

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. 3
(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 fluorescecent microscopy.

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