



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/M.TECH(BT)IntPhD Mol.Bio./Micro.Bio./  
SEM-1/MBT/PHMC/PHMB-101/2011-12**

**2011**

**MICROBIAL BIOCHEMISTRY**

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.*

Answer Question No. 1 which is compulsory and any six from the rest.

1. a) Define a psychrophile.
- b) "Enzymes are superior to chemical catalyst." Comment.
- c) What is casein ?
- d) Differentiate between tropophase and idiophase.
- e) Calcium alginate is a glucopolymer. State True or False.
- f) "Pasteurization is not sterilization." Comment.
- g) Name the enzyme involved in oxidation of luciferin to oxiluciferin.
- h) Write the difference between glycosidase and transpeptidase.
- i) What is forward and reverse genetics ?
- j) Secondary metabolites are not essential to the producing organism. State True or False. 10 × 1



2. a) Define enzyme protein / enzyme engineering.  
b) Write the steps of enzyme engineering in detail.  
c) What are the different methods of enzyme / protein modification ? Which one you prefer and why ? 1 + 5 + 4
3. a) Describe the method of oligonucleotide directed mutagenesis by diagram only.  
b) Describe a strategy for increasing stability of a protein that has  
i) no cystein residue  
ii) an odd number of cystein residue. 5 + 5
4. a) Describe the method with example how you eliminate the cofactor requirement of an enzyme by enzyme engineering ?  
b) Describe the method with example how you can improve the protease resistance of an enzyme. 5 + 5
5. a) Write the strategy to isolate a  $\beta$ -lactamase-free penicillin acylase producing microbes.  
b) Describe the protocols for purification of an enzyme.  
c) What are isozymes ? 3 + 5 + 2
6. a) " $\beta$ -amylase cannot be assayed directly." Comment.  
b) Name the enzyme involved in conversion of glucose to fructose.  
c) Why invert sugar is more sweet than table sugar ?  
6 + 1 + 3



7. a) What is the difference between impeller and baffle in a fermenter ?
- b) "The upstream processing in batch and continuous fermentation is same." Comment.
- c) Ultrafiltration is involved in upstream processing of fermentation. State True or False.
- d) Write the equation of heat exchange during fermentation. 3 + 4 + 1 + 2
8. a) Describe the difference between biotransformation and biodegradation by microbe.
- b) Write steps involved in degradation of a haloaromatic insecticide by microbe.
- c) Write the method in detail, used for screening mutagens. 2 + 5 + 3

