Major Test - May 2008
PTL 714 : POLYMER BLENDS & ALLOYS

Answer all questions Max. Marks :100; Time 2 hrs.

Q.I. Describe the various theoretical models for compositional dependence of mechanical properties of binary blends, and explain how these theoretical models represent the effect of interfacial adhesion in binary blends. [20]

Q.II. **(a)** Define melt viscosity and melt elasticity, and explain their role in governing extrudate distortion. [10]
(b) Write expressions relating first normal stree difference and die-swell [5]
(c) Draw diagram to show variation of melt elasticity with blend composition, indicating the effect of increasing shear stress on this vasriation [5]

Q.III. **(a)** Describe various mechanisms of rubber toughening of polymers [10]
(b) Explain how stress whitening differs from the whitening produced by shear band formation. [6]
(c) Give the expression relating contact angle with various surface energies involved at the contact point. [4]

Q.IV. **(a)** Distinguish between IPNs, graft copolymers and blends.[6]
(b) Distinguish between semi-IPN, simultaneous IPN, and sequential IPN [6]
(c) Discuss the effect of composition, and cross-linking density on the morphology of IPNs. [8]

Q.V. **(a)** Write a brief note on PVC / Acrylic blends [10]
(b) Define stress concentration effect and discuss its role in impact toughening of polymers [6]
(c) Distinguish the acrylic systems: acrylic plastics and acrylic fibres on the basis of their chemical structure [4]