SE – Chem – Sem IV – CBSGS – Sft 20 – 19/12/14 – 2.30-5.30

QP Code :12598

(3 Hours) [Total Marks : 80

N.B : (1) Question No.1 is **compulsory**.
(2) **Solve any three** from remaining questions.
(3) **Assume** suitable **data** wherever **necessary**.

1. Write short notes (any **four**) : 20
   (a) **Fluidization**
   (b) **Flotation**
   (c) **Particle size measurement techniques**
   (d) **Filtration**
   (e) **Sedimentation.**

2. (a) Explain with neat sketch construction and working of Ball mill. 10
   (b) A slurry containing 5 kg of water per kg of solids is to be thickened to a sludge containing 1.5 kg of water per kg of solids in a continuous operation. Laboratory tests using five different concentrations of the slurry yielded the following results : 10

Concentration (kg water/kg solid)	5.0	4.2	3.7	3.1	2.5
Rate of Sedimentation (mm/s)	0.17	0.10	0.08	0.06	0.042

Calculate the minimum area to effect the separation of 0.6 kg of solids per second.

3. (a) Discuss in brief plate and frame filter press. 10
   (b) Define screen effectiveness and derive the formula for calculation of effectiveness of screen. 10

4. (a) Explain constant rate filtration and constant pressure filtration. 10
   (b) What is the effect of fluid velocity on pressure gradient and pressure drop in fluidized bed. 10

5. (a) Derive an expression to estimate the size of the smallest particle that can be separated in a cyclone separator. 10
   (b) Discuss in detail negative pressure pneumatic conveying system. 10

6. (a) A crusing roll 1m in diameter are set so that the crushing surface are 12.5mm apart and the angle of nip is 31°. What is the maximum size of particle which should be fed to the rolls. 15
It the actual capacity is 12% of the theoretical, calculate the throughput in kg/s when running at 2.0Hz if the working face of the rolls is 0.4m long and feed weighs 2500kg/m³.

(b) Explain the degree of mixing and rate of mixing in case of mixing of dry solids. 10

GN-Con.:12105-14.