2006 NATIONAL INSTITUTE OF TECHNOLOGY [NIT]
B.TECH III SEMESTER MID TERM EXAMINATIONS
PARTICULATE TECHNOLOGY
(CHEMICAL ENGINEERING)

TIME: 3 HOUR
MARK: 100

ANSWER ANY FIVE FULL QUESTIONS

1. Define particle size and shape. Based on size analysis how do you determine surface area of a mixture. Give equations for 3 different mean diameters.

2.a) Starting from basic differential equation, derive equations for three laws of size reduction.

b) 10 cms feed is crushed to 1.5 cm average size product consuming 5kwh/ton.If product size is reduced to 1 cm for same feed, what is the power consumption, when Rittinger's law is used and when Kick's law is used. Which is more reliable and why.

3.a) Describe the 3 different industrial screens,

b) Derive the expression for effectiveness of screening. How does it vary with capacity.

4a) List the gas cleaning equipments used in industry

b) With a neat sketch explain the working of cyclone separator.

5. Describe how based on a single batch sedimentation test conducted in the laboratory, the minimum cross sectional area of a continuous thickener can be determined.

6.a) Derive the expressions for constant rate and constant pressure filtrations.

b) A filter press operating under constant pressure, give 400 litres of filtrate in 60 minutes. What are the amounts of filtrate collected in Is', 30th, and 60th minutes? If 50 litres of wash water is used, what are washing times.

7. Write notes on:

a) Magnetic separation.

B) Froth Flotation.

8. Write briefly on any two:

a) Double cone classifier

b) List of mixing equipments for dry powders, wet pastes and liquids.

c) Storage and conveyance of solids.