

Name:	 UPES UNIVERSITY WITH A PURPOSE
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, Dec 2020

Course: Particle and Fluid Particle Processing
Program: B. Tech (Chemical Engineering)
Course Code: CHCE 3030

Semester: 5
Time: 03 hrs.
Max. Marks: 100

Instructions:

1. This is a **closed book** examination. Please write your answers with detailed information, wherever required.
2. In case of any missing data or information, make necessary assumptions with proper reason.

SECTION A

S. No.		Marks	CO
Q 1	What is particulate system? Will it be right to call them fluids? State reason (<i>only one is enough</i>).	5	CO1
Q 2	Out of open and closed circuit crushing, which one do you think is more efficient? State your reason (s).	5	CO2
Q 3	What is terminal settling velocity? What is its importance?	5	CO3
Q 4	What is pneumatic transport?	5	CO4
Q 5	What is nanoparticle? Will it be right to call a single “human hair” as a nanoparticle? State reason (<i>only one is enough</i>).	5	CO5
Q 6	What is sedimentation? Give any two applications where sedimentation is involved.	5	CO3

SECTION B

Q 7	You are provided with 1 kg of powder (any material of your choice). Give at-least four methods (each) to characterize the size and shape of the powdered particles.	10	CO1
Q 8	A powder material of average size of ~0.5 inch needs to be size reduced to about ~5 μm in size. Select suitable size reduction equipment for the purpose with proper reasons. Describe in details about the working of the equipment and its dominant mode of comminution involved.	10	CO2
	OR		
	Explain in detail about the similarities and dissimilarities between a cone crusher and gyratory crusher.	10	
Q 9	State in detailed about the differences between free settling and hindered settling. Include which of the assumptions are relax during the study of hindered settling.	10	CO3
Q 10	How can you transform a fixed bed into a fluidized bed? Elaborate the detailed steps in point wise.	10	CO4
	OR		

	What are the necessary assumptions, which have been considered during the derivation of Kozeny-Carman equation?	10	
Q 11	With the help of five (5) examples, elaborate in detail about the role of nanotechnology in the improvement of modern human civilization.	10	CO5
SECTION C			
Q 12	Explain with detailed sequential steps about batch sedimentation test. What is its importance and where is it utilize.	20	CO4