

M.Sc 1st Semester Examination, 2013

MICROBIOLOGY

PAPER – 101

Full Marks : 40

Time : 2 hours

Answer any **two** questions from each Group

*The figures in the right hand margin indicate marks
Candidates are required to give their answers in their
own words as far as practicable*

Illustrate the answers wherever necessary

GROUP – A

[Marks : 20]

1. (a) Explain how crystal violet stains cell in Gram staining.
- (b) How super oxide dismutase and other enzymes destroy the toxic effects of oxygen.

(Turn Over)

(2)

(c) What is phycobilisome state its molecular architecture and function.

(d) What is synthetic media ? How does it differ from complex media ? What are the specific usefulness of both the media ? $2 + 3 + 3 + 2$

2. (a) Write the importance of exponential phase of bacterial growth in a closed system. Why do cells enter the stationary phase ? A bacterial culture is grown using Octadecane ($C_{18}H_{36}$) as the sole source of carbon and energy. The cell yield value is determined by dry weight analysis to be 1.49 ($Y = 1.49$). What percentage of the substrate carbon will be found as cell mem. and as CO_2 ?

(b) Write the growth behaviour of bacteria in open system with special reference to tubidostat. $2 + 1 + 4 + 3$

3. Answer any *four* of the following : $2 \frac{1}{2} \times 4$

(a) Types of capsule and their functions

- (b) Cell wall of archaebacteria and its relevance to extremophilic survival.
- (c) Compounds that inhibit cell wall synthesis.
- (d) ABC-transport system.
- (e) Methods for long term preservation of bacterial culture.

GROUP – B

[Marks : 20]

4. (a) What is type strain ? State its importance.
- (b) How will you cultivate anaerobic bacteria ?
- (c) What is T_m ? State its significance.
- (d) State the major characteristics of micro-organisms that are studied to identify the bacteria. 2 + 3 + 2 + 3
5. Write notes on the following : $2\frac{1}{2} \times 4$
- (i) Reserve food material of bacteria

(ii) Prochlorons

(iii) Bacterial Endospore

(iv) Bergey's Manual of Systematic Bacteriology.

6. (a) How bacteria move? State its molecular mechanism.
- (b) What is L-form bacteria and how does it differ from mycoplasma?
- (c) What is twitching?
- (d) Write a brief note on bacterial nucleoid.

(1 + 2) + 2 + 1 + 4