

1. (a) Explain the structural changes in neck drawing stage. 3
- (b) If you are having the primary sequence of a protein. Enumerate the steps that the modeling servers follow to generate the theoretical structure. 2
2. (a) What is the purpose of xanthation step in viscose preparation? Explain with chemical reaction. 2
- (b) What are the problems associated to use of CS₂? 1
- (c) Explain the mechanism how N-methylmorpholine-N-oxide dissolves cellulose. 2
3. (a) It is important to maintain moisture-free inert atmosphere during PET production. Explain with chemical reactions. 2
- (b) Explain correctness of this statement: Hydration affects the mechanical properties of silk by reducing the glass-transition temperature of the amorphous domains. 3
4. Explain the mechanism of thermo-oxidative degradation of polypropylene and enumerate the methods by which it can be inhibited. 5
5. Nylon degradation is a major problem post production.
- Name the degradation mechanism involved in the formation of Nylon gel?1
 - Explain the mechanism of gel formation.2
 - Which type of degradation causes yellowing of the polymer?1
 - What can be the solution to this problem?1
6. What are the side reactions during PET polymerization during melt spinning? 5
7. (a) What is the meaning of parallel or anti-parallel β -sheet structure? 1
- (b) Silk fibroin can form intramolecular/intermolecular β -sheet crystallites, parallel/antiparallel β -sheet crystallites, as well as β -sheet crystallites of different sizes and orientations along the fiber axis. How that leads to wonderful mechanical property of silk fibre? 4