SE-SEM IV
Q. P. Code: 39522

CBCGS [Total : 80]
CHEM-SFMO

(3 Hours)

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

Q1. Answer the following questions: (20)
a. Explain types of fluidization
b. Explain Negative pressure pneumatic conveying system
c. State and explain Laws of Crushing.
d. Write shorts note on Fabric filter.

Q2 (a) A material is crushed in jaw crusher. Average size of particle reduced from 50 mm to10 mm with consumption energy of 13 kW/kg/s. What will be the consumption energy needed to crush the same material of average size 75mm to average size of 25 mm. (10)
Assuming: 1) Rittinger's Law. 2) Kick's Law 3) Bond's Law.
Which is more reliable result?
(b) Derive the expression for minimum fluidization velocity in details. (10)

Q3 (a) Explain the working of Ball mill. Derive the expression for critical speed. (10)

(b) A plate and frame press filtering a slurry, gave a total of 25 m^3 of filtrate in 30 minutes and 35 m^3 in 60 minutes when filtration was stopped. Estimate the washing time in minutes if 10 m^3 of wash water are used. The resistance of the cloth can be neglected and a constant pressure is used throughout. (10)

Q4 (a) Explain in details Kynch theory of sedimentation (10)
(b) In context with solid handling and transportation derive Jensen's Equation. (10)

Q5 (a) Derive the expression to estimate the size of smallest particle that can be separated from cyclone separator (10)
(b) A rotary filter operating at 0.03 Hz, filter at the rate of 0.0075 m^3/s. operating under the same vacuum and neglecting the resistance of the filter cloth, at what speed must the filter be operated to give a filtration rate of 0.0160 m^3/s. (10)

Q6 Answer the following questions. **(Any Four)**: (20)
i. Explain a type of packings used in packed bed.
ii. Elutriation
iii. Muller mixer
iv. Explain Ribben blender
v. Belt conveyor

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