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 = 1.010×10^{-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 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-wining
(b) Beach mineral sand separation
(c) Dust collectors
(d) Electro-refining

(25x4 marks)