



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/M.TECH (FT)/SEM-2/PGFT-205 B/2012**

**2012**

**ADVANCED ENZYME ENGINEERING &  
TECHNOLOGY**

*Time Allotted : 3 Hours*

*Full Marks : 70*

*The figures in the margin indicate full marks.*

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

**GROUP – A**

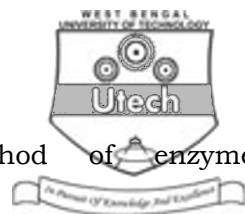
**( Short Answer Type Questions )**

Answer any *five* of the following.  $5 \times 2 = 10$

1. Why Pen-G shows its biological inactivity against acid or alkali ?
2. Though penicillin and cephalosporin are  $\beta$ -lactum antibiotics but differ in their antimicrobial Spectrum-justify.
3. Cite one example of enzyme inhibitor and state its mode of action.
4. What do you understand by genetically engineered enzyme ?
5. What is rennin ? Mention the names of microbial sources of alkaline proteases.
6. Cite two important limitations of enzyme immobilization technology.

30265(M.Tech)

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7. What is micro encapsulation method of enzyme immobilization ?
8. Mention only the steps of lipase production from microbial sources.

### GROUP – B

#### ( Long Answer Type Questions )

Answer any *five* of the following.  $5 \times 12 = 60$

9. What are the processes of biomass conversion to energy ?  
How can you justify the energy production in terms of biofuel by the utilization of solid waste coming from an ideal dairy firm ?  $3 + 9$
10. Briefly discuss the therapeutic applications of enzyme. State the action of immobilized enzyme on Pen-G. How advancement of enzyme engineering is facilitated by design strategy and mutagenesis ?  $6 + 2 + 4$
11. Discuss the penicillin production strategy by indicating medium composition, fermentation Condition and recovery of crystalline Pen-G. Discuss the antimicrobial activity of antibiotics against human pathogens.  $6 + 6$
12. What is biosensor ? Discuss one important type of biosensor by indicating its working principle, design consideration and mechanism of function. Give some potential applications of biosensor.  $1 + 7 + 4$



13. What are amylases ? Discuss the microbial production of alpha-amylases. What are the important uses of alpha-amylases ?  
2 + 7 + 3
14. What do you understand by stability of enzyme ? What are the basic methods of enzyme stabilization ? Discuss the process of enzyme stabilization by immobilization techniques.  
2 + 2 + 8
15. How enzymes are extracted and separated from microbial cells ? Discuss the different methods of purification of enzyme. Mention some major uses of enzyme in food processing.  
3 + 7 + 2
16. Discuss the Michaelis-Menten kinetics for enzyme reaction. What is  $K_m$  and  $V_m$  ? What do you understand by unit of enzyme ? Calculate the value of  $K_m$  and  $V_m$  from the following datas on enzymatic hydrolysis of starch.

3 + 1 + 1 + 7

Substrate concentration (mg/ml)	Relative hydrolysis velocity
12.56	101
11.24	98.2
9.00	92.4
8.12	90.0
6.33	82.7
5.61	79.1
4.28	70.9
3.56	65.0
2.34	51.7
1.00	28.8