

MINOR-II (October -2009)

CH 133 NL- POWDER PROCESSING AND TECHNOLOGY

time: 1 hr.

(Answer all questions)

[List any assumptions made]

1. Derive the expression to use Blaine apparatus for measuring the surface area of the powder. List the assumptions.
2. Explain in not more than three lines with reference to breakage and selectivity the effect of following design and operating variables on product size.
 - i) Hammer size
 - ii) Number of hammers
 - iii) Speed of hammer rotation
 - iv) Feed rate
 - v) Feed size
3. Derive the expression to use Blaine apparatus for measuring the surface area of the powder. List the assumptions.
4. List the conditions required for use of Stoke's equation to measure size distribution in sub-sieve size range by Andersen Pipette method.
5. A pigment of size distribution given in Table-8.1 is used for powder coating on a metal surface. The surface area to be coated is 4000 m^2 . Calculate the amount of pigment required in Kg. (Density of pigment particles is 2400 Kg/m^3)

Table-8.1 Size distribution of pigment

d_p [microns]	2	4	6	8	10	12	14	16	18	20
$Q_0(x)$ [-]	10	20	30	40	50	60	70	80	90	100

6. Identify two unit operations which need the knowledge of powder processing in the following industries
 - i) ICI
 - ii) Asian Paint
 - iii) GE Plastics
 - iv) Steel Authority of India
 - v) NTPC
Coal storage, Coal grinding.