

2017

MICROBIOLOGY

[Honours]

PAPER – I

Full Marks : 90

Time : 4 hours

*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

Answer any two questions : 15 × 2

- 1. (a) What did Edward Jenner invent and how?
What were the scientific contributions of
M.W. Beijerinck ?**

(Turn Over)

- (b) What do you mean by biopesticides ?
Distinguish between biofertilizer and chemical fertilizer.
- (c) Name one bacteria and one mold responsible for deterioration of food. Define biogenesis with suitable example.
(3 + 2) + (2 + 3) + (1 + 1 + 3)
2. (a) Discuss the five kingdom system of classification and who proposed this system ? What were the limitations of Haeckel's system of classification ?
- (b) Describe the cell structure and reproduction of *Chlorella* sp.
- (c) Name one beneficial and one poisonous fungi. (3 + 1 + 2) + (3 + 4) + (1 + 1)
3. (a) What is the theory of spontaneous generation of microorganisms ? How does it disprove ?
- (b) Define capnophiles. What is the difference between spheroplast and protoplast ? Write the chemical composition of fungal cell wall.

- (c) Which pH level is ideal for the growth of bacteria in food? Classify the bacteria based on growth at different pH.
(2 + 3) + (1 + 2 + 2) + (1 + 4)
4. (a) What is the principle of fluorescent microscope? What do you mean by numerical aperture of microscope?
- (b) Describe the three major techniques used for pure culture.
- (c) Write down the classification of virus according to Baltimore.
(3 + 1) + (2 + 2 + 2) + 5

GROUP – B

Answer any five questions : 8 × 5

5. (a) Draw and describe the structure of HIV.
- (b) What are virusoids? Name one disease caused by prions. 5 + (2 + 1)
6. (a) Compare the cell wall structure of Gram positive and Gram negative bacteria.

- (b) What is endospore ? Give one example of endospore forming bacterium. 6 + (1 + 1)
7. (a) What is synchronous culture ?
- (b) Name the phases of bacterial growth curve. What is the main difference between bacterial growth and fungal growth pattern. 3 + (2 + 3)
8. (a) What is meant by the term "differential staining" ?
- (b) What is an acid fast stain used for ?
- (c) What is mordant ? Give one example of it. 3 + 2 + (2 + 1)
9. Write short notes on : 2 × 4
- (i) Diauxic growth
- (ii) Carboxysome
- (iii) Glycocalyx
- (iv) Drawbacks of Koch's postulates.

10. (a) Compare between bactericidal and bacteriostatic agents.
- (b) Distinguish between :
- (i) Sterilization and Pasteurization
- (ii) Universal media and selective media. 4 + (2 + 2)
11. (a) Write the general characters of Spirochetes and Archaeobacteria.
- (b) Name two animal diseases caused by Mycoplasma. (3 + 3) + 2
12. (a) Give an account of the life cycle of *Giardia* Sp.
- (b) Describe the infective stage of *Entamoeba histolytica*. 5 + 3

GROUP –C

Answer any five questions : 4 × 5

13. Define the following : 1 × 4
- (a) Heterothallism

(b) Fairy-ring

(c) Diatomaceous earth

(d) Saprophytes.

14. Name the types and give examples of 2 + 2

(i) Cell without flagella

(ii) Cells surrounded by flagella.

15. Compare the ribosome of prokaryotes and eukaryotes. 4

16. Describe various chemical sterilization techniques used in a microbiological laboratory with suitable examples. 4

17. Describe the mode of action of any one antibiotic which affect bacterial protein synthesis. 4

18. Write the composition of Muller Hington media and where it is used. 2 + 2

(7)

19. Draw and describe the life cycle of *Penicillium* sp. 4

20. (i) Distinguish between batch and fed-batch culture.

(ii) Name two anaerobic bacteria. 2 + 2
