Code No: R05212306 **R05** **Set No. 2**

II B.Tech I Semester Examinations,November 2010
TRANSPORT PHENOMENA IN BIO PROCESS
Bio-Technology

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

Answer any FIVE Questions
All Questions carry equal marks

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1. The oxygen demand varies with time in a batch fermenter. Explain with the help of figure. [16]

2. (a) Draw the temperature profile for control of fermentation temperature using cooling water.
   (b) Draw the following equipment for heat exchange:
      i. internal baffle type coil
      ii. external heat exchange. [8+8]

3. (a) Sketch the concentration profile for oxygen stripping and absorption method for measurement of K_La by dynamic gassing out method.
   (b) Describe the procedure to determine K_La experimentally using dynamic gassing out method. [8+8]

4. Derive the expression to calculate rate of heat flow through composite plane walls. [16]

5. (a) Write the units of diffusivity.
   (b) Sketch the concentration profile for film theory and state the assumptions.
   (c) What is gas film controlling and liquid film controlling in mass transfer. [2+6+8]

6. Write short notes on
   (a) Cell concentration
   (b) Product and substrate concentration
   (c) Mixing [5+5+6]

7. (a) Explain Reynold's experiment and mention the different flow regions.
   (b) The density of the fluid flowing through a pipe is 900 kg $/m^3$. The kinematic viscosity is $6\times10^{-6}m^2/s$. Calculate the dynamic viscosity in kg/m-s.
   (c) Write the different units of viscosity. [5+8+3]

8. Discuss the parameters on which the mixing power for non aerated fluids depend. [16]

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Code No: R05212306 **R05** **Set No. 4**

II B.Tech I Semester Examinations,November 2010
TRANSPORT PHENOMENA IN BIO PROCESS
Bio-Technology

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Derive the expression to calculate rate of heat flow through composite plane walls. [16]

2. (a) Sketch the concentration profile for oxygen stripping and absorption method for measurement of K_La by dynamic gassing out method.
   (b) Describe the procedure to determine K_La experimentally using dynamic gassing out method. [8+8]

3. The oxygen demand varies with time in a batch fermenter. Explain with the help of figure. [16]

4. (a) Write the units of diffusivity.
   (b) Sketch the concentration profile for film theory and state the assumptions.
   (c) What is gas film controlling and liquid film controlling in mass transfer. [2+6+8]

5. (a) Draw the temperature profile for control of fermentation temperature using cooling water.
   (b) Draw the following equipment for heat exchange:
      i. internal baffle type coil
      ii. external heat exchange. [8+8]

6. Discuss the parameters on which the mixing power for non aerated fluids depend. [16]

7. (a) Explain Reynold's experiment and mention the different flow regions.
   (b) The density of the fluid flowing through a pipe is 900 kg $/m^3$. The kinematic viscosity is $6\times10^{-6}m^2/s$. Calculate the dynamic viscosity in kg/m-s.
   (c) Write the different units of viscosity. [5+8+3]

8. Write short notes on
   (a) Cell concentration
   (b) Product and substrate concentration
   (c) Mixing [5+5+6]

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Code No: R05212306 **R05** **Set No. 1**

II B.Tech I Semester Examinations,November 2010
TRANSPORT PHENOMENA IN BIO PROCESS
Bio-Technology

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Write short notes on
   (a) Cell concentration
   (b) Product and substrate concentration
   (c) Mixing [5+5+6]
2. The oxygen demand varies with time in a batch fermenter. Explain with the help of figure. [16]
3. Derive the expression to calculate rate of heat flow through composite plane walls. [16]
4. (a) Write the units of diffusivity.
   (b) Sketch the concentration profile for film theory and state the assumptions.
   (c) What is gas film controlling and liquid film controlling in mass transfer. [2+6+8]
5. (a) Draw the temperature profile for control of fermentation temperature using cooling water.
   (b) Draw the following equipment for heat exchange:
      i. internal baffle type coil
      ii. external heat exchange. [8+8]
6. (a) Sketch the concentration profile for oxygen stripping and absorption method for measurement of K_La by dynamic gassing out method.
   (b) Describe the procedure to determine K_La experimentally using dynamic gassing out method. [8+8]
7. Discuss the parameters on which the mixing power for non aerated fluids depend. [16]
8. (a) Explain Reynold's experiment and mention the different flow regions.
   (b) The density of the fluid flowing through a pipe is 900 kg $/m^3$. The kinematic viscosity is $6\times10^{-6}m^2/s$. Calculate the dynamic viscosity in kg/m-s.
   (c) Write the different units of viscosity. [5+8+3]

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Code No: R05212306 **R05** **Set No. 3**

II B.Tech I Semester Examinations,November 2010
TRANSPORT PHENOMENA IN BIO PROCESS
Bio-Technology

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain Reynold's experiment and mention the different flow regions.
   (b) The density of the fluid flowing through a pipe is 900 kg $/m^3$. The kinematic viscosity is $6\times10^{-6}m^2/s$. Calculate the dynamic viscosity in kg/m-s.
   (c) Write the different units of viscosity. [5+8+3]
2. (a) Sketch the concentration profile for oxygen stripping and absorption method for measurement of K_La by dynamic gassing out method.
   (b) Describe the procedure to determine K_La experimentally using dynamic gassing out method. [8+8]
3. (a) Draw the temperature profile for control of fermentation temperature using cooling water.
   (b) Draw the following equipment for heat exchange:
      i. internal baffle type coil
      ii. external heat exchange. [8+8]
4. Discuss the parameters on which the mixing power for non aerated fluids depend. [16]
5. The oxygen demand varies with time in a batch fermenter. Explain with the help of figure. [16]
6. (a) Write the units of diffusivity.
   (b) Sketch the concentration profile for film theory and state the assumptions.
   (c) What is gas film controlling and liquid film controlling in mass transfer. [2+6+8]
7. Derive the expression to calculate rate of heat flow through composite plane walls. [16]
8. Write short notes on
   (a) Cell concentration
   (b) Product and substrate concentration
   (c) Mixing [5+5+6]

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