

( 3 Hours)

Total Marks :80

N.B. (1) Question No 1 is compulsory

(2) Attempt any three questions out of remaining five questions

(3) Assumption made, if any should be clearly stated

(4) Figures to the right indicate full marks.

- Q 1 (a) State and explain Laws of Crushing 05
- (b) Discuss gas solid fluidization 05
- (c) Explain Electrostatic Precipitator. 05
- (d) Explain Factors in selecting Screening Equipment. 05
- Q 2 (a) A crushing roll 1 m in diameter are set so that the crushing surface are 12.5 mm a pare and the angle of Nip is  $31^\circ$ . What is the maximum size of particle which should be feed to the rolls. If the actual capacity is 12 % of theoretical. Calculate the throughput in kg/s when running at 2.0 Hz if the working face of the rolls is 0.4m long and feed weighs  $2500 \text{ kg/m}^3$ . 10
- (b) Describe in detail The Kynch theory of Sedimentation. 10
- Q 3 (a) Explain with neat sketch continuous rotary drum filter. 10
- (b) A plate and frame press, filtering a slurry, gave a total of  $8 \text{ m}^3$  of filtrate in 1800 seconds and  $11 \text{ m}^3$  in 3600 seconds, when filtration was stopped .Estimate the washing time in seconds if  $3 \text{ m}^3$  of wash water was used. The resistance of the cloth can be neglected and a constant pressure is used throughout. 10
- Q 4 (a) Explain mixing index in blending granular solids. 10
- (b) Describe with neat sketch single blow tank high pressure pneumatic conveying system. 10
- Q 5 (a) Discuss conditions for fluidization in details. 10
- (b) Derive the Expression for screen effectiveness. 10
- Q 6 Explain the following terms (any four ) 20
- (a) Pressures in bins and silos.
- (b) Elutriation
- (c) Discuss size reduction in ball mill.
- (d) Froth-floatation
- (e) Explain free settling and hindered settling.
- (f) Explain filter aids