

M. Sc. (BIOTECHNOLOGY) EXAMINATION, 2022

(1st Year, 2nd Semester)

SUBJECT : MICROBIOLOGY

PAPER : MSBT 234

Time : Two hours

Full Marks : 50 (Written 40 + Internal Assessment 10)

Group A

1. Answer *any six* questions [6 x 5 =30]

- (i) What are the major contribution of the following microbiologists: Paul Ehrlich, Charles Laveran, Sir Ronald Ross, Sambhu Nath De, Sir Upendra Nath Brahmachari.
 - (ii) Mention ways to monitor bacterial growth along with the merit and demerit of the methods.
 - (iii) Describe how virus were classified according to their nucleic acid as proposed by Baltimore .
 - (iv) Even E coli has a short-term memory: explain in the light of bacterial chemotaxis.
 - (v) Mention the functions of bacterial (a) Cell wall, (b) Capsule, (c) LPS, (d) pili, and (e) Outer membrane.
 - (vi) Nitrogenase enzyme is usually sensitive to molecular oxygen: Mention how different types of nitrogen fixing bacteria deal with the problem.
 - (vii) Briefly describe the method of sterilization by autoclaving.
 - (viii) Briefly mention how a bacterial strain could be classified. What is its importance?
 - (ix) Briefly mention the role of interferons as antiviral agents.
 - (x) Describe a simple growth curve of bacteria. Why bacterial growth stops after sometime? Mention (by circling) where the antibiotic penicillin would be most effective and why.
 - (xi) Describe, with suitable examples, all the special features of endospore forming bacteria.
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GROUP-B

Answer any two questions [2 x 5 =10]

- 2. Describe some possible effects of endophytic bacteria on plants. List the differences between endophyte and mycorrhizae. (2+3)
- 3. How does commensalism differ from cooperation and mutualism? Nitrification is a good example of which of the above-mentioned process and why. (3+2)

4. What is difference between assimilatory nitrate reduction and denitrification? Which reaction is performed by microbes and which have a more specialized metabolic capacity. (3+2)

5. Explain with examples of the biochemical process carried out by the microorganisms in carbon cycle.