Code No: RR222302 **Set No. 1**

II B.Tech II Semester Supplementary Examinations,
November/December 2005
BIO PROCESS ENGINEERING-I
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Mention about the Regulatory constraints of bioprocesses. 16 [6+10]
2. What is meant by solid state fermentation? Explain the industrial application of solid state fermentation indicating the microorganisms, substrates and products. [6+10]
3. Explain the factors to be considered for developing medium for animal cell culture. [16]
4. (a) Explain reactions involved that lead to loss of nutrient quality during sterilisation. [8]
   (b) Describe methods of batch sterilisation. [8]
5. Discuss in detail the stoichiometry of the product formation with an example [16]
6. Explain the following:
   (a) Control sites in metabolism [8]
   (b) Transfer of bioenergy via ATP [8]
7. (a) Enumerate the principle involved in the microbial growth taking an example [8]
   (b) Differentiate between the growth in the batch and continuos systems [8]
8. Discuss in details the product kinetics associated with growth with appropriate examples. [16]

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Code No: RR222302 **Set No. 2**

II B.Tech II Semester Supplementary Examinations,
November/December 2005
BIO PROCESS ENGINEERING-I
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Mention about the Regulatory constraints of bioprocesses. 16 [6+10]

2. (a) What is meant by immobilisation of cells? What are the advantages of immobilised cell culture over suspension cell culture? [2+4]
   (b) What is active immobilisation? Explain various matrices used for active immobilisation. [2+4]
   (c) Describe the methods employed for active cell immobilisation. [4]

3. (a) Describe the use of antifoam in industrial fermentation indicating the principle. [8]
   (b) Give examples of antifoam agents used in fermentation industry. [8]

4. (a) What are the advantages of continuous sterilisation. [8]
   (b) What are the advantages of batch sterilisation. [8]

5. Enumerate the difference between the stoichiometry of cell growth and product formation. [16]

6. (a) Discuss the role of control sites in aerobic glucose metabolism [8]
   (b) Oxygen consumption and heat evolution in aerobic cultures [8]

7. (a) Enumerate the principle involved in the microbial growth taking an example [8]
   (b) Differentiate between the growth in the batch and continuos systems [8]

8. Enumerate the difference between
   (a) Substrate and product inhibition [8]
   (b) Aerobic and anaerobic product formation [8]

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Code No: RR222302 **Set No. 3**

II B.Tech II Semester Supplementary Examinations,
November/December 2005
BIO PROCESS ENGINEERING-I
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Mention about the Regulatory constraints of bioprocesses. 16 [6+10]
2. (a) What is aseptic operation and containment? [4]
   (b) Describe a typical aseptic, aerobic fermentation process. [4]
   (c) What is sparger? Describe different spargers used in fermentors. [2+6]
3. Explain the factors to be considered for developing medium for animal cell culture. [16]
4. (a) What are the advantages of continuous sterilisation. [8]
   (b) What are the advantages of batch sterilisation. [8]
5. Enumerate the difference between the stoichiometry of cell growth and product formation. [16]
6. Enumerate the aerobic catabolism of glucose with emphasis on energetics [16]
7. Explain the role of following parameters on growth kinetics
   (a) Temperature [5]
   (b) Dissolved Oxygen [6]
   (c) pH [5]
8. Explain the optimum environmental conditions required for growth and product formation [16]

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Code No: RR222302 **Set No. 4**

II B.Tech II Semester Supplementary Examinations,
November/December 2005
BIO PROCESS ENGINEERING-I
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Discuss in detail about microbial metabolites. 16 [4+12]
2. (a) What is aseptic operation and containment? [4]
   (b) Describe a typical aseptic, aerobic fermentation process. [4]
   (c) What is sparger? Describe different spargers used in fermentors. [2+6]
3. Give the composition of four industrially important media used in industrial fermentation. [16]
4. Explain the kinetics of medium sterilisation and obtain a mathematical expression for specific death rate. [16]
5. Explain in detail the stoichiometry involved in the cell growth and product formation. [16]
6. Differentiate the heterotrophic and autotrophic metabolism emphasis on energetics. [16]
7. (a) Enumerate the principle involved in the microbial growth taking an example [8]
   (b) Differentiate between the growth in the batch and continuos systems [8]
8. Explain the concept of product formation in bioprocess engineering with appropriate examples [16]

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