

**M.Sc. 1st Semester Examination, 2023**

**MICROBIOLOGY**

*( Diversity and Systematics of*

*Prokaryotic Microbes)*

**PAPER – MCB-101**

*Full Marks : 50*

*Time : 2 hours*

**Answer all questions**

*The figures in the right hand margin indicate marks*

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

**UNIT –MCB-101.1**

*( Bacteriology )*

**GROUP – A**

**Answer any two questions from the following :**

**2 x 2**

*( Turn Over )*

1. Differentiate between coacervate and microsphere.
2. Mention the major conclusions of Miller-Urey experiment.
3. Give examples of two organelles which supports endosymbiotic theory.
4. What do you mean by spontaneous generation ?

### GROUP-B

Answer any two questions from the following :

4 × 2

5. What is Bergey's Manual of Determinative Bacteriology ? How prokaryotes are distributed in latest edition of Bergey's Manual of Systematic Bacteriology ?  
1 + 3
6. Write a note on : rRNA sequencing and its application in microbial identification.

7. Write down the significance of Archaea. How it differs from Eubacteria?  $2 + 2$
8. What do you mean by RNA world hypothesis? Define compartmentalization.  $2 + 2$

GROUP - C

Answer any **one** question from the following :  $8 \times 1$

9. What are the disadvantages of conventional methods for studying bacterial diversity? What is metagenomics? Why metagenomic approach is advantageous over conventional approach for studying bacterial diversity?  $2 + 2 + 4$
10. What are heterocyst and akinetes? Describe the function of heterocyst with proper diagram. Give example of two cyanobacteria.  $2 + 4 + 2$

**UNIT –MCB-101.2**

( *Virology* )

**GROUP – A**

Answer any **two** questions of the following :

2 × 2

11. How viruses differ from other obligate intracellular bacteria ?
12. Describe any one method for the quantification of plant virus.
13. Write the classification of animal viruses as done by Baltimore.
14. Write the contribution of Martinus Beijerinck to discover the virus.

**GROUP – B**

Answer any **two** questions from the following :

4 × 2

15. Compare the virion, viroids and Prions'

16. How poliovirus enters and replicates in animal cells ? 2 + 2
17. Name the ligand and receptor for Influenza virus, and write their roles in Influenza entry to host cells. Mention the roles of adenoviral E1 and E3 proteins in adenovirus replication. 2 + 2
18. How the SARS-CoV2 vaccines (Covishield and COVAXIN) have been prepared ? 2 + 2

GROUP – C

Answer any **one** question from the following :

8 × 1

19. (i) Draw the structure of Rous sarcoma virus genome and mention the functions of different genes present in it.

(ii) Describe schematically the conversion of retroviral single stranded RNA to double stranded DNA and its incorporation into host cell DNA. 4 + 4

20. (i) Write the additional genes that are present in HIV and not present in other retroviruses.

(ii) How pox virus DNA replicates in the cytoplasm of infected human cells ?

(iii) Discuss the role of SV40 large T antigen and small t antigen in the infected cells.

(iv) Write the cultivation process of plant virus.

2 + 2 + 2 + 2

[ Internal Assessment — 10 Marks ]

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