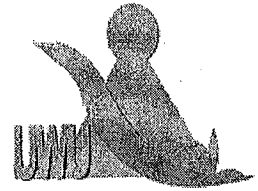


Uva Wellassa University, Sri Lanka  
End Semester Examination – July 2010  
CHE 401-2 Mineral Processing Methods



Time: Two (02) hours

Total 05 Questions

Answer **four (4)** questions only

Illustrate your answers with labeled sketch diagrams where necessary

- 01) i. What are the main gravimetric separation methods? (10 marks)
- ii. Briefly discuss main gravimetric methods used in mineral processing industry with the aid of a diagram. (75 marks)
- iii. What are the advantages and disadvantages of physical separation methods with respect to chemical methods? (15 marks)
- 02) i. What is Comminution? (10 marks)
- ii. Briefly discuss, with the aid of diagrams;  
(a) Primary and secondary crushers (40 marks)  
(b) Ball mill, Rod mill and Autogenous mill (30 marks)
- iii. Explain zones of similar size distribution in a hydro cyclone with the aid of a diagram. (20 marks)
- 03) i. Explain industrially available leaching methods. (20 marks)
- ii. Explain, how gold is extracted using leaching. (30 marks)
- iii. Calculate the settling time of the particles with the following diameter sizes (d) and given conditions.  
d = 30 ,50, 100 microns

Viscosity of slurry =  $1.010 \times 10^{-3}$  Pa.s

Specific gravity of (X) mineral = 2.65

Slurry height from bottom to top level of slurry = 30 mm

Acceleration due to gravity =  $9.8 \text{ m/s}^2$

(50 marks)

- 04) i. Explain dewatering and drying processes and their importance in mineral processing industry. (20 marks)
- ii. Briefly discuss plate & frame filter press and chamber plate filter press methods using diagrams and discuss advantages and disadvantages of them. (20 marks)
- iii. Calculate percentage finer and draw a graph for percentage finer vs particle size diameter and determine  $d_{50}$  value.

Sieve Size (Microns)	Weight retained (g)
1140	5
850	10
710	20
600	30
550	45
425	50
355	75
275	35
180	45
125	20
90	15
75	12

(60 marks)

- 05) Explain the following:
- (a) Electro-winning
  - (b) Beach mineral sand separation
  - (c) Dust collectors
  - (d) Electro-refining

(25x4 marks)