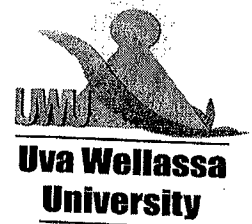
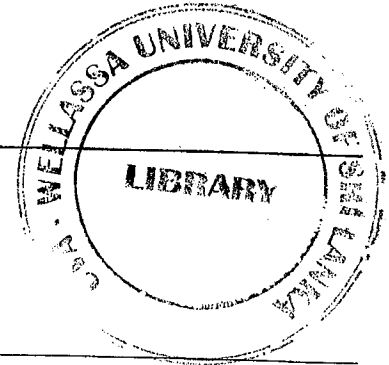


Uva Wellassa University, Sri Lanka
Faculty of Science and Technology
Science and Technology Degree program
1st Semester Examination – March/April 2013



SCT 444-1 Glass Technology



Instructions to candidates

Number of questions: Five (05)

Answer Four (04) questions only

Time allocation: One (01) hour.

Total marks allocated: 100

1.
 - a. State the *classic definition* of glass. What are the *two prime assets* of glass?
 - b. Make a rough sketch to show the variation of *specific volume* with *temperature* for a melt that forms a glass on cooling.
 - c. Based on the above sketch, show how to determine the *fictive glass transition temperature*.

(25 Marks)

2.
 - a. According to the first rule of Zachariasen, what is the maximum number of silicon atoms to which an oxygen atom can link in the SiO_2 glass structure?
 - b. In crystalline oxides the polyhedra should share both corners and edges. What should the polyhedra share in oxide glasses?
 - c. With the help of a rough sketch, explain the *Si-O-Si bridge-rupture mechanism*.

(25 Marks)

3.
 - a. To which type of glass does the commercial PyrexTM belong?
 - b. Name the four *major ingredient types* used in container glass manufacturing. What are the *main oxides* used for these major ingredients in the local glass industry?
 - c. Explain the main function of *soda* in glass and list two main disadvantages of it.

(25 Marks)

4. a. Name the three *minor ingredient types* used in container glass manufacturing.
- b. What *metal oxide* is added to give *green color* to container glass?
- c. Explain the term *de-colorization of glass*. Describe the *decolorizing process* used in flint glass.

(25 Marks)

5. a. What are the three main parts of a *glass melting furnace*?
- b. Name the three main types of *forming processes* used to make glass containers.
- c. Briefly explain the function of the *Individual Section (I.S.) Machine*.

(25 Marks)