

24/05/2016

BE/VIII/CBAS/CHEM./BT  
QP Code : 720601

( 3 Hours)

[ Total Marks : 80

- N.B.: (1) Question No.1 is compulsory.  
(2) Attempt any three out of five questions.  
(3) Assume suitable data wherever required.  
(4) Draw suitable diagram wherever required.

1. Write short notes on (any four)

- i) Reverse Osmosis
- ii) Potential Laboratory bio-hazards
- iii) Ultra and Micro-filtration
- iv) Electrophoresis
- v) DNA recombinant technology
- vi) Crystallization and drying

2. (a) Write a note on nucleic acids. 10  
(b) Explain the different stages involved in the microbial growth. 10
3. (a) State the classification of microbes. Distinguish between prokaryotic and eukaryotic cells. 10  
(b) Write in brief about biological polymers. Cite difference between macro and micronutrients. 10
4. (a) The following data was obtained for the reaction,  $A \rightleftharpoons B$  catalyzed by the enzyme Aase. The reaction volume was 1ml and the stock concentration of A was 5mM. Seven separate reactions were examined, each containing a different amount of A. The reactions were initiated by adding 2 $\mu$ l of a 10 $\mu$ M solution of Aase. After 5 minutes, the amount of B was measured. 15

Reaction	Volume of A added	Amount of B present of 5 minutes (nmoles)
1	08	26
2	10	29
3	15	39
4	20	43
5	40	56
6	60	62
7	100	71

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- 2 -

- (i) Derive Michaelis - Menten Kinetics for rapid equilibrium.  
(ii) Calculate the initial velocity of each reaction ( $\mu\text{Mmin}^{-1}$ )  
(iii) Determine  $K_m$  and  $V_{max}$  of Aase from a Lineweaver Burk plot or any other.
- (b) Write in brief the industrial applications of enzymes.
5. (a) Explain how large scale animal cells can be used for production of monoclonal antibodies. **10**  
(b) What do you understand by protoplast and cell fusion technologies, elaborate. **10**
6. (a) Explain the applications of biotechnology in the following sectors (any 2) **10**  
i) Agriculture ii) Food and beverage  
iii) Chemical iv) Environment  
(b) What do you understand by genetic engineering, explain gene therapy in great detail. **10**

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MUMBAI HADOMAI SHAIKHI ENGINEERING COLLEGE, BANDRA 24.05.2016