four (4) from the rest ]

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| 1. Define rhizosphere. Discuss the role of rhizospheric microorganisms on plants under biotic stress.  | 2+8=10       |
| 2. With the help of suitable diagrams, explain the four different groups of protozoa. Give the significance of protozoa.   | 8+2=10       |
| 3. With suitable examples, discuss in brief the different nutritional patterns of microorganisms.  | 10<br>2×5=10 |
| 4. Answer the following:<br>a) Discuss in brief the three types of carbon cycle.<br>b) Water microbiology  | 2+7+1=10     |
| 5. What is genetic recombination? With suitable diagrammatic representations, explain in detail bacterial transformation. What is the significance of genetic recombination? | 2+4+4=10     |
| 6. Define mutation. Write short notes on:<br>a) Mutagens<br>b) Site directed mutagenesis   | 2+8=10       |
| 7. What are restriction endonucleases? With appropriate diagram, discuss the characteristics and importance of pBR322 vector.  | 2×5=10       |
| 8. Write notes on:<br>a) Agrobacterium mediated gene transfer<br>b) Gene therapy   |              |

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