

Code No: RR410807

RR

Set No. 2

IV B.Tech I Semester Examinations, NOVEMBER 2010

BIO CHEMICAL ENGINEERING

Chemical Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the following continuous sterilizer designs with a schematic diagram:
 - i. Direct heating using steam injection
 - ii. Indirect heating using plate heat exchangers.
- (b) Discuss the several advantages of continuous sterilization and also mention its drawbacks. [5+5+6]
2. (a) What are spirilla, cocci and bacilli? Draw a neat diagram to represent them.
- (b) What are procaryotes? Describe their general characteristics with a neat sketch.
- (c) What is the difference between mitochondria and chloroplast? [6+6+4]
3. (a) Competitive, noncompetitive and mixed inhibitions can be easily distinguished in a Lineweaver-Burk plot. Explain how this can be done with the help of neat figures. What is the effect on v_{max} and K_m values for these types of inhibitions?
- (b) Explain in detail allosteric control and substrate analogs. [8+8]
4. (a) List the factors motivating the development of new types of bioreactors.
- (b) Give a brief account of alternate bioreactor configuration. [8+8]
5. Discuss in detail about the different means of transport across cell membranes. [16]
6. (a) Eadie (1942) measured the initial reaction rate of hydrolysis of acetyl-choline (substrate) by dog serum (source of enzyme) and obtained the following data:

Substrate concentration mmol/L	Initial reaction rate mmol/L min
0.0032	0.111
0.0049	0.148
0.0062	0.143
0.0080	0.166
0.0095	0.200

Evaluate the Michealis-Menten kinetic parameters by employing the Lineweaver-Burk plot.

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- (b) Briefly discuss the other two methods for estimating the Michealis-Menten parameters. [12+4]
7. Briefly describe the industrial process employing immobilized enzyme catalyst for the production of L-amino acids by resolution of racemic amino acid mixtures with a neat flow diagram. Give the reaction involved. [16]
8. With the help of typical growth curve, discuss in detail growth cycle phases for batch cultivation and suggest ways of reducing lag times. [16]

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Set No. 4

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BIO CHEMICAL ENGINEERING

Chemical Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

- Briefly describe the industrial process employing immobilized enzyme catalyst for the production of L-amino acids by resolution of racemic amino acid mixtures with a neat flow diagram. Give the reaction involved. [16]
- With the help of typical growth curve, discuss in detail growth cycle phases for batch cultivation and suggest ways of reducing lag times. [16]
- Competitive, noncompetitive and mixed inhibitions can be easily distinguished in a Lineweaver-Burk plot. Explain how this can be done with the help of neat figures. What is the effect on v_{max} and K_m values for these types of inhibitions?
 - Explain in detail allosteric control and substrate analogs. [8+8]
- What are spirilla, cocci and bacilli? Draw a neat diagram to represent them.
 - What are procaryotes? Describe their general characteristics with a neat sketch.
 - What is the difference between mitochondria and chloroplast? [6+6+4]
- List the factors motivating the development of new types of bioreactors.
 - Give a brief account of alternate bioreactor configuration. [8+8]
- Eadie (1942) measured the initial reaction rate of hydrolysis of acetyl-choline (substrate) by dog serum (source of enzyme) and obtained the following data:

Substrate concentration mmol/L	Initial reaction rate mmol/L min
0.0032	0.111
0.0049	0.148
0.0062	0.143
0.0080	0.166
0.0095	0.200

Evaluate the Michealis-Menten kinetic parameters by employing the Lineweaver-Burk plot.

- Briefly discuss the other two methods for estimating the Michealis-Menten parameters. [12+4]

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Set No. 4

7. (a) Explain the following continuous sterilizer designs with a schematic diagram:
- i. Direct heating using steam injection
 - ii. Indirect heating using plate heat exchangers.
- (b) Discuss the several advantages of continuous sterilization and also mention its drawbacks. [5+5+6]
8. Discuss in detail about the different means of transport across cell membranes.[16]

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Set No. 1

IV B.Tech I Semester Examinations, NOVEMBER 2010

BIO CHEMICAL ENGINEERING

Chemical Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

- Briefly describe the industrial process employing immobilized enzyme catalyst for the production of L-amino acids by resolution of racemic amino acid mixtures with a neat flow diagram. Give the reaction involved. [16]
- What are spirilla, cocci and bacilli? Draw a neat diagram to represent them.
 - What are procaryotes? Describe their general characteristics with a neat sketch.
 - What is the difference between mitochondria and chloroplast? [6+6+4]
- With the help of typical growth curve, discuss in detail growth cycle phases for batch cultivation and suggest ways of reducing lag times. [16]
- Eadie (1942) measured the initial reaction rate of hydrolysis of acetyl-choline (substrate) by dog serum (source of enzyme) and obtained the following data:

Substrate concentration mmol/L	Initial reaction rate mmol/L min
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0.0062	0.143
0.0080	0.166
0.0095	0.200

Evaluate the Michealis-Menten kinetic parameters by employing the Lineweaver-Burk plot.

- Briefly discuss the other two methods for estimating the Michealis-Menten parameters. [12+4]
- Explain the following continuous sterilizer designs with a schematic diagram:
 - Direct heating using steam injection
 - Indirect heating using plate heat exchangers.
 - Discuss the several advantages of continuous sterilization and also mention its drawbacks. [5+5+6]
 - List the factors motivating the development of new types of bioreactors.

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Set No. 1

- (b) Give a brief account of alternate bioreactor configuration. [8+8]
7. Discuss in detail about the different means of transport across cell membranes. [16]
8. (a) Competitive, noncompetitive and mixed inhibitions can be easily distinguished in a Lineweaver-Burk plot. Explain how this can be done with the help of neat figures. What is the effect on v_{max} and K_m values for these types of inhibitions?
- (b) Explain in detail allosteric control and substrate analogs. [8+8]

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Set No. 3

IV B.Tech I Semester Examinations, NOVEMBER 2010

BIO CHEMICAL ENGINEERING

Chemical Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

- What are spirilla, cocci and bacilli? Draw a neat diagram to represent them.
 - What are procaryotes? Describe their general characteristics with a neat sketch.
 - What is the difference between mitochondria and chloroplast? [6+6+4]
- List the factors motivating the development of new types of bioreactors.
 - Give a brief account of alternate bioreactor configuration. [8+8]
- Competitive, noncompetitive and mixed inhibitions can be easily distinguished in a Lineweaver-Burk plot. Explain how this can be done with the help of neat figures. What is the effect on v_{max} and K_m values for these types of inhibitions?
 - Explain in detail allosteric control and substrate analogs. [8+8]
- Discuss in detail about the different means of transport across cell membranes. [16]
- Eadie (1942) measured the initial reaction rate of hydrolysis of acetyl-choline (substrate) by dog serum (source of enzyme) and obtained the following data:

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0.0095	0.200

Evaluate the Michealis-Menten kinetic parameters by employing the Lineweaver-Burk plot.

- Briefly discuss the other two methods for estimating the Michealis-Menten parameters. [12+4]
- With the help of typical growth curve, discuss in detail growth cycle phases for batch cultivation and suggest ways of reducing lag times. [16]

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7. Briefly describe the industrial process employing immobilized enzyme catalyst for the production of L-amino acids by resolution of racemic amino acid mixtures with a neat flow diagram. Give the reaction involved. [16]
8. (a) Explain the following continuous sterilizer designs with a schematic diagram:
- i. Direct heating using steam injection
 - ii. Indirect heating using plate heat exchangers.
- (b) Discuss the several advantages of continuous sterilization and also mention its drawbacks. [5+5+6]

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