2011

M.Sc.

1st Semester Examination

MICROBIOLOGY

PAPER—I (MCB-101)

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) What is meant by exponential growth of a bacterial culture ?

(b) Why is continuous culture of microorganisms described as an open system ?

(c) How is the rate of cell growth controlled in a chemostast ?

(d) In a bacterial growth Kinetic study the *Pseudomonas* sp. was grown in a minimal medium containing salicylate as a sole source of carbon and energy source and following results were obtained. Calculate the specific growth rate of the *Pseudomonas* sp. for the exponential phase.

Time (h)	*Culturable cell count (cfu/ml)*
0	$3{\cdot}2 \times 10^4$
1·3	$3{\cdot}2 \times 10^4$
2·3	$3{\cdot}2 \times 10^4$
3·3	$3{\cdot}2 \times 10^4$
4·3	$1{\cdot}5 \times 10^5$
5·3	$1{\cdot}5 \times 10^7$
6·3	$8{\cdot}1 \times 10^7$
7·3	$3{\cdot}2 \times 10^8$
8·3	$5{\cdot}5 \times 10^8$
9·3	$8{\cdot}0 \times 10^8$
10·3	$1{\cdot}0 \times 10^9$
11·3	$1{\cdot}7 \times 10^9$
12·3	$2{\cdot}1 \times 10^9$
13·3	$2{\cdot}3 \times 10^9$

$1\frac{1}{2}+1\frac{1}{2}+3+4$

2. (a) How will you isolate nitrifying bacteria from soil ?

(b) How are pure cultures isolated ? How are they preserved ?

(c) Compare the cell wall of Eubacteria with that of archaeobacteria.

(d) Write down the membrane constituents in Archaea and mention its relation with adaptation.

(e) Why the anaerobic bacteria can not tolerate the presence of oxygen? 2×5

3. Write notes on : $4\times2\frac{1}{2}$

(a) Phenol co-efficient;

(b) Ow activity ;

(c) Compounds that inhibit cell wall synthesis ;

(d) Compounds Lyophilization.

Group—B

[Marks : 20]

Answer any *two* questions.

4. (a) State the four major parts of Bergey's mannual (9th edition).

(b) Mention the characteristics that are used in bacterial classification.

(c) What is neumerical Taxonomy?

(d) Current phylogenetic status of prochloron. 3+3+2+2

5. Give an idea about the structure, location & function of the following :

(a) Cyanelles;

(b) Carboxysome;

(c) Enterosome;

(d) Magnetosome. $2\frac{1}{2}\times4$

6. (a) What is Chromophore ?

(b) How basic dye helps in staining of bacteria ?

(c) Mention the principle of negative staining & Acid fast staining.

(d) Mention the source & functions of lysozyme.

(e) Differentiate protoplast with that of Spheroplast.

1+2+4+3
