



2nd SEM. 2014/2015

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UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

**PROGRAMME : BACHELOR OF SCIENCE IN
TEXTILE, APPAREL DESIGN AND
MANAGEMENT YEAR III**

COURSE CODE : TADM 307

TITLE OF PAPER : COLOURATION TECHNOLOGY

TIME ALLOWED : TWO (2) HOURS

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

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GRANTED BY THE CHIEF INVIGILATOR**

QUESTION 1 (COMPULSORY)

a) Coloured fabric is required to maintain its colour i.e. have good colour fastness. To determine the effectiveness of the colouration processes, you are requested to suggest and describe **one (1)** necessary colour fastness test for the following end use fabric applications. Justify your answer.

- i) The new soccer kit for Manzini Sundowns
- ii) New office curtain drapes for a company situated at the Matsapha industrial site.

(2 X 5 = 10 Marks)

b) Two samples of cotton fabric were dyed using reactive dyes. All the dyebath parameters were constant for both fabric samples except that fabric B was further treated with chitosan while fabric A was untreated. Based on the data given on the table below, interpret the results and draw conclusions with regards to the following for each of the fabrics (i.e. A and B). Tabulate your answer.

Fabric type (code)	K/S Value (at 540nm)	Exhaustion %	Rubbing fastness (wet)	Washing fastness (colour change)	Colour staining	
					Cotton	Acrylic
A (<i>untreated fabric</i>)	2.5	22	4/5	4/5	4/5	4/5
B (<i>treated fabric</i>)	16	60	3	3	4/5	3

- i) Dye absorption
- ii) Colour depth
- iii) Wash fastness
- iv) Rubbing fastness
- v) Colour staining

(5 x 3 = 15 Marks)

c) Based on the conclusions made in (c), make a recommendation with regards to the treatment used in fabric B.

(5 Marks)

d) Polyester fibres are not easy to dye but can be dyed using disperse dyes. Explain the process of dyeing polyester fibres with disperse dyes.

(10 Marks)**[TOTAL MARKS = 40]**

QUESTION 2

- a) Using a dye source material of your choice fully describe the method you would use for dye extraction.

(6 Marks)

- b) Define the following attributes of colour in relation to identifying a colour.

- i) Hue
- ii) Chroma
- iii) Lightness

(3 x 4 = 12 Marks)

- c) A number of fabric colouration problems may result from poor colour fastness. Mention and describe **four (4)** possible colour problems.

(4 x 3 = 12 Marks)

[TOTAL MARKS = 30]

QUESTION 3

- a) A cotton fabric was successfully dyed with a dye extracted from marigold flowers. Upon rinsing the fabric after dyeing, all the dye was washed off the cotton cloth leaving a slight shade of yellow. Explain the possible cause for this and how it can be rectified

(3 Marks)

- b) Colour is a key element of consumer buying decisions e.g. when purchasing fabric for school uniforms in order to maintain colour consistency. Give and describe **two (2)** types of equipment that can be used to ensure this.

(8 Marks)

- c) Sibusiso tie-dyed a white polyester cloth using red reactive dye. Upon completion of the dyeing process, he observed that the polyester cloth was not dyed. Attribute a reason to this failed colouration process.

(3 Marks)

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- d) Calculate dye exhaustion percentage when the concentration of dye in the dye-bath initially was 50 and 10 after the dyeing process.

(6 Marks)

- e) Compare and contrast natural dyes and synthetic dyes by highlighting the advantages and disadvantages of each.

(10 Marks)

[TOTAL MARKS = 30]

QUESTION 4

- a) Describe the process by which colour is applied to fabric when using vat dyes.

(6 Marks)

- b) Human colour vision is both tristimulus and opponent in nature. Qualify this assertion.

(6 Marks)

- c) Explain the role of the following auxiliary agents in a printing paste.

- i) Hygroscopic agents
- ii) Thickeners
- iii) De-foaming agents
- iv) Wetting agent

(3 x 4 = 12 Marks)

- d) Fully explain why the TQM textile factory in Matsapha opted for the winch dyeing machine to dye their knitted fabrics instead of the jig dyeing machine which is more economical.

(6 Marks)

[TOTAL MARKS = 30]