

**THE OPEN UNIVERSITY OF SRI LANKA**  
**DIPLOMA IN INDUSTRIAL STUDIES/ TECHNOLOGY**  
**TTX3231 FIBRE SCIENCE & TECHNOLOGY**  
**FINAL EXAMINATION – 2008/2009**  
**DURATION: THREE HOURS**



034

**Date: 12<sup>th</sup> March 2009**

**Time: 0930 –1230 Hrs**

**Answer Question 01, which is compulsory and additional five (05) questions.**

**Question 1 carries twenty-five marks (25) and Questions 2 to 8 carry fifteen (15) marks each.**

**(01) Compulsory Question**

- (i) Give two examples each for the following categories of fibres:  
(i) Seed fibres  
(ii) Bast fibres  
(ii) Regenerated fibres **(03 Marks)**
- (ii) Describe special features of the following fibres when examine through the microscope.  
(i) Cotton (ii) Wool (iii) Nylon **(03 Marks)**
- (iii) What do you understands by 'Addition Polymerisation'? **(02 Marks)**
- (iv) Explain why a high melting point is desirable for textile fibres? **(03 Marks)**
- (v) Describe the term "thermoplastic". **(02 Marks)**
- (vi) Write two factors, which influence the moisture absorbency of a fibre. **(02 Marks)**
- (vii) What are the raw materials used for polymerisation of Nylon 6.6? **(02 Marks)**
- (viii) What are the important chemical groups present in Polyester Polymer? **(02 Marks)**

(ix) What are the types of bonds present in the polymer system of cotton and compare the strength of each other. **(03 Marks)**

(x) What are the advantages of having crimped configuration in Wool fibres. **(03 Marks)**

02. (a) Discuss the importance of "Fibre Science" in the Textile and Apparel Industry. **(07 marks)**

(b) What properties do you expect from a polymer for it to be suitable for formation of fibres. Describe them. **(08 marks)**

03. Describe the salient features of the morphological structure and polymer system of cotton fibre and explain how they contribute to the following properties of cotton fibre.

(a) Tenacity (b) Hygroscopic Nature (c) Dyeing properties.

**(15 marks)**

04. (a) What do the numbers '6' and '6.6' denote in Nylon 6 and Nylon 6.6? **(03 marks)**

(b) What are the two important groups available in the nylon polymer? Explain why they are important? **(06 marks)**

(c) If the same undrawn yarn is drawn into two yarns at a ratio of 2 and 3 respectively, which yarn would have the higher tenacity? Why? **(06 marks)**

05. (a) Describe a spinning process which is suitable for thermoplastic polymer **(07 marks)**

(b) Describe the "Wet Spinning" process. **(08 marks)**

06. Describe the production process of viscose rayon, starting with the chipped wood as the raw material. **(15 marks)**

07. (a) Discuss the importance identification of textile fibres. **(05 marks)**

(b )In a laboratory there are four different fibre types kept in different boxes. Their labels are missing. The fibre types are Cotton, Nylon, Wool and Viscose. Explain how would you identify these fibres.

**(10 marks)**

08. Discuss the following properties of textile fibres and their importance and relevance. **(15 Marks)**

- (i) Strength of the fibre.
- (ii) Thermo plasticity
- (iii) Affinity for dyes