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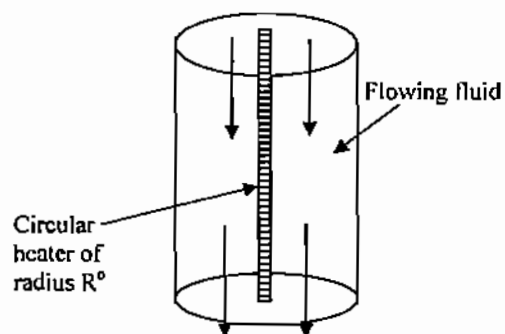
TTL713: Technology of Melt Spun Fibres

MAJOR TEST (November 29, 2006)

You may use BSL book for the first question. Answer all questions in space provided, if necessary use space available on the back page. Max. Marks = 40

Marks

1. Write the rate of momentum and heat balance differential equations for the following steady state system using equation of change given in Tables 3.4-1 to 3.4-3 and 10.2-1 to 10.2-3. Give reasons for canceling the terms. **Do not** give boundary conditions or profiles. Assume Newtonian fluid and no viscous dissipation 4



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2. Suggest what problems can you face in melt spinning of the following cases? And why?

4x3

(a) Melt spinning of a random copolymer of polyester

(b) Melt spinning of PP of melt flow index (MFI) = 2.

(c) Melt spinning at a very high draw down ratio (take-up/extrusion velocity)

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3. Write whether the following statements are true or false; give reason for your answer.

4x3

(a) The neck moves towards the spinneret as the spinning speed is increased in high speed spinning.

(b) In a spinning line, apparent viscosity always rises with increasing distance from the spinneret.

(c) The as-spun fibers of nylon – 6 are always crystalline because stress induced crystallization starts at a very low spinning speed.

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3. Suggest when will the following be observed? And why?

4x3

(a) Crystallinity percentage does not change on drawing.

(b) PET POY breaks on drawing even at drawing temperature of 100 °C.

(c) A thermoplastic fiber shrinks even after it has been drawn and heat-set.