Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Sc (H), BT/SEM-5/IBT-504/2009-10

2009
INDUSTRIAL BIOTECHNOLOGY

Time Allotted : 3 Hours | Full Marks : 70

The figures in the margin indicate full marks.

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

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

   i) Single celled protein is also provides
      a) non-essential amino acid
      b) all protein
      c) essential amino acid (lys, met)
      d) no proteins.

   ii) Bubbles are created by spurger and broken by
      a) air b) impeller
      c) both of these d) none of these.

   iii) Penicillin production is an
      a) anaerobic process b) aerobic process
      c) long process d) little oxygen needed.

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iv) Vinegar contains acetic acid in which proportion ?

a) 4% b) 8%

c) 12% d) 34%.

v) Tetracycline is produced by

a) *S. aureus* b) *S. cremoris*

c) *S. mutans* d) *S. aureofaciens.*

vi) Acetic acid is produced by

a) *gluconobacter* b) *clostridium*

c) *lactobacillus* d) none of these.

vii) Disadvantages of immobilized enzyme is

a) stable

b) can be reused again

c) the products are enzyme free

d) loss of biological activity during immobilization.

viii) The plasmoptysis causes

a) loss of protoplasm b) cell swelling

c) cell shrinking d) all of these.

ix) Substances those helps to form foam is

a) antifoaming agent b) alkali

c) glycerine d) collector substance.

x) Intracellular and extracellular product recovery includes all the same steps but intracellular product recovery requires an additional step which is

a) purification b) formulation

c) solid liquid separation d) cell disruption.

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xi) *Psedomonas putida* is used for

a) bioaugmentation b) bioremediation

c) bioleaching d) biopesticides.

xii) Size of the particle separated in ultrafiltration is

a) 0·001 — 1 mm b) 0·02 — 2 μm

c) 0·001 — 10 μm d) 0·001 — 0·1 μm.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) What are the disadvantages of microbial enzyme production ?

   b) How are the alginate beads formed in the process of cross-linking ? $2\frac{1}{2} + 2\frac{1}{2}$

3. Describe the industrial application of immobilized enzymes. 5

4. Write short notes on any *one* of the following :

   a) fluidized bed bioreactor

   b) airlift bioreactor. 5

5. Write the advantages of bioleaching. 5

6. What are the advantages and disadvantages of single cell protein ? $2\frac{1}{2} + 2\frac{1}{2}$

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GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. Describe the methods of improvement of industrially important microbial cultures. What are the different steps of industrial fermented product recovery ? $7\frac{1}{2} + 7\frac{1}{2}$

8. What are the different methods of enzyme immobilization ? Briefly describe each of the methods. What are the specific advantages of enzyme immobilization ? 1 + 9 + 5

9. a) Explain composting and its mechanisms.

   b) What is vermicomposting and its advantages ?

   c) Why are microbes the scavengers in bioremediation

   (give example) ?

   d) What are the four major processes under the tertiary treatment. 5 + 3 + 2 + 5

10. a) Describe the process of monoclonal antibodies by *E.coli*.

    b) How is it important for the treatment of cancer cells ?

    10 + 5

11. a) What is the source of energy in our universe ?

    b) Write a short note on energy rich crops.

    c) Describe the production of Biomethane with proper diagram and biochemical reactions. 2 + 3 + 10

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