



Second Semester B. Sc. Examination

MICROBIOLOGY

Paper - II

(Microbial Techniques)

Time : Three Hours]

[Max. Marks : 50

N. B. : (1) All questions are compulsory and carry equal marks.
(2) Draw well labelled diagrams and give examples wherever necessary.

1. (a) Give principle and applications of dark field microscope. 5
(b) Explain resolving power and numerical aperture of a bright-field microscope. 5

OR

(c) Give principle, applications and limitations of confocal microscopy. 5
(d) Compare TEM with SEM with their ray diagram. 5

2. Describe the principle, working and application of fluorescent microscopy. 10

OR

Explain the principle, working and applications of phase contrast microscopy. 10

3. (a) Describe principle and procedure of Gram's staining. $2 \frac{1}{2}$

(b) Explain principle and procedure of Acid-fast staining. $2 \frac{1}{2}$

(c) Explain chemical theory of staining. $2 \frac{1}{2}$

(d) Give principle and procedure of flagella staining. $2 \frac{1}{2}$

OR

(e) Describe principle and procedure of endospore staining. $2 \frac{1}{2}$

(f) How will you stain capsule by negative staining? $2 \frac{1}{2}$

(g) Define the terms: Chromophore, auxochrome and chromogens. $2 \frac{1}{2}$

(h) Explain different types of stains. $2 \frac{1}{2}$

4. Describe any four techniques to obtain pure culture.

OR

What is synchronous culture ? Describe various techniques to obtain synchronous culture. 10

5. Solve any **ten** questions :—

(i) Write any two limitations of electron microscopy over light microscopy. 1

(ii) Name any two oils used in the bright field microscopy while using oil immersion lens. 1

(iii) Name any two microscopies where 3-dimensional pictures are obtained. 1

(iv) Give any two limitations of atomic force microscopy. 1

(v) Give any two advantages of Atomic Force Microscopy over Electron Microscopy. 1

(vi) What is the role of "AFM probe" in Atomic Force Microscopy ? 1

(vii) Give one limitation of flagellar staining. 1

(viii) What is the difference between stain and dye? 1

(ix) What is mordant ? Give examples. 1

(x) What are limitations of turbidity method for measuring growth of micro-organisms? 1

(xi) Who introduced replica plate technique ? 1

(xii) What is auxanographic technique ? 1