

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST -3 EXAMINATION-2022

B.Tech-VII Semester (BT)

COURSE CODE (CREDITS): 18B1WBT733 (3)

MAX. MARKS: 35

COURSE NAME: Industrial Enzymes Technologies

COURSE INSTRUCTORS: Dr. Saurabh Bansal

MAX. TIME: 2 Hours

*Note: All questions are compulsory. Marks are indicated against each question in square brackets.  
Write your answer to the point with appropriate diagrams.*

[CO I]

- Q1. a) How is an enzyme different from a chemical (inorganic) catalyst? [2]  
b) How is the rate of an enzyme-catalyzed reaction affected by the temperature and pH of the system? What are the major reasons for the same? [4]  
c) An enzyme preparation has a specific activity of 6.3 Units/mg protein and contains 18 mg proteins/ml. Calculate the initial velocity of the reaction in a standard 1 ml reaction mixture containing 20  $\mu$ l of the preparation. [2]
- Q2. Determine the subunit composition of a protein from the following information with proper justification: [2]  
Molecular mass by gel filtration: 200 kDa,  
Molecular mass by SDS-PAGE w/o BetaME: 100 kDa  
Molecular mass by SDS-PAGE w BetaME: 40 kDa and 60 kDa.

[CO II, III]

- Q3. a) How will you deduce that serine is one of the critical amino acid residues for chymotrypsin activity? [2]  
b) DNase is a metalloenzyme. How will you prove the same in your laboratory? [2]
- Q4. What do you understand by suicide inhibitor? Explain the role of TPCK as a suicide inhibitor. [2]
- Q5. a) Which enzyme is used in the biobleaching of 'Kraft pulp'? [1]  
b) How uricase is helpful in the treatment of the uric acid problem? [2]

[CO IV]

- Q6. a) What are the major limitations of the free enzyme usage in industries? [2]  
b) List the name of different methods of enzyme immobilization. What are the major limitations of enzyme immobilization? [3]

[CO V, VI]

Q7. a) What do you understand by ribozymes? How are they different from enzymes? [3]

b) What are abzymes? What are their potential applications? Explain with one suitable example of its application. [4]

Q8. Differentiate between the following: [4]

a) Group I and group II introns.

b) Rational Design and Directed evolution (Non-rational) approach of protein engineering

Examination December 2022