



UNIVERSITY OF RUHUNA

Faculty of Engineering

Mid-Semester 7 Examination in Engineering: June 2015

Module Number: ME7330

Module Name: Polymer Technology

[Two Hours]

[Answer all questions, each question carries five marks]

Q1 Suggest the best polymer candidate for each of the following applications and explain your selection.

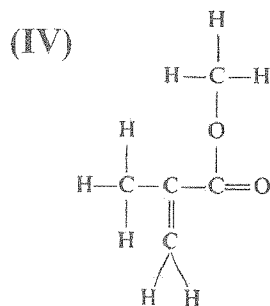
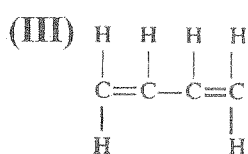
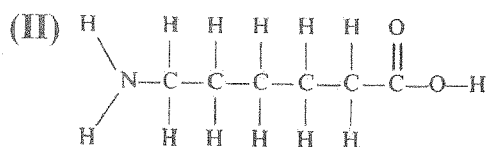
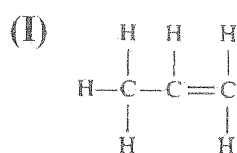
- Vehicle bumper bar
- Gutters and water pipes
- Microwave tray
- Solvent-resistant O-ring
- Observation window for a deep-drive submarine

[5.0 Marks]

Q2. a) Discuss difference in basic properties of two main groups of plastic materials 'Thermoplastics' and 'Thermo-setting Plastics'. Give examples of materials indicating their applications.

[2.0 Marks]

b) The structural formulae of some chemical compounds are given below. For each of the compound, state whether or not it can be polymerized and by what type of reaction?



[1.5 Marks]

c) Calculate the degree of polymerization and the average molecular mass of a sample of polyvinyl acetate, $(-\text{CH}_2-\text{CH}(\text{COO}.\text{CH}_3)-)_n$, polymerized using 150 g hydrogen peroxide, H_2O_2 , as an initiator per 2000 kg vinyl acetate. Assume that all of the peroxide is used to provide terminal groups. (H=1, C=12, O=16)

[1.5 Marks]

Q3. Write short notes on three of following topics.

- a) Polystyrene (PS)
- b) Polyethylene (PE).
- c) Melamine-formaldehyde (MF).
- d) Natural rubber (NR).

[5.0 Marks]

Q4. a) What do you expect from 'Polymer Mixing'?

[2.0 Marks]

- b) Validate the statement "Plastics paly a major roll in modern product manufacturing" giving examples.

[3.0 Marks]