Code No: R05320808 **Set No. 1**

III B.Tech II Semester Regular Examinations, Apr/May 2008
FLUIDIZATION ENGINEERING
(Chemical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Define a spouted bed with neat diagram and explain the pressure drop-flow diagram. [16]
2. Explain fluid catalytic cracking (FCC) using SOD model IV reactor system. [16]
3. Discuss the following:
   (a) Geldart A particles
   (b) Geldart B particles. [8+8]
4. A larger slug of gas is injected into a 30cm ID incipiently fluidized bed of 500μm dia sand particles. If u_{mf} =25cm/s, $\in_{mf}$ =0.44 and bubble size in 12 cm, find
   (a) the rise velocity of the bubble and
   (b) the cloud thickness [8+8]
5. Discuss, in detail, the different bubble size correlations. [16]
6. Explain in detail FBH and TDH in fluidized beds [16]
7. Discuss in detail steady state tracer studies of vertical and horizontal dispersion of gas in bubbling beds. [16]
8. Develop an expression for heat transfer between a gas bubble and dense bed in a fluidized bed. [16]

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Code No: R05320808 **Set No. 2**

III B.Tech II Semester Regular Examinations, Apr/May 2008
FLUIDIZATION ENGINEERING
(Chemical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain circulating fluidized beds with a neat diagram. [16]
2. How LLDPE is produced using Unipol process, explain in detail. [16]
3. Discuss the Geldart classification of particles and describe them with a chart. [16]
4. Define wake fraction. Describe the wake region, and the movement of solids at bubbles [16]
5. Discuss the experimental findings for emulsion movement of small and fine particles in a fluidized. [16]
6. Explain in detail vertical mixing and segregation of solids in fluidized beds. [16]
7. Write notes on estimation of gas interchange coefficients. [16]
8. Develop an expression for heat transfer between a gas bubble and dense bed in a fluidized bed. [16]

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Code No: R05320808 **Set No. 3**

III B.Tech II Semester Regular Examinations, Apr/May 2008
FLUIDIZATION ENGINEERING
(Chemical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Define fluidization and explain the phenomenon of fluidization in detail. [16]
2. Explain the thermal cracking of naphthe using 'Lurgi sand cracking unit'. [16]
3. Explain the pneumatic transport of solids in fluidized beds. [16]
4. Calculate the initial size of bubbles forming above a perforated plate distributor with a square array of 3mm holes spaced 1cm apart. u_0 =35cm/s and u_{mf} = 3cm/s [16]
5. Discuss the experimental findings for emulsion movement of small and fine particles in a fluidized. [16]
6. Discuss the dispersion model for interpreting the experimental findings on the vertical movement of solids. [16]
7. Write notes on estimation of gas interchange coefficients. [16]
8. Explain and differentiate overall bed coefficient and local coefficient with respect to mass transfer in case of fluidized bed. [16]

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Code No: R05320808 **Set No. 4**

III B.Tech II Semester Regular Examinations, Apr/May 2008
FLUIDIZATION ENGINEERING
(Chemical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Describe the following contacting systems in gas fluidized beds.
   (a) Counter current contacting
   (b) Cross current contacting
   (c) Solid circulation between two fluidized beds. [5+5+6]
2. Explain the gasification of municipal solid waste using Pyrox process. [16]
3. Define terminal velocity of a particle? Describe the equations suggested. [16]
4. Discuss the "coalescence and splitting of bubbles. [16]
5. Discuss the experimental findings for emulsion movement of small and fine particles in a fluidized. [16]
6. Explain in detail FBH and TDH in fluidized beds [16]
7. Explain the Stimulus - response studies of flow behavior of gas in fluidized beds. [16]
8. Explain and differentiate overall bed coefficient and local coefficient with respect to mass transfer in case of fluidized bed. [16]

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