

※ 考生請注意：本試題可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. The definition of terms: (a) Locking Factor (b) Heavy-fluid separation (c) Ratio of concentration (d) Natural floatability (e) Paramagnetic. (15%)
2. Please elaborate more about three major comminution theories, their energy consumed and suggest operation condition? (15%)
3. (a) The discharge gap of roll crusher is 2.5 cm and the diameters of the rolls and of the particle are 3 m and 50 cm, please calculate the angle of nip. (b) Draw the definition about the angle of nip and prove it. (10%)
4. Define the principle of area. The sedimentation tank (depth=2 m, width=8 m) processes the treatment of wastewater (solid density= 2.6kg/m³) with flow rate 10 m³/hr and the maximum particle size of the suspended particles in the wastewater is 2.2×10^{-6} m after the agglomeration of the suspended particles. What is the length of the settling tank? (10%)
5. In flotation operations, please list five major modifiers, and give one example of chemical to describe their usage in five categories? (15%)
6. What is the mechanism of eddy current separation? What kind of function of material is related to the magnitude of current? Please give three examples of material. (15%)
7. Describe three main controlling factor of shaking table in detail. (10%)
8. Please describe the contact angle and explain it by Young-Dupré equation. (10%)

$$\text{Young equation: } \gamma_{SG} - \gamma_{SL} - \gamma_{LG} \cos \theta_C = 0$$

$$\text{Dupré equation: } \gamma(1 + \cos \theta_C) = \Delta W_{SLV}$$