TTL202 Manufactured Fibre Technology

Major Part B Max Marks 18 29th April 2008

Q. No.1 Give an estimate of the diameter of the spinneret hole to make filament with a diameter of 10μm. For the process of melt spinning of the filament, spin draw ratio is 200, draw ratio is 3 and shrinkage during heat setting is 15%. Will there be any change in these calculations while estimating the spinneret hole diameters for hollow fibres with similar process parameters. Explain. 2+2

Q. No.2 (a) It is observed in a given melt spinning process that crystallization is occurring in the spin line (before the filament is quenched below Tg). How the thread line behaviour changes due to the crystallization as compared to when it is not crystallizing? (b) How would you achieve essentially amorphous PET POY with increased spinning speed beyond the typical values of spinning speeds of say 3300m/min? 2+2

Q.No.3 Industrial grad filaments are to be made from Poly (propylene terephthalate) (PPT). Give some ideas of production parameters. Some basic parameters of the polymer are (a) melting range 215-230°C (b) glass transition temperature 55°C (c) crystallization rate is medium. 3

Q.No.4 Compare stretch breaking method with that of cutting method for production of staple from continuous filaments (tows). 3

Q.No.5 A sequence of elements of spin draw process in a melt spinning is given: Hopper-extruder-pipes for melt distribution- gear pump- filters- spinneret- spin finish applicator- cooling chimney -roller-1st stage drawing -2nd stage drawing - shrinkage stage-intermingling stage-winding. Is this sequence correct? Correct the sequence it if wrong. Explain basic functions of each element briefly. 4