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(November)

BIOTECHNOLOGY

(Honours)

(Microbiology and Environmental
Biotechnology)

Marks : 56

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

Answer Question No. **1** which is compulsory and
any **four** from the rest

1. Write briefly on the following :   2×6=12

    (a) John Needham and theory of sponta-
    neous generation

    (b) Methods adopted for sterilization of
    liquids

    (c) Photoautotrophy and microbial nutrition

    (d) Dilution plate and spread plate methods
    of isolation of microbes

(*Turn Over*)

(e) *Bacillus thuringiensis* as a biopestidal agent

(f) Hyperthermophiles and industrial enzymes

2. Write on the different phases observed during the batch culture growth of a bacterium. What is the significance of stationary phase in microbial growth?   9+2=11

3. What are the strategies that can be used for inducing variation in a microbial population? Write briefly on conjugation as a mode of genetic recombination in bacteria.   7+4=11

4. Which categories of microbes are used in conversion of sugars to ethanol? How has improvement in substrate usage assisted in bioethanol production?   5+6=11

5. How do limiting factors influence the distribution of organisms? Write on the Liebig law of minimum in relevance to the limiting factors.   7+4=11

6. What is greenhouse effect? What are the major categories of gases that contribute to greenhouse effect? What are the implications of greehouse effect?   4+3+4=11

7. Write short notes on any *two* of the following :   5½×2=11

(a) Nutritional categories of microorganisms

(b) Symbiotic nitrogen fixers and biofertilizers

(c) Industrial production of penicillin

8. Write briefly on the following :   5½+5½=11

(a) Microbial hydrogen production and its scope as alternate source of energy

(b) Aerobic treatment of municipal wastes

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