

Bioprocess Engineering
Principles of enzyme catalysis
2 Marks

1. Define enzyme?
2. Why enzymes are called as proteins?
3. Who discovered enzymes?
4. Define catalysis?
5. Why enzymes are called biocatalyst?
6. What is michelis Menton constant?
7. Define reaction inhibition.
8. Define association constant.
9. Define dissociation constant.
10. Define rate constant.
11. Give examples of some commercially used enzymes?
12. Which enzymes are commonly used in bakery industries?
13. What do you mean by amphoteric nature of enzymes?
14. Define zwitterion.
15. Name some fungal and bacterial species mostly used for the production of proteases.
16. List of some industrial enzymes?
17. Define V_{max} .
18. Define K_m .
19. Define inducer in an enzyme catalysed reaction?
20. Define repressor in an enzyme catalysed reaction?

5 Marks

1. What are the advantages of choosing an enzyme as a catalyst?
2. Write about effect of pH on enzymes?
3. Write about effect of temperature on enzymes?
4. Write a short note on catalyst?
5. Define enzymes as proteins?
6. Why enzymes are called biocatalyst?
7. Define catalysis and what are the types of catalysis?
8. Write a short note on enzymes?

7 Marks

1. Define Proteins? write about the classification of proteins?
2. Write about some evidence proving enzymes are proteins?
3. What is enzymes kinetics? How it is related to the rate of reaction?
4. Derive Michelis menton equation on enzyme catalysed reaction?
5. Write about the application of enzymes in different commercial fields?

Microbial growth
2 Marks

1. Write about the different sources of enzymes?
2. What are animal enzymes?
3. What are plant enzymes?

4. What are microbial enzymes?
5. Write about the location of enzyme in cell?
6. Define mass balance.
7. Define energy balance.
8. What are the factors affecting microbial growth?
9. Define growth kinetics?
10. What is the most favourable source for enzyme extraction?
11. What is doubling time?
12. Write about the selection of microorganisms for enzyme production?
13. How is measurement of growth done?
14. What is a bacteriological incubator?
15. Which medium is used for the growth of microbes.

5 Marks

1. What is growth kinetics? Derive the relation between growth kinetics and P^H concentration?
2. What is optimum temperature? Write down the effect of temperature? Write down the effect of temperature on microbial growth?
3. What is the necessity of mass balance in microbial growth?
4. Define energy balance? Write about the advantages of energy balance?
5. Write about the regulation of microbial growth kinetics?

7 Marks

1. How is microbial growth measured? Write about the process briefly?
2. Describe about the different factors affecting the microbial growth kinetics?
3. Write about the regulation of growth kinetics?

Introduction to Bioprocessing chapter-3 2 Marks

1. Give some examples of substrates involved in bioconversion process?
2. What is sterilization?
3. Define an incubator?
4. What is a culture media?
5. What is aseptic conduction?
6. Define media design?
7. Define bioreaction?
8. What is upstream processing?
9. What is downstream processing?
10. Write down different types of bioreactors?
11. What is the difference between synthetic and crude media?
12. Define batch culture?
13. Define continuous culture.
14. What are the essential conditions for scale up?
15. Name the basic steps involved in downstream processing?
16. Write the names of different incubators?

17. What is animal cell culture?

5 Marks

1. Briefly explain the various phases of batch culture?
2. What is downstream processing? Write down the steps involved in it?
3. Write the classification of bioreactors?
4. Write about the scale up process?
5. Explain about the growth kinetics microorganisations?

7 Marks

1. Write about the media for the fermentation process?
2. Explain about conventional bioreactor with a diagram?
3. What is bioreactor? Briefly explain the process involved with labelled diagram?
4. What is down stream processing? Describe briefly the steps involved in product recovery?
5. Describe about the minimal requirement for cell culture?
6. Describe about the culture media? What are the compounds required for it?

Chapter-4

Process technology for production of primary metabolites

2 Marks

1. What is the biological name of yeast?
2. Why yeast is used for alcoholic fermentation?
3. What is the nutrient substrate used for the growth of yeast ?
4. What is fermentation?
5. What are the alcoholic beverages obtained from alcoholic fermentation?
6. What are the applications of commercially synthesized amino acids?
7. Which are the most widely synthesized amino acids commercially?
8. What is MSG?
9. Which amino acids are generally more appropriate for commercial use?
10. Which microbial strain is used for synthesis of citric acid commercially?

5 Marks

1. Briefly explain fermentation?
2. What is maturation? Briefly explain ?
3. What are the different factors that effect the growth of micro organism?
4. What is harvesting?
5. What are metabolites ? Write about different types of metabolites?

7 Marks

1. Explain the production of bakers yeast?
2. How citric acid is synthetically produced? Describe the process involved in it?
3. How amino acid are commercially produced ?
4. What is the process of manufacturing alcohol?

Chapter-5 Microbial production of industrial enzymes

2 Marks

1. What are the different types of enzymes produced commercially?
2. What is the use of enzyme amylase?
3. What is the use enzyme glutamic isomerase?
4. What is the use of enzyme cellulase?
5. What is the use of enzyme lipase?
6. What is the use of enzyme protease?

5 Marks

1. Write briefly the process of the enzyme production process?
2. What are different enzymes that produced synthetically? Write about the uses?

7 Marks

1. Why synthetic enzyme production is necessary?

Chapter-6

Production of secondary metabolites

2 Marks

1. What is penicillin?
2. Define antibiotic?
3. What is broad spectrum antibiotic?
4. what is narrow spectrum antibiotic?
5. What is SCP?
6. What is vitamin?
7. What is primary metabolites?
8. What is secondary metabolites?
9. Give some examples of antibiotics?
10. Give some examples of SCP?

5 Marks

1. What is Vitamin? Write about different types of Vitamins?
2. Write Short note on SCP?
3. Briefly write about antibiotics?
4. Write a short note on SCP?
5. Write the application of different vitamins?

7 Marks

1. What are antibiotics? Write about different antibiotics used?
2. Write about different types of vitamins and their applications?

Chapter-7

Industrial process and process economics

7 Marks

1. What is industrial process? Describe briefly?
2. What is process economics? write about advantages and disadvantages?