

2203001107030002
EXAMINATION NOVEMBER 2024
MASTER OF SCIENCE (BIOTECHNOLOGY)
SEVENTH SEMESTER
ENZYME BIOTECHNOLOGY - LEVEL 3

[Time: As Per Schedule]

[Max. Marks:70]

Instructions:

1. Fill up strictly the following details on your answer book

- a. Name of the Examination : **MASTER OF SCIENCE (BIOTECHNOLOGY) SEVENTH SEMESTER**
 - b. Name of the Subject : **ENZYME BIOTECHNOLOGY - LEVEL 3**
 - c. Subject Code No : **2203001107030002**
2. Sketch neat and labelled diagram wherever necessary.
 3. Figures to the right indicate full marks of the question.
 4. All questions are compulsory.

Seat No:

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Student's Signature

Q.1 Explain in detail Any Two:

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- (a) You have purified amylase using chromatography. The protein estimated by Folin Lowry method was $30\mu\text{g/ml}$. The enzyme assay was performed by mixing 1ml of enzyme with starch and incubation was carried out at 37°C for 30 mins. Using DNSA method, the amount of reducing sugar released was estimated to be $6000\mu\text{moles}$.
 - i) Units of enzyme.
 - ii) Katal.
 - iii) Total number of product molecules formed.
 - iv) Turnover number (MW of enzyme is 45KD)
- (b) If $2000\mu\text{moles}$ of substrate got converted into product, in 20mins. Calculate the following:-
 - i) Units of enzyme.
 - ii) Katal.
 - iii) Total number of product molecules formed.
 - iv) Turnover number (MW of enzyme is 25KD)
- (c) Explain affinity chromatography and His-Tag method for purification of enzyme.

Q.2 Explain in detail Any Two

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- (a) Define Steady state kinetics? How it is used to derive Michaelis Menten equation?
- (b) What competitive inhibitor? Give examples of competitive inhibitors used in medical field.
- (c) If the substrate concentration for the enzyme catalyzed is equal to :-
 - i) $2K_M$ ii) $3K_M$ iii) $0.5 K_M$ iv) $25\% K_M$
 - v) $10\% K_M$,calculate the respective values of V_0

Q.3 Explain in detail Any Two:

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- (a) Enlist the enzymes are present in Liver. How will you analyze these enzymes as markers for liver damage?
- (b) Explain reaction, localization and isoforms of Lactate dehydrogenase enzyme.
- (c) What is Heart attack. Which enzymes are used to remove blood clots during heart attack.

Q.4 Explain in detail Any Two:

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- (a) Random mutagenesis and site directed mutagenesis for enzyme engineering.
- (b) Write a short note on Biosensors.
- (c) Bioreactors for industrial production of enzymes
