Uva Wellassa University, Sri Lanka
End Semester Examination – Aug./Sep. 2011

MRT 111-1 Crystallography
-Repeat-
Time: One (01) hour

Total four (04) questions
Answer all questions

01) i. What are the assumptions in atomic hard sphere model? Using a sequence of illustrations, build up the cubic closest packing (CCP) structure. (10 marks)

ii. Discuss the relationship between atomic radius ratio and coordination number in mineral crystals. (10 marks)

iii. Describe the six crystal systems with their characteristic symmetries. (05 marks)

02) i. Draw a body centred cubic (BCC) crystal structure using atomic hard sphere model. Show the relationship between the atomic radius R and unit cell edge length *a* for BCC crystal structure. (10 marks)

ii. Atomic Packing Factor (APF) is given as the ratio between the volume of atoms in a unit cell and the total unit cell volume. Use this information to calculate APF for BCC crystal structure. (15 marks)

03) i. Write short notes on the following.

a. Characteristics of crystalline and amorphous materials (05 marks)
b. Pinacoid, prism, cube, dipyramid, octahedron (10 marks)
c. Derivation of Miller Index of a crystal face (10 marks)

04) i. Describe the symmetry and crystal forms of 2/m2/m2/m crystal class. (10 marks)

ii. Draw a tetragonal prism in perspective view with appropriate orientation of crystallographic axes. Derive the Miller Indices of prism faces. (15 marks)