PTL705 Polymer Characterization

Part B Major Test Max: 10 points

Q. No.1 **Three samples A, B, C from a polymer (say PET) has following characteristics (typically observed with different draw ratios):**

Crystallinity A > B > C Crystalline Orientation A > B > C

The differences between them are rather small. The labels of the samples got mixed up. How would you label them? Could you suggest an independent confirmation of your observations? 5 points

Q. No.2 **Two samples of glass polyester composite are given. It is known that one sample has a random orientation of glass and the other sample has planer orientation. How would you confirm this? Explain the principle of the system used. 5 points**

Expressions which may be useful: $f_c = \frac{1}{2}[3\langle\cos^2\phi\rangle - 1]$; **Xc** $= \int s^2 I_C(s)\, ds \,/\, \int s^2 I(s)\, ds$

$\langle\cos^2\phi\rangle = [\int_0^{\pi/2} I(\phi)\sin\phi\cos^2\phi\, d\phi] \,/\, [\int_0^{\pi/2} I(\phi)\sin\phi\, d\phi]$; $\ln I(s) = \ln I(0) - 1/3\, s^2 R^2$