# Centre for Polymer Science and Engineering
## PTL702: Polymer Processing
### Major Test (09-05-2007)

**Time: 2 Hours** **Total Marks: 50**

Q1. Answer the following questions (brief and to the point)

i) Necessary raw material characteristics for
a) Thermoforming b) Injection Moulding c) Rotational Moulding

ii) Processing equipment requirement for manufacturing of
a) Masterbatch b) Nanocomposites c) PVC compounds

iii) Wall thickness distribution for
a) PET bottles b) Overhead tanks c) Jumbo size cup

iv) Describe the moulding cycle for
a) Blow moulding b) Reaction injection moulding c) Rotational moulding

**(18)**

Q2. a) List the features that are available for compounding in single screw and twin screw extruder.

b) A polymer is extruded in a screw extruder having following dimensions:
screw die = 150 mm;
screw pitch = 150 mm;
screw channel depth = 9 mm;
metering screw length = 1 m;
screw rpm = 100

If the extruder is connected to a die with a pressure difference of 10 MPa for polymer melt of viscosity 300 cp. Draw the screw characteristic curve. **(10)**

Q.3. a) List different process parameters and their importance in injection moulding process.
b) Discuss with justification the best possible design of a multicavity mould for 10 products.
c) Compare the mould filling process between injection moulding and reaction injection moulding.
d) List the differences in injection blow moulding and extrusion blow moulding

**(12)**

Q.4. a) Compare different processes available for making refrigerator lining.
b) Write the steps involved in analysis of thermoforming process.
c) Define Sagging. How it is related to thermoformibility?

**(6)**

Q.5. Give suggestions for solving the following:
(a) The moulding exhibits high residual stress
(b) Cascading in rotomoulding operation
(c) Pleating in blow moulding process
(d) Failing of product at weld line

**(4)**