

General Certificate of Education  
June 2005  
Advanced Level Examination



**HOME ECONOMICS**  
**Unit 7 Textiles Science and Technology**

**HEC7**

Monday 20 June 2005 Afternoon Session

**In addition to this paper you will require:**  
an 8-page answer book

Time allowed: 1 hour 30 minutes

**Instructions**

- Use a blue or black ink (or ball-point) pen. Pencil should only be used for drawing.
- Write the information required on the front of your answer book. The *Examining Body* for this paper is AQA. The *Paper Reference* is HEC7.
- Answer **two** questions.
- Fasten any supplementary sheets you use to the answer book before handing it to the invigilator at the end of the examination.

**Information**

- The maximum mark for this unit is 50. Mark allocations are shown in brackets.
- The number of marks is given in brackets at the end of each question or sub-question.
- You will be assessed on your ability to use an appropriate form and style of writing, to organise relevant information clearly and coherently, and to use specialist vocabulary, where appropriate. The degree of legibility of your handwriting and the level of accuracy, punctuation and grammar will also be taken into account.

Answer **two** questions only

Each question carries 25 marks.

1 Explain what is meant by each of the following and discuss their importance when manufacturing textile products:

- (a) melt spinning; *(5 marks)*
- (b) fibre-reactive dye; *(5 marks)*
- (c) worsted yarn; *(5 marks)*
- (d) non-woven fabric; *(5 marks)*
- (e) fleece fabric. *(5 marks)*

2 (a) What do you understand by the term linear density when it is used to describe the dimensions of textile yarns? *(5 marks)*

(b) If 500 metres of polyamide yarn weighed 500 milligrammes, calculate the linear density of the yarn in tex units. *(3 marks)*

(c) A yarn 100 centimetres long had a 50 gramme weight attached to it and the new length of the yarn was 110 centimetres. When the weight was removed the yarn was 102 centimetres long. Calculate:

- (i) the percentage extension; *(3 marks)*
- (ii) the percentage elastic recovery. *(3 marks)*

(d) The following table shows information obtained from an experiment designed to investigate the moisture absorbing properties of wool and polyamide.

<b>Fibre</b>	<b>Weight of sample (g) at 20°C and 65% relative humidity</b>	<b>Weight of sample (g) at ambient conditions</b>	<b>Oven dry weight (g) of sample</b>
<b>Wool</b>	5.20	5.40	4.53
<b>Polyamide</b>	6.40	6.60	6.11

- (i) Define Standard Moisture Regain (SMR) and Standard Moisture Content (SMC). *(2 marks)*
- (ii) Using the data in the table, calculate the standard moisture regain (SMR) and standard moisture content (SMC) for **both** fibres. *(4 marks)*

(e) Briefly explain why polypropylene fibres have a value of zero for standard moisture regain. *(5 marks)*

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3 Explain how the following compounds are used to improve the properties and quality of textile fibres and fabrics.

- (a) Proban; (5 marks)
- (b) DMDHEU; (5 marks)
- (c) mordants; (5 marks)
- (d) PTFE; (5 marks)
- (e) hydrogen peroxide. (5 marks)

4 Explain each of the following statements:

- (a) cotton, cellulose acetate and cellulose triacetate have different moisture regain values; (5 marks)
- (b) cotton and polyamide (nylon) staple fibres have very different physical properties; (4 marks)
- (c) linen is difficult to blend with other fibres; (4 marks)
- (d) wool and silk have different properties even though they are protein fibres; (4 marks)
- (e) a tightly woven 100% polyamide filament blouse can be very uncomfortable in summer. (4 marks)
- (f) detergents which do not contain enzymes often fail to remove stains which contain blood, egg, sweat etc. (4 marks)

**END OF QUESTIONS**

**THERE ARE NO QUESTIONS PRINTED ON THIS PAGE**