

Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
400 Level 1st Semester Examination – May/July 2017
SCT 443-2 Polymer Science & Technology
Part C – Essay Questions



Provide your answers in separate booklet

- 1.
- i. What do you understand by glass transition temperature **(05 Makrs)**
 - ii. List the factors that affect the glass transition temperature of polymers **(15 Makrs)**
 - iii. Name two technique to that can be used to determine the glass transition temperature of polymers **(20 Makrs)**
 - iv. Briefly explain how one can use above two technique for the determination of glass transition temperature of a polymer **(20 Makrs)**
 - v. Addition of a low molecular weight species increases the free volume of the system and hence lowers the glass transition temperature. Di-n-ethylhexyl phthalate (DEPH) is commonly used to plasticize poly(vinyl chloride) to produce the pliable material at very low temperature. What fraction of DEPH should be added to PVC to bring T_g down to 30 °C, given that T_g for DEPH is -86 °C and for PVC is 87 °C ? **(20 Makrs)**
- 2.
- i. Briefly explain the following terms
 - a. Addition polymerization
 - b. Condensation polymerization
 - c. Copolymerization **(50 Makrs)**
 - ii. Ethylene can be polymerized in presence of hydrogen peroxide and heat via addition polymerization method. Hydrogen peroxide forms free radical in presence of heat and that free radical act as initiators. Explain the mechanism. **(30 Makrs)**

