2009

M.Sc.

1st Semester Examination

MICROBIOLOGY

PAPER—I

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any *two* questions from each group.

Group—A

[Marks : 20]

Answer any *two* questions.

1. (a) How does bacterial nucleoid differ from a true nucleus ?

   (b) How do some bacteria change their buoyant densities ?

(c) For what functions are bacterial pili used? What is their structure and how are they assembled?

(d) Schematically represent the synthesis steps of bacterial cell wall. 2+2+3+3

2. (a) Explain how Continuous-culture device works. What is the point of using such a device?

(b) Define the D and Z value of an organism in moist heat mediated sterilization.

Calculate the time to reduce a population of *clostridium botulinum* spores in phosphate buffer from 10^{12} spores to 10° at 111°C where

D_{121} = 0·204 min and Z = 10°C. 5+5

3. (a) What are effects of Lysozyme and sulfonamides on bacterial cell?

(b) Write notes on :

(i) Living magnet ;

(ii) Super Oxide dismutase. $(2\frac{1}{2}\times2) + (2\frac{1}{2}\times2)$

Group—B

[Marks : 20]

Answer any *two* questions.

4. (a) Why is it important to name and classify bacteria?

(b) How is DNA melted and reannealed, and why is this useful in bacterial taxonomy?

(c) State the importance of type strain in bacterial species.

(d) How would you go about identifying a bacterium that you isolated from a soil habitat? 2+3+2+3

5. Write notes on : $2\frac{1}{2} \times 4$

(a) PHB ;

(b) Numerical taxonomy ;

(c) Reserve food materials of Cyanobacteria ;

(d) Phylogenetic tree.

6. What is a type culture for bacteria ? Name two microbial culture collections in India. What is ATCC ? Briefly describe two important methods for preserving / maintaining bacterial culture over many years.

1+2+1+(2×3)