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UNIVERSITY OF ESWATINI

FINAL EXAMINATION PAPER

PROGRAMME	:	BACHELOR OF SCIENCE IN TEXTILE APPAREL DESIGN and MANAGEMENT YEAR II
COURSE CODE	:	TAD213
TITLE OF PAPER	:	FIBRE CHEMISTRY
TIME ALLOWED	:	TWO (2) HOURS
INSTRUCTIONS	:	ANSWER QUESTION ONE (1) AND ANY OTHER TWO (2) QUESTIONS

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QUESTION 4

a) Briefly describe the preparatory processes involved in the chemical processing of cotton **(12 Marks)**

b) Describe the acid hydrolysis of cotton fibres **(8 Marks)**

c) Acrylic fibres based solely on acrylonitrile have a number of undesirable properties. State those properties. **(4 Marks)**

d) Give **four (4)** characteristics of crystalline polymers. **(4 Marks)**

e) Name any **two (2)** textile fibre characterisation techniques. **(2 Marks)**

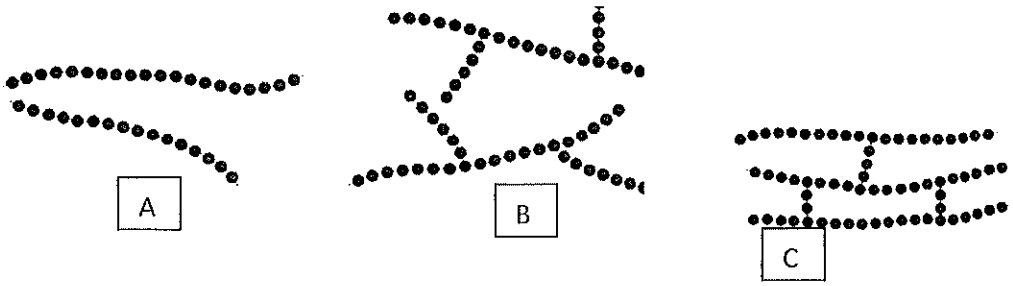
[TOTAL MARKS=30]

QUESTION 1(COMPULSORY)

a) Differentiate between natural and synthetic polymers. **(2*5= 10 Marks)**

b) Explain the **three (3)** steps involved in a chain reaction polymerization mechanism. **(12 Marks)**

c) Identify and briefly describe the following polymer structures. **(9 Marks)**



d) Briefly describe the effect of alkali on wool fibres. **(6 Marks)**

e) Give **three (3)** properties of nano fibres. **(3 Marks)**

[TOTAL MARKS=40]

QUESTION 2

a) Describe the following types of polymers and give an example of each type **(8 Marks)**

   i) Thermoplastic
   ii) Thermosetting

b) Name any **three (3)** additives that are added to polymer solutions and state their function **(9 Marks)**

c) Briefly describe **five (5)** factors that influence polymer crystallinity **(10 Marks)**

d) Name any **three (3)** naturally occurring polymers **(3 Marks)**

[TOTAL MARKS=30]

QUESTION 3

a) Describe the electrospinning process and give any **four (4)** process parameters that influence the properties of the spun fibres **(10 Marks)**

b) Describe the production process of nylon 6.6 polymer **(10 Marks)**

c) What is the molecular weight of the following polymer if its degree of polymerization is 1000? **(5 Marks)**

$$-[CH2\text{-}CH(CH3)]n-$$

d) Briefly explain why the length of a polymer chain is an important requirement in fibre forming polymers **(5 Marks)**

[TOTAL MARKS=30]