2019

B.Sc.

3rd Semester Examination

BIOTECHNOLOGY
(Honours)

Paper - SEC 1-T

Full Marks : 40 Time : 2 Hours

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Industrial Fermentation

1. Answer any *five* questions : 2×5=10

   (a) Write down two microorganisms involved in biogas production. 2

   (b) Name two anticancer agents of microbial origin. 1+1

   (c) What is upstream processing? 2

   (d) What is ion-exchange chromatography? 2

[Turn Over]

(e) Write down the mechanism of action of glucose isomerase. 2

(f) What is solid state fermentation? 2

(g) Mention two applications of microbial poly saccharide. 1+1

(h) What is cell fractionation? 2

2. Answer any *four* questions : 5×4=20

(a) Write down the different components of a CSTR. 5

(b) How can an anaerobic fermentation be done in laboratory? Mention its utility. 3+2

(c) Discuss detailed process for the production of microbial insecticide. 5

(d) Write down the process of steroid transformation along with its application. 3+2

(e) Write, in detail, about the cell immobilization process. 5

(f) Write notes on : (i) microbial flavour and (ii) fragrances. $2\frac{1}{2}+2\frac{1}{2}$

3. Answer any *one* question : 10×1=10

(a) Write, in detail, about scale up in industrial fermentation process. Discuss down stream processing. 6+4

(b) Discuss microbial production of propionic acid. Mention its utility. How are the different microbial enzymes used in organic synthesis? 4+2+4

Enzymology

Answer all questions

1. Answer any *five* questions : 2×5=10

   (a) What is active site for an enzyme? 2

   (b) What are isozymes? 2

   (c) What are ribozymes? 2

   (d) What are enzyme electrodes? 2

   (e) Write down two applications of immobilized enzyme in health science. 1+1

   (f) What are zymogens? 2

   (g) What is the secondary structure of a protein? 2

   (h) Write down the mechanism of action of lysozyme. 2

2. Answer any *four* questions : 5×4=20

   (a) Write down the protein crystallization process. 5

   (b) How does the pH of a medium regulate catalytic efficiency of an enzyme? 5

(c) Write down the different methods for enzyme immobilization. 5

(d) Write down regulation of allosteric enzymes with suitable example. 4+1

(e) Discuss different types of enzyme interactions. 5

(f) How structural motifs can be used to study the function of a protein? 5

3. Answer any *one* question : 10×1=10

(a) Write down different mechanisms of protein folding. How enzyme engineering can be done through site directed mutagenesis? 6+4

(b) Write down different applications of proteases. Discuss different kinds of enzyme inhibition. 5+5