



DEPARTMENT OF CHEMICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY CALICUT

Name: Ch. Chasidma

Reg. No. BT20677611

WINTER SEMESTER 2015

Test I

CH 2005 MECHANICAL OPERATIONS

Duration: 1 hour

Date :12.02.2015

Maximum Marks: [20]

Answer all the questions

(Any missing data may be suitably assumed)

1. Why is it necessary to characterize solid particles? [1]
2. Name the methods available to measure the particle size along with their size range? [3]
3. Calculate the volume surface mean diameter and mass-mean diameter for the following screen analysis. [4]

Size, mm	Mass retained (g)
-1.70 + 0.85	25
-0.85 + 0.60	30
-0.60 + 0.50	40
-0.50 + 0.425	35
Pan	20

4. What should be the criteria for the selection of size-reduction equipments? Explain the working operations of any one grinder with neat sketch? [5]
5. Explain the empirical laws used for size reduction and also present the differential form of the equations. [4]
6. A continuous grinder obeying the Bond crushing law grinds a solid at the rate of 800 kg/h from the initial diameter of 12 mm to the final diameter of 2 mm, the work index of the given material is 13.06 kWh/tonne. If it is required to produce particles of 1-mm size, what would be the output rate of the grinder (in kg/h) for the same power input? [3]
