

**U.G. 1st Semester Examination - 2020**

**MICROBIOLOGY**

**[HONOURS]**

**Generic Elective Course (GE)**

**Course Code : MB-H-GEL-T-1**

**(Fundamentals and Techniques in Microbiology)**

Full Marks : 40

Time : 2½ 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.*

**Answer all the questions.**

1. Answer any **five** of the following:      2×5=10
  - i) How can filtering be used to determine a bacterial count?
  - ii) How do Koch's postulates prove cause and effect of a disease?
  - iii) How does O<sub>3</sub> act as disinfectant?
  - iv) What is auxochrome and chromophore? Give example.
  - v) What is the carbon source for autotrophs?
  - vi) How do photoautotrophs differ from photoheterotrophs?

- vii) How do aerobes avoid damage by toxic forms of oxygen?
- viii) What is the mode of action of detergents on microorganism?

2. Answer any **two** of the following:      5×2=10
  - i) Discuss different evidences for establishment of theory of endosymbiogenesis.
  - ii) Give short notes on:
    - a) Factors affecting bacterial growth
    - b) Chemostat
  - iii) State the properties of an ideal chemotherapeutic agent. Describe the mode of action of an aminoglycoside antibiotic and sulfa drug.
  - iv) How would you visualise capsule, endospore, and flagella?
3. Answer any **two** of the following:      10×2=20
  - i) Distinguish between a bacteriostatic and a bacteriocidal agent with example. What is the main difference between a sterilant and a disinfectant? Describe mode of action and use of ethanol, formaldehyde and sodium

hypochlorite (a halogen) in controlling microbial growth. 2+2+2+2+2

ii) Briefly describe the work of Pasteur on microbial fermentations. How did Winogradsky contribute to the study of microbial ecology? Briefly describe the five-kingdom system and give the major characteristics of each kingdom. 3+3+4

iii) What are pure cultures, and why are they important? In what way does microbial growth vary within colony? Compare and contrast the Gram stain and the acid fast stain. 2+2+3+3

iv) What are the generation time and mean growth rate constant? How can they be determined from growth data? Describe bacterial growth curve in a closed system. 3+3+4

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