Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
300 level 2nd Semester Examination – January 2019
SCT 355-1 Glass Science and Technology

Uva Wellassa University

Instructions to candidates
Duration: 01 hour
Number of questions: 03
Mark allocation: 60
Answer all questions

1.

a. A glass is an amorphous solid. Briefly describe this statement.

(4 marks)

b. Draw a diagram showing the volume changes associated with cooling of a glass forming liquid. Mark key points and regions of this diagram.

(6 marks)

c. Why many inorganic silicates form glasses upon cooling?

(3 marks)

d. What are the structual information you obtain from Radial distribution function, J(r) of glass structure? How do you obtain them?

(7 marks)

2.

a. The addition of soda (Na_2O) and lime (CaO) into silica results considerable changes of physical properties. Describe briefly these changes.

(6 marks)

b. Most of the commercial glass products are also based on borosilicate glasses, glass fibers, and glass ceramics. Write down two (02) applications (each case) that are based on above different types of glasses.

(6 marks)

c. Viscosity of "glass forming melts" plays a major role in glass production. Draw a diagram showing viscosity and temperature values for silica glasses, soda-lime-silica glasses and borosilicate glasses.

(8 marks)

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3.

a. How do we strengthen glasses?

(6 marks)

b. Write main differences of recrystallized glasses compared with conventional non-crystalline glasses.

(5 marks)

c. Write classical forming methods for following commercial glass products.

(i) Flat glasses (ii) Lamp glasses (iii) Glass spheres

(9 marks)