



বিদ্যাসাগর বিশ্ববিদ্যালয়  
VIDYASAGAR UNIVERSITY

Question Paper

**B.Sc. Honours Examinations 2020**

(Under CBCS Pattern)

**Semester - III**

**Subject: BIOTECHNOLOGY**

**Paper : SEC 1-T & SEC 1-P**

**Full Marks : 40 (Theory - 25 + Practical - 15)**

**Time : 2 Hours**

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

*The figures in the margin indicate full marks.*

**Enzymology**

[ Theory ]

**Group - A**

Answer any *one* of the following questions :

1 × 15 = 15

1. (a) What is the mechanism of conversion of a zymogen to an active enzyme? Explain.

(b) How Michaelis Menten equation is derived?

(c) How is free energy related to activation energy?

5+6+4

2. (a) How can do you determine  $K_i$  value of a noncompetitive inhibitor?

(b) Discuss the mechanism of enzyme action.

(c) What is lysozyme and its function?

5+6+4

3. (a) Why allosteric enzymes do not follow the Michaelis-Menten kinetics?
- (b) What does fatty acid synthase do?
- (c) What do you know about ribozyme?

**Group - B**

Answer any **one** of the following questions :

1 × 10 = 10

4. (a) How are enzymes produced in large scales?
- (b) How are immobilized enzymes used in industry? 5+5
5. (a) Write the methods for analysis of secondary and tertiary structures of enzyme.
- (b) How do proteins fold in a few seconds *in vitro*? 5+5

**[ Practical ]**

Answer any **one** of the following questions :

1 × 15 = 15

1. Write the principle and procedure of purification of an enzyme from any natural resource. 5
  2. Write the principle and procedure of quantitative estimation of proteins by Lowry's method. 15
  3. Write the principle and procedure of large scale production of enzyme. 15
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## Industrial Fermentation

### [ Theory ]

#### Group - A

Answer any *one* of the following questions :

1 × 15 = 15

1. Write the process of industrial production of propionic acid and biogas. Write the name of causative organism for industrial production of gluconic acid, ethanol and anticancer drug. (any one) 6+6+3
2. State about different processes of enzyme immobilization. What is secondary metabolite? State their significance. 8+2+5
3. What is upstream processing? In which aspects this is differed from downstream processing? State the effect of pH and temperature on rate of enzymatic reaction. 3+4+(4+4)

#### Group - B

Answer any *one* of the following questions :

1 × 10 = 10

1. Write note on : CSTR and metabolic engineering of antibiotic biosynthetic pathways. 5+5
2. Mention the role of enzymes in food technology. What is scale up? What is microbial flavour? State their significances. 4+2+2+2

### [ Practical ]

Answer any *one* of the following questions :

1 × 15 = 15

1. State the process of calculation of generation time of bacteria. 15
  2. Write the process of determination of activity of amylase or protease. 15
  3. Draw and describe how an continuous fermenter works. 15
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