

Seat No. : \_\_\_\_\_

**SM-110**  
**September-2020**  
**B.Sc., Sem.-VI**  
**311 : Microbiology**  
**(Biotechnology)**  
**(New)**

**Time : 2 Hours]**

**[Max. Marks : 50**

- Instructions :**
- (1) Students should write the answers from whichever the question paper applicable to them, either “**New Course**” of “**Old Course**” and it must be mentioned at the beginning of the answer paper.
  - (2) Answer any **three (03)** questions out of **eight (08)** questions.
  - (3) Question No. **9** is compulsory.
  - (4) Draw figures wherever necessary.

**Section – I**

1. Explain interdisciplinary and multidisciplinary nature of biotechnology. **14**
  
2. (A) Discuss modern Biotechnology. **7**  
(B) Discuss scope of Biotechnology. **7**
  
3. Discuss principles, types and applications of centrifuge. **14**
  
4. (A) Discuss agarose gel electrophoresis technique. **7**  
(B) Write a note on biosensors. **7**
  
5. Discuss plant tissue culture in detail. **14**

6. (A) Describe principle and applications of Northern blotting. 7  
(B) Write a note on Crisper Cas 9. 7
7. Discuss transgenic animals with suitable examples. 14
8. (A) Write a note on IPR. 7  
(B) Discuss baker's yeast production process. 7

### Section – II

9. Answer in short : (Any **Eight**) 8
- (1) Mention any one application of environmental Biotechnology.
  - (2) Name one centre of biotechnology research and education established by Government of India.
  - (3) Give full form of GSBTM.
  - (4) Name one Biotechnology company of Indian origin.
  - (5) What is Beer Lambert's law ?
  - (6) Give principle of paper chromatography.
  - (7) What is HPLC?
  - (8) Give full form of SDS PAGE.
  - (9) What is totipotency ?
  - (10) What are cell lines ?
  - (11) What is callus ?
  - (12) Name one enzyme used in tissue disaggregation.
  - (13) Name a bacterium used for plant transgenesis.
  - (14) What is electroporation ?
  - (15) Name two enzymes with therapeutic use.
  - (16) Name herbicide resistant plant.

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**(Geomicrobiology)**  
**(Old)**

**Time : 2 Hours]**

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**Section – I**

1. Discuss soil as important microbial habitat. **14**
2. (A) Describe significance of geomicrobiology as a branch of microbiology. **7**  
(B) Discuss fresh water ecosystems as microbial habitat. **7**
3. Describe non-molecular methods to study geomicrobially important micro-organisms. **14**
4. (A) Discuss genetical approaches to study geomicrobially important microorganisms. **7**  
(B) Describe geomicrobially active physiological groups of prokaryotes. **7**
5. Discuss microbial oxidation of metal sulphides. **14**

6. (A) Discuss Acid mine drainage. 7  
(B) Write a note on biobeneficiation. 7
7. Geomicrobiology of methane. 14
8. (A) Describe the role of microbes in peat formation. 7  
(B) Microbial desulfurization of coal. 7

### Section – II

9. Answer in short : (Any **Eight**) 8
- (1) Name three major structural compartments of the Earth.
  - (2) Define soil.
  - (3) What is lithification ?
  - (4) Give example of any naturally occurring rock type.
  - (5) Give full form FISH.
  - (6) Name any two geomicrobially important prokaryotes.
  - (7) What are photoheterotrophs ?
  - (8) Name any two laboratory methods used to study geomicrobial processes.
  - (9) Name any two metal sulphides of geomicrobial interest.
  - (10) Name any two pyrite oxidizing bacteria.
  - (11) Give any one problem related to acid mine drainage.
  - (12) What is bioleaching ?
  - (13) Name any one novel coenzyme present in methanogens.
  - (14) What is coal ?
  - (15) What are fossil fuels ?
  - (16) Name any two microbes involved in desulfurization of coal.