

This question paper contains 2 printed pages]

NY—204—2023

FACULTY OF SCIENCE

M.Sc. (First Year) (Second Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

MICROBIOLOGY

Paper VIII (MB-203)

(Bioprocess Engineering)

(Monday, 11-12-2023)

Time : 10.00 a.m. to 1.00 p.m.

Time—Three Hours

Maximum Marks—75

N.B. :- (i) Attempt All questions.

(ii) All questions carry equal marks.

(iii) Represent your answer with suitable diagrams, scheme and examples wherever necessary.

1. Explain the term bioprocess engineering. Write a note on approach of biologist and engineers towards research. 15

Or

Describe environmental factors affecting growth kinetics. Write a note on batch culture.

2. Define Bioreactor. Explain in detail different types of bioreactor used in industries. 15

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NY—204—2023

Or

Describe in detail features of ideal batch reactor and CSTR. Explain construction and working of fluidized bed bioreactor and trickle bed reactor.

3. What is $k_L a$? Discuss different methods used to determine $k_L a$. 15

Or

Discuss in detail importance of aeration and agitation in mass transfer.

4. Explain the following upstream process and its importance in detail : 15

(a) Inoculum development

(b) Formulation of production media.

Or

Explain downstream processing. Take a detailed account of extraction and isolation of intracellular products.

5. Write short notes on (any *three*) : 15

(i) Mixed culture

(ii) Impellers

(iii) Baffles

(iv) Sterilization of bioreactor

(v) Reverse osmosis.

NY—204—2023

2