

**Bachelor of Science (B.Sc.) Semester-I (C.B.S.) Examination**  
**BIOTECHNOLOGY (Microbiology)**  
**Compulsory Paper-1**

Time : Three Hours]

[Maximum Marks : 50

**Note :—** (1) All questions are compulsory and carry equal marks.

(2) Draw well labelled diagrams and give examples wherever necessary.

1. Describe contributions of Louis Pasteur in the field of microbiology. 10

**OR**

Describe the following :

- (a) Gram staining. 5  
 (b) Acid-fast staining. 5
2. Describe the structure of cell wall of Gram positive bacteria. 10

**OR**

Describe the process of endospore formation in bacteria. 10

3. (a) Differentiate between bacterial and archaeal cell membranes. 2½  
 (b) Give the brief idea of Bergey's manual of determinative bacteriology. 2½  
 (c) Explain the helical symmetry of viruses. 2½  
 (d) Briefly describe Lysogeny. 2½

**OR**

- (e) Explain the concept of three distinct archaeal groups. 2½  
 (f) Differentiate between bacteria and viruses. 2½  
 (g) Classify the viruses on the basis of nucleic acids. 2½  
 (h) Diagrammatically explain Lytic cycle. 2½
4. Describe the basic nutritional requirements of bacteria. 10

**OR**

- (a) What are natural media ? Give various ingredients used in natural media and explain any two of them. 5  
 (b) Describe selective and differential media giving suitable examples. 5
5. Solve any **ten** :
- (i) Define numerical aperture.  
 (ii) What is the importance of oil in oil immersion objective ?  
 (iii) What is mordant ?  
 (iv) Give one difference between slime layer and capsule.  
 (v) What are plasmids ?  
 (vi) Why endospores are resistant to high temperature ?  
 (vii) What is bacteriophage ?  
 (viii) What is enriched media ?  
 (ix) What is the source of agar-agar ?  
 (x) What are trace elements ?  
 (xi) Give any two general properties of viruses.  
 (xii) Give any two general properties of archaea. 1×10=10