2018

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*) Write the contribution of following scientists :

(*i*) Louis Pasteur

(*ii*) Alexander Flemming.

(b) Write down the role of microorganisms in clean up of environmental pollution.

(c) What do you mean by microbial spoilage of food ? Mention any four common examples of milk spoilage.　　(3 + 3) + 3 + (3 + 3)

2. (a) Write down the principle and uses of transmission electron microscope (TEM).

(b) What is shadow casting ?

(c) Classify algae according to Smith and mention the class characters.

(d) What is slant and stab culture ?
　　　　　　　　　　(3 + 2) + 3 + 5 + 2

3. (a) Give a brief idea about the classification of viruses. Write down the characteristic features of Baltimore classification.

(b) Describe the stages of endospore formation with diagram.

(c) What do you mean by diauxic growth ?

　　　　　　　　(Continued)

(d) Write down the differences between batch and continuous culture. $(2 + 2) + 5 + (3 + 3)$

4. (a) What is selective medium ? How does it differ from differential medium ?

(b) Write down the differences between TEM and SEM. What is meant by resolving limit of a light microscope ?

(c) Describe the ultrastructure of Gram-negative bacterial flagella.

(d) What are viroids ? Name one disease caused by viroids. $(2 + 2) + (3 + 2) + 3 + (2 + 1)$

GROUP – B

Answer any **five** questions : 8×5

5. (a) Draw and describe the structure of a T-even phage.

(b) Classify viruses on the basis of capsid symmetry. $5 + 3$

(*Turn Over*)

6. (a) What is meant by obligate parasite ? Give one example.

   (b) Write the differences between chemostat and turbidostat.

   (c) What is 'oxygen toxicity' ?   2 + 3 + 3

7. (a) How would you grow bacteria in anaerobic condition ?

   (b) Describe the fruit body of *Agaricus* with suitable diagram.   4 + 4

8. (a) Write the differences between algae and fungi.

   (b) What is the importance of fungal culture in industry ? Give one example of industrial use of fungi.   3 + (4 + 1)

9. (a) Classify Protozoa according to Levine etl and mention the class characters.

   (b) Write down the life-cycle of *Entamoeba histolytica*.

   (c) Differentiate between Gram-staining and acid-fast staining.   (2 + 2) + 2 + (1+ 1)

     (Continued)

10. (a) Describe the role of bacteriophage in the process of microbial gene transport.

   (b) Write down economic importance of culture preservation for long duration. 5 + 3

11. (a) Write down the procedure of endospore formation by bacteria and importance of endospore in bacterial survival.

   (b) Write down the mode of action of UV radiation as sterilizing agent. (3 + 2) + 3

12. (a) Write in brief the molecular basis of chemotaxis in *E.Coli*.

   (b) Write down the basic mode of action of antimicrobial agents. 5 + 3

GROUP – C

Answer any **five** questions : 4 × 5

13. (a) Why do bacteria enter into stationary phase ?

(b) In which phase of life cycle do bacteria produce secondary metabolites ?

(c) What are magnetosomes ? $1 + 2 + 1$

14. Define the following terms : $2 + 2$

(a) Phenol coefficient

(b) Enrichment media.

15. (a) What is agar ? Mention its source.

(b) Give a brief account of negative staining mentioning one example. $(1 + 1) + (1 + 1)$

16. (a) Write the economic importance of *spirulina*.

(b) Write down the general characters of Mycoplasma. Name one edible mushroom. $1 + (2 + 1)$

17. (a) Define generation time and growth rate.

(b) Name two specific media used for the cultivation of fungus. $(1 + 1) + 2$

18. (a) What is ribotyping ?

(b) Write down the importance of ribotyping. $2 + 2$

(*Continued*)

19. (a) What do you mean by (+) strand and (–) strand RNA viruses ?

   (b) Give a brief description of archaeal cell wall mentioning its difference with that found in eubacteria. $(1 + 1) + 2$

20. (a) Name one antifungal and one antiviral agent.

   (b) Differentiate sterilization and disinfection.

   (c) Write the mechanism of action of chlorine as sterilizing agent. $(\frac{1}{2} + \frac{1}{2}) + (1 + 1) + 1$

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