



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 7 Examination in Engineering: July 2016

Module Number: ME7314

Module Name: Polymer Technology

[Three Hours]

[Answer all questions, each question carries 12 marks]

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- Q1. a) Briefly describe how polymers can be classified according to the structure. [3.0 Marks]
- b) Discuss on followings with examples. [6.0 Marks]
- i) Thermoplastics
 - ii) Thermosets
 - iii) Elastomers
- c) What is glass-transition temperature? Discuss factors affecting on glass-transition temperature. [3.0 Marks]
- Q2. a) What is degree of polymerization? [1.0 Mark]
- b) Polypropylene contains molecules having following molecular weights 3 of 10,000 g/mol and 2 of 30,000 g/mol and 6 of 50,000 g/mol. Calculate number average and weight average degree of polymerization [3.5 Marks]
- c) Suggest the best polymer candidate for each of the following applications and explain the reasons for your selection. [7.5 Marks]
- i) Shampoo bottles
 - ii) Bullet-proof glass
 - iii) Bathroom fixtures
 - iv) Door knobs
 - v) Tires
- Q3. a) Briefly explain the function of extruder while identifying the major components of extruder by presenting a clear sketch. [4.0 Marks]
- b) Discuss the processing problems associated with extrusion process. [4.0 Marks]
- c) Provide sketches of the three different types of molds used in compression molding. [4.0 Marks]

Q4. a) Classify following resin identification codes.



[4.0 Marks]

b) Identify environmental issues of concern arising from the manufacturing of plastic and rubber products.

[4.0 Marks]

c) Describe methods which can be used to prevent above (Q4.b) issues.

[4.0 Marks]

Q5. a) Explain the importance of using gates in injection molding.

[2.0 Marks]

b) Discuss on advantages associated with rotational molding process.

[4.0 Marks]

c) Explain followings.

i) Vacuum Thermoforming

ii) Pressure Thermoforming

iii) Drape Thermoforming

[6.0 Marks]