Eastern University, Sri Lanka

First Year Second Semester Examination in Science-2015/2016 (May/June 2018)

CH 105-Introductions to Polymer Chemistry

(Proper)

Answer all questions **Time: 01 hour**

1 (a) Polymers sometimes are referred to as' macromolecules'. Briefly ***explain*** the statement with a suitable example.

(10 marks)

(b) (i) ***Complete*** the following table for a monomer of general structure; CH_2=CHX.

Write 'YES' if the monomer can be polymerized by the method mentioned at the top of the Column and 'NO' if polymerization by the method is not feasible. Briefly ***justify*** your answer.

X	Free radical	Anionic	Cationic
-CN			
-Ph			
$-OCH_3$			

(10 marks)

(ii) Briefly ***discuss*** each of the following free radical polymerisation steps of **styrene**.

(I) Initiation

(II) Propagation

(III) Termination by disproportionation

(30 marks)

Cont.

(c) ***Draw*** the structure of repeating units for the following polymers

(i) Poly(methyl methacrylate)

(ii) Buna-S

(20 marks)

(d) Briefly ***discuss*** the following;

(i) Thermoplastics

(ii) Neoprene

(iii) Ziegler-Natta Catalysis of alkenes polymerization through monometallic mechanism.

(30 marks)

2 (a) (i) ***Explain*** 'number average' and 'weight average' molecular weights of polymers.

(ii) A suspension contains equal masses of particles with molecular weights 20000 and 40000 g/mol. ***Calculate*** the number average, weight average molecular weights and polydispersity for the suspension?

(20 marks)

(b) ***Derive*** the Carothers equation for the number average degree of polymerization in step growth polymerization.

(20 marks)

(c) ***Explain*** the following terms to describe a polymer

(i) Syndiotactic

(ii) Isotactic

(iii) Atactic

(30 marks)

(d) What is copolymer and ***classify*** the different types of copolymer with an example.

(30 Marks)

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