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## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B.Tech CE+RP  
Subject (Course): Fluidization  
Course Code : CHEG472  
No. of page/s: 01

Semester –VII  
Max. Marks : 100  
Duration : 3 Hrs

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NOTE: i) Attempt ALL from Section A and any TWO from Section B  
ii) Make necessary assumption in case of data missing.  
iii) Exchange of calculators NOT allowed.  
iv) Use appropriate sketches (wherever needed).

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### SECTION A [10×6=60]

1. Give the design procedure for perforated plate type gas distributor for commercial fluidized bed reactor.
2. Write a detailed note on ‘fluidized bed quenching.’
3. Explain the Geldart classification for fluidized bed particles along with their characteristics.
4. Calculate terminal velocity for the sharp and irregular sand particles for following data:  
 $\rho_g = 1.2 \times 10^{-3}$ ,  $\mu = 1.8 \times 10^{-4}$ ,  $d_p = 160 \mu m$ ,  $\phi_s = 0.67$ ,  $\rho_s = 2.6 g / cm^3$
5. Describe the fluidized bed principles used in coating process.
6. Write in details the principles, working, schematics along with advantages and disadvantages of fluid bed granulator.

### SECTION B [20×2=40]

7. What are the different models available for modelling bubbling fluidized bed? Explain hydrodynamic models including K-L model in details.
8. Calculate the terminal velocity of (i) 10- $\mu m$  spheres, (ii) 1-mm spheres, (iii) 10- $\mu m$  irregular, sphericity=0.67. Consider following data:  
 $\rho_s = 2.5 g / cm^3$ ,  $\rho_g = 1.2 \times 10^{-3} g / cm^3$ ,  $\mu = 1.8 \times 10^{-4} g / (cm.s)$
9. Discuss in details: Pressure drop vs velocity diagram for ‘not too small-uniformly sized particles.’