



UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

**PROGRAMME : BACHELOR OF SCIENCE IN
TEXTILE, APPAREL DESIGN AND
MANAGEMENT & CONSUMER
SCIENCE EDUCATION YEAR II**

COURSE CODE : TADM 205

TITLE OF PAPER : TEXTILE SCIENCE AND LAUNDRY

TIME ALLOWED : TWO (2) HOURS

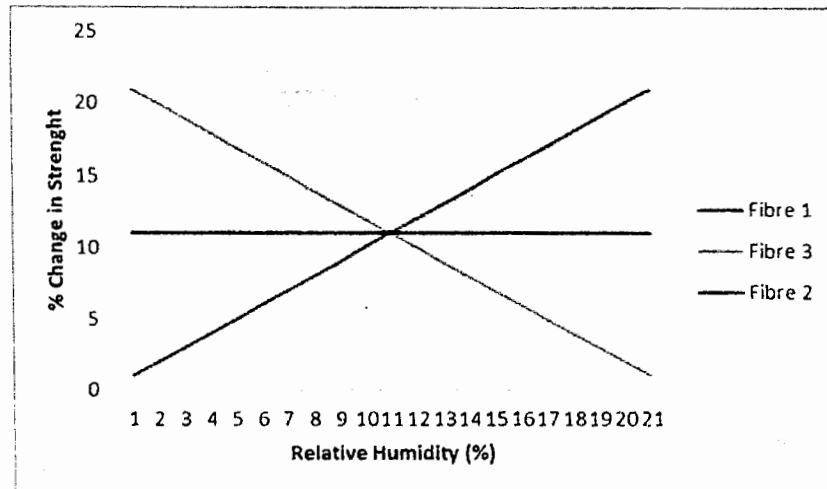
**INSTRUCTION : ANSWER QUESTION ONE (1) AND
ANY OTHER TWO (2) QUESTIONS**

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QUESTION 1 [COMPULSORY]

- a) A 5cm long filament is drawn to 20cm. What is the draw ratio?
(2 Marks)
- b) Identify the only naturally extruded fibre amongst the following. Explain how the process of natural extrusion occurs in the chosen fibre.
i) Wool
ii) Hemp
iii) Silk
(5 Marks)
- c) Choose and justify the correct answer. Pilling propensity on fabric surface is high with:
i) Increase in length of fibre used in yarn
ii) Increase in yarn twist
iii) The presence of short or loose fibres on the surface of a fabric.
(5 Marks)
- d) A yarn specimen of 200mm extends by 10% when loaded with 500 cN force. The length of the specimen after removal of the load was found to be 202mm. What is the percentage elastic recovery of the yarn? What is the formula you will use when calculating the above percentage.
(10 Marks)
- e) The relationship between the breaking strength and relative humidity of yarns made from three different fibres is shown in the following diagram.
i) Identify the fibres (series 1, 2 & 3) used to produce the yarns based on the breaking strength and absorbency properties of each of the fibres.
(6 Marks)

- ii) Describe the hygroscopic and/or hydrolytic properties of each of the fibres mentioned in (i) and its effect on the breaking strength of the yarns. (3 X 4 = 12 Marks)



TOTAL MARKS = 40]

QUESTION 2

- a) State the acrylonitrile content in the modacrylic fibre forming polymer. Justify this quantity by describing the resultant property of modacrylic fibres and possible application in protective wear, which make them different from acrylic fibres. (1 + 3 + 1 = 5 Marks)
- b) Which of the following yarns is the finest? Justify your choice. (4 Marks)
- 10s Ne
 - 10 Tex
- c) Mention and describe **three (3)** classifications of finishes that can be applied to fabrics and possible applications in apparel wear. (9 Marks)
- d) In which fabric finish are compounds based on a combination of nitrogen and phosphorus used. Justify your answer by describing the specific role of these elements in the finish. (1 + 4 = 5 Marks)
- e) Identify the weave that produces fabrics with maximum degree of smoothness, close packing of threads, heavy construction and high seam slippage. Explain why it has a high degree of seam slippage. (5 Marks)
- f) Explain why size is primarily applied on warp yarns. (2 Marks)

[TOTAL MARKS = 30]

QUESTION 3

SECTION A

- a) Match the elements in group 1 with the elements in group 2

GROUP 1

- i) Polypropylene
- ii) Cotton
- iii) Polyester
- iv) Wool

GROUP 2

- i) Poor hydrolytic stability
- ii) Excellent thermal resistance
- iii) Excellent elastic recovery
- iv) Poor resistance to acid
- v) High wet strength
- vi) Excellent chemical resistance

(8 Marks)

- b) When a blended yarn consisting of acrylic, polyester and viscose fibres is treated with 60 wt% H₂SO₄, partial dissolution is observed. Identify the fibres that will dissolve and justify your answer.

(5 Marks)

- c) Describe the importance of each of the following by fully explaining its role in laundry.

- i) Washing
- ii) Airing
- iii) Sorting

(6 Marks)

SECTION B

INSTRUCTION: Indicate whether the following statements are true (T) or false (F).

- d) Jute, flax and ramie belong to:

- i) The family of leaf fibres
- ii) The family of bast fibres

(2 Marks)

- e) The group of fibres produced by solution spinning is:

- i) Viscose and polyamide
- ii) Polyester and acrylic
- iii) Viscose and acrylic
- iv) Polyamide and acetate.

(4 Marks)

- f) With increasing twist, spun yarn strength
- Increases continuously
 - Decreases initially and then increases
 - Increases initially then decreases

(3 Marks)

- g) What is the length of 2kg of 180 denier polyester yarn

(2 Marks)

[TOTAL MARKS = 30]

QUESTION 4

- a) Illustrate the symbol for the following care labels and give **one (1)** example of a fabric that would not have that care label based on its properties. **Justify** your fabric choice by mentioning the fabric property.
- Tumble dry
 - Very hot iron
 - Dry clean with perchloroethylene and fluorohydrocarbons.

Symbol illustration	Fabric example	Fibre/fabric property
i)		
ii)		
iii)		

(6 + 3 + 6 = 15 Marks)

- b) Cellulosic man-made fibres are made from natural cellulose polymers extracted from plants. To enable the spinning process, fully describe **two (2)** different processes that can be employed to make the solution

(2 X 5 = 10 Marks)

- c) List and describe **two (2)** ingredients added to synthetic detergents and their usefulness in laundry.

(5 Marks)

[TOTAL MARKS = 30]