Seat No. : _____

NH-120

November-2025

B.Sc., Sem.-V

DSC-M-BT-354 (T) : Biotechnology

(Enzyme Technology)

Time : 2:00 Hours] **[Max. Marks : 50**

1. Explain the Michaelis-Menten equation. Derive the equation and discuss the significance of Km and Vmax. **10**

OR

1. (a) Describe the classification and nomenclature of enzymes with suitable examples. **5**

1. (b) What are Enzyme Activity Unit, Specific Activity, and Turnover Number ? Explain their importance in enzyme kinetics. **5**

2. Explain the mechanism of enzyme inhibition with suitable diagrams and examples of competitive, non-competitive, and uncompetitive inhibition. **10**

OR

2. (a) Write short notes on Lock and Key model and Induced Fit model of enzyme catalysis. **5**

2. (b) What are Isoenzymes ? Explain Lactate Dehydrogenase (LDH) as an example. **5**

3. Describe the production process of Fungal Amylase and Taq Polymerase including culture, medium, process, and recovery steps. **10**

OR

3. (a) Explain the methods used for purification of proteins based on size, mass, polarity, solubility, and specificity. **5**

3. (b) Discuss the industrial uses and market potential of enzymes in biotechnology. **5**

4. Explain in detail the techniques of enzyme immobilization and discuss its applications in biotechnology. **10**

OR

4. (a) What are Biosensors ? Discuss with suitable commercial examples. **5**

4. (b) What is Protein Engineering ? Explain the methods used for enzyme modification. **5**

5. Attempt any **ten** out of **twelve** : **10**

(1) What is the basic structural component of an enzyme ?

(2) Define enzyme specificity.

(3) What does Km represent in enzyme kinetics ?

(4) Name the two models explaining enzyme catalysis.

(5) What type of inhibition can be reversed by increasing substrate concentration ?

(6) Name any one coenzyme derived from Vitamin B complex.

(7) Give one example of an isoenzyme.

(8) What is the function of homogenization in protein extraction ?

(9) Name one industrial enzyme and its source organism.

(10) What is enzyme immobilization ?

(11) Give one example of a biosensor and its application.

(12) What is meant by abzymes ?
