



METHODIST
LADIES'
COLLEGE

**Methodist Ladies' College
ATAR course examination, Semester 2, 2019**

**Question/Answer Booklet
SOLUTIONS**

**MATERIALS
DESIGN AND
TECHNOLOGY
ATAR Year 11
Sections One, Two and Three**

Student Name: _____

Teacher Name: _____

Time recommended for these sections

Reading/planning time before commencing work: Ten minutes

Working time for these sections: Two hours

Materials required/recommended for this paper

To be provided by the supervisor

This Question/Answer Booklet

To be provided by the candidate

Standard items: pens (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters

Special items: non-programmable calculators approved for use in this examination

Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised material. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of written examination	Your Mark
Section One Short answer	2	2	15	10	10	
Section Two Extended answer	3	3	30	20	20	
Section Three Textile specific content	6	6	75	70	70	
Total					100	

Instructions to candidates

1. The rules for the conduct of ATAR course examinations are detailed in the *Year 11 Information Handbook 2019*. Sitting this examination implies that you agree to abide by these rules.
2. Write your answers in this Question/Answer Booklet.
3. Answer the questions according to the following instructions.
Sections One and Two: Answer **all** questions.
Section Three: Answer all of the questions within your specialised field: Textiles.
4. You must be careful to confine your responses to the specific questions asked and to follow any instructions that are specific to a particular question.
5. Additional working space pages at the end of this Question/Answer booklet are for planning or continuing an answer. If you use these pages, indicate at the original answer, the page number it is planned/continued on and write the question number being planned/continued on the additional working space page.

This section has **TWO (2)** questions. Answer **all** questions. Write your answers in the spaces provided.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue with your answer.

- Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
- Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of questions that you are continuing to answer at the top of the page.

Suggested working time: 15 minutes

Question 1.

5 marks

This question is about **decorative effects**.



cotton carry bag



wooden chest



metal tool box

- a) Select an item specific to the context you are studying from the items above and describe an **appropriate decorative effect** that could be applied to this item:

Name of item: **Tote Bag** (1 mark)

I. Name of decorative effect: _____ (1 mark)

Possible suitable decorative techniques: 1 mark

Patchwork – Reasons: secure and strong; easily cleaned, colourful patterns can be achieved,

Applique – Reasons: secure and strong; colourful patterns can be achieved,

Screenprint - Reasons: secure and strong; easily cleaned, colourful patterns can be achieved,

b) Description of decorative effect: _____ (1 mark)

clear description 1 mark

Question 1 continued

- c) Explain in detail giving **TWO (2) reasons** why this is an appropriate decorative effect for the item chosen (2 marks)

Two suitable reasons given eg. easily cleaned, colourful patterns can be achieved, secure decorative effect, strong and durable. Hard wearing as it will get a lot of use. 2 marks

Question 2

5 marks

Describe how **designing, production planning and ongoing evaluation** processes work together to contribute to the development of a successful design.

A clear description of the processes used and explains how they work together to ensure best results. 5 marks

Designing enable a wide range of ideas to be researched, generated and explored and evaluated by the user / client in order to make best choices and decisions. Designing is the illustration aspect of the process.

Production planning enable best choices to be made regarding materials to use, costing, and safe and efficient production processes to be employed and planning using a time frame / schedule for manufacturing deadlines. Detailed planning enables manufacturers to read and use detailed specifications for a product – ensuring the final product meets the specifications of the designer, the client and the user. Ongoing evaluation of product and processes eg using client and market feedback, materials testing, toiles and samples can enable best decisions to be made for the best quality / and likely to be most successful product to make and market.

End of Section 1.

See next page

Section Two: Extended Answer

20 marks

This section has **TWO (2)** questions. Answer **all** questions. Write your answers in the spaces provided.

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Suggested working time: 30 minutes

Question 3.

8 marks

This question relates to the Alessi Bird Whistle Stovetop Kettle illustrated below. This kettle is made in Italy from the best quality mirror polished stainless steel.



Explain how **FOUR (4) of fundamentals** have been used in the design of the Alessi Bird Whistle Stovetop

the following design used in the design of the Alessi Kettle.

- Aesthetics
- Functional
- Social
- Economic
- Environmental
- Safety

a) Design Fundamental: _____

(2 marks)

Explain how this fundamental has been used in the design of the Alessi Bird Kettle:

Identifies four correct design fundamentals and explains how each has been used - using a specific example on the kettle 2 marks each

See next page

Examples:

Aesthetics – feature colour blue has been used on the handle, colour red has been used on the bird whistle

Functional – bird whistle to indicate when the water has boiled, blue plastic handle with finger shapes to ensure good grip

Social – overall use of beautiful materials and an unusual shape and features to appeal to a designer audience

Economic – most likely expensive – aimed at a designer audience

Environmental -

Safety – finger shaped handle for strong safe hand grip, moved back away from the kettle pouring spout to reduce chance of steam burns. Bird whistle to ensure kettle is turned off when boiled, large black knob on the kettle lid easy to grip

Question 4.

12 marks

Designers have a responsibility for the environmental consequences of the products they design.

Identify and discuss **SIX (6) issues** a designer will need to address when evaluating the environmental impact of each of the following:

- (i) The materials used - identifies and discusses four relevant points (4 marks)

Generally a designer will need to address the environmental impact of the materials used to produce their products and the environmental impact of the product itself during its life cycle.

Environmental impact of the materials used:

- The material's production – could include transport and removal energy requirements.
- Does the textiles production process create physical damage to local environments – water, soil, atmosphere, habitats and flora?
- Material production – does it have major environmental issues?
- Are waste materials from the textile production process able to be disposed of efficiently or will they be an environmental hazard?
- Need to question the environmental efficiency of the textile production process due to location/country.
- Atmospheric environmental issues such as greenhouse gases or other pollutant expelled into the air during material production/processing.
- Does the process have high energy demands – electricity, coal, petroleum based products?
- Will the material have long term health effects on users?
- Can the material be efficiently recycled?
- Alternately, can the material be replaced by less polluting and more efficient materials – substitute material?
- Does the transportation of the material from distant locations create further environmental issues outweighing cost savings?
- Can the material be re-used more than once?
- Is the material bio-degradable?

- (ii) The production process - - identifies and discusses four relevant points (4 marks)

- a. Are waste materials from the production process able to be disposed of efficiently or will they be an environmental hazard?
- b. Need to question the environmental efficiency of the production process due to location/country.
- c. Atmospheric environmental issues such as greenhouse gases or other pollutant expelled into the air during production/processing.
- d. Does the transportation of the product from distant locations create further environmental issues outweighing cost savings?
- e. Does the manufacturing process have high energy demands – electricity, coal, petroleum based products?

See next page

(iii) The product - identifies and discusses four relevant points

(4 marks)

Environmental impact of products:

- Are the materials used to make the product the most environmentally efficient?
- Are there carcinogenic or toxicity issues with various materials used to product the item – dyes, etc?
- Is the product efficient in its use of energy?
- Are there pollutants emitted during product manufacture?
- Is the product a need or want – if a 'want' it will inherently have environmental issues?
- Has the product a short or long life cycle – longevity?
- Will the product require regular maintenance, repair which will require additional materials and energy adding to environmental issues?
- Are there waste materials produced during the products manufacture and can they be recycled or reused?
- Will the product itself create environmental issues?
- When in use?
- Can it be disposed of?
- Can it be recycled?

End of Section Two

Section Three: Textiles Specific Context

70 marks

This section has **SIX (6)** questions. Answer **all** questions. Write your answers in the spaces provided. Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue and answer.

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Suggested working time: 75 minutes

Question 5

6 marks

This question is about **the value of textiles in society**. Using the collage of images shown below, identify **THREE (3) factors that contribute to textile value in society** today. Using at least **ONE (1) example**, describe in detail how each factor contributes to textile value.



Question 5 continued

(a) Factor 1: _____ (2 marks)

Describe how this factor contributes to textile value in society.

Value of Textiles in Society:

Perceived value: evaluation of worth of a textile item, expensive products

Heirloom: a textile item passed down from generation to generation – sentimental value – eg. christening gowns

Vintage: niche market – fashion from historical decades of fashion – eg. 1950s glamour gowns

Handcrafted: hand made pieces – usually one of a kind, not mass produced eg. hand knitted and crocheted shawls, beanies and jumpers

Unique – one off pieces – distinctive, quirky pieces eg. designer T shirts,

Designer label – wearing a designer label has high prestige in society today eg. Armani, Gucci

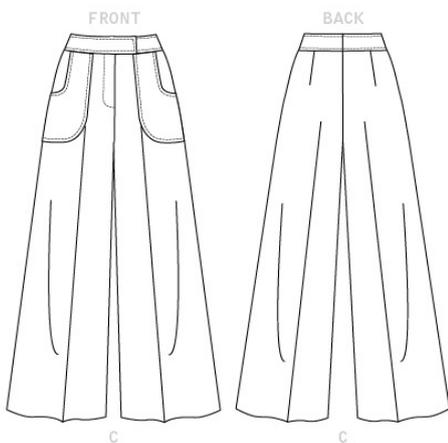
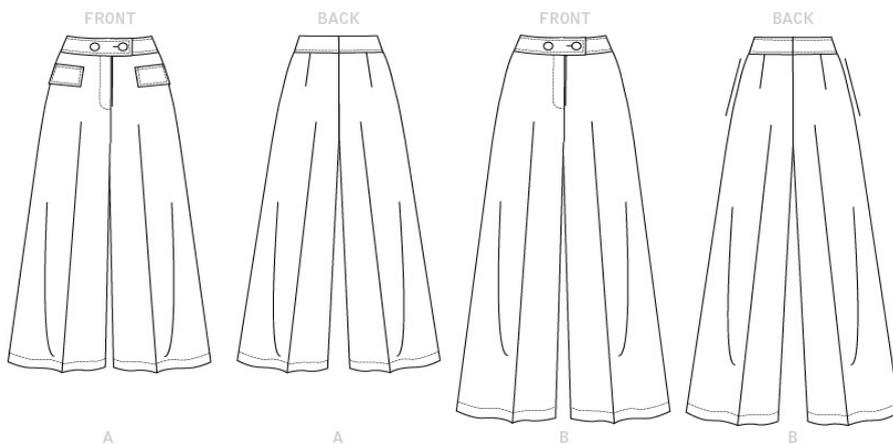
Technological advanced textiles – functional / performance based textiles with specific industry uses – eg. military, marine, medical, space, automotive

Cultural value – culture textiles for weddings, births, funerals , eg. saris, sarongs,

Question 6.

24 marks

Refer to VOGUE pants pattern V9361 **View A** below for all parts of Question 6.



See next page

Question 6 continued.

FABRICS: Unsuitable for obvious diagonals.

*With Nap. **Without Nap. Gabardine, Crepe, Denim.

Note: Fabric requirement allows for nap, one-way design or shading. Extra fabric may be needed to match design or for shrinkage.

NOTIONS: A, B: Three 1" (2.5 cm) Buttons. **C:** Three Pairs of Hook & Eyes.

Size Combinations: **A5(6-8-10-12-14) E5(14-16-18-20-22)**

Fabric widths given in centimetres.										
SIZES	6	8	10	12	14	16	18	20	22	
View A										
115 cm ^{*/**}	2.1	2.1	2.1	2.4	2.4	2.4	2.4	2.4	2.4	m
152 cm ^{*/**}	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	m
FUSIBLE INTERFACING A - 46, 51 cm - 0.8 m										
LINING A - 115 cm - 0.3 m										
View B										
115 cm ^{*/**}	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.7	m
152 cm ^{*/**}	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	m
FUSIBLE INTERFACING B - 46, 51 cm - 0.7 m										
LINING B - 115 cm - 0.5 m										
View C										
115 cm ^{*/**}	2.6	2.6	2.6	2.6	2.9	2.9	2.9	2.9	2.9	m
152 cm ^{*/**}	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	m
FUSIBLE INTERFACING C - 46, 51 cm - 0.8 m										

(a) Using textiles specific terminology, describe the **styling** used in this pant design. (2 marks)

Four correct terms - ½ mark each (2 marks)
 Culotte style pant. ¾ length, dart shaped back, topstitched and shaped waistband, topstitched pocket flaps, fly front closure, double front button closure

Question 6 continued

(b) What is the name given to the **shaping** technique used to shape the culotte pant to fit the waistline? (1 mark)

Darts or Shaped waistband

- (c) The culotte pant requires a **closure**. Recommend a **closure** that would be suitable and suggest the most appropriate location for the closure. Justify your answer. (2 marks)

Lapped zipper application / fly zipper closure – centre front seam

- (d) Suggest the most appropriate type of **joining and finishing** techniques to use when producing the culotte pant. Justify your answer. (3 marks)

Name of **joining** technique: **open seam 1 mark**

Name of **finishing** technique: **overlocker neatened 1 mark**

Justification of techniques: **crotch seam – open seam reduces bulk and provides greater comfort – also enables the zipper closure to be inserted in the fly front . 1 mark**

- (e) Name and describe the process by which **the bulk** created at the join between the waistband and the culotte pant can be reduced. (2 marks)

Trimming the seams , clipping curves, gading the seams – trimming to different widths

- (f) How much fabric would you need to purchase to make View A, size 14 culotte pants? (2 marks)

Fabric width is 150cms wide: 2.10 metres

What is an ideal fabric to make these culotte pants?

Gabardine, Crepe or Denim.

- (g) How much lining fabric would you need to purchase to make View A, size 14 culotte pants? (2 marks)

Lining fabric width is 115cms wide: **0.3 metres**

What is an ideal fabric to line these culotte pants? **Bemsilk lining, Taffeta , Ployester lining**

- (h) Fusible interfacing is required for the culotte pants. (3 marks)

How much interfacing would you need to purchase?

Interfacing fabric width is 115cms wide: **0.8 metres (58cms wide) or 0.4 x 115cms wide**

Where will the interfacing be used? **Waistband and pocket flaps**

What is an ideal interfacing fabric for this purpose? **Fusible medium weight Vilene / Pellon**

(i) What notions are required to finish the culotte pants? (1 mark)

3 x 2.5cms wide buttons

(j) Using the culotte pattern pieces as a reference on page 26, arrange the pieces economically and correctly on the fabric layout below. (6 marks)

see attached – 1 mark for each correct pattern piece placement

Question 7

10 marks

Amanda requires **two lined straight legged trousers** to wear to her new job as a lawyer. She has decided to make them herself and has a budget of \$125 to make both pair of trousers.

The requirements for each trouser are as follows:

- 2.2 metres of fabric
- 2 metres of lining
- 20cm of interfacing
- 1 reel of thread
- 1 zip

Choose the most suitable trouser fabric for Amanda to use from the information about fabrics in the table below.

Information About Fabrics			
	Fabric/fibre type	Cost per metre / unit	Care instructions
A	Cotton Polyester Gabardine Suiting	\$18	<ul style="list-style-type: none"> • Machine washable • Line or tumble dry • Moderate iron • Do not bleach • Dry cleanable
B	Polyester, Viscose and Elastane Suiting	\$20	<ul style="list-style-type: none"> • Machine hand-wash in a laundry bag in cool water • Do not tumble dry • Cool iron • Do not bleach • Dry cleanable
C	Cotton Drill	\$10	<ul style="list-style-type: none"> • Machine washable • Hot iron • Wash in cold water • Line or tumble dry • Do not bleach • Do not wash with whites
D	Bemsilk Lining	\$5	<ul style="list-style-type: none"> • Machine washable • Line or tumble dry • Do not bleach • Moderate iron • Dry cleanable
			<ul style="list-style-type: none"> • Machine washable • Wash in warm water

See next page

E	Interfacing	\$5	<ul style="list-style-type: none"> • dry cleanable • Line or tumble dry on low • Medium iron
F	Zips	\$2 each	<ul style="list-style-type: none"> • Washable • Colour fast
G	Thread	\$4.20 each	<ul style="list-style-type: none"> • Washable • Colour fast

Question 7 continued

Trouser fabric chosen: Cotton Polyester Gabardine Suiting

JUSTIFY your choice of fabric – Explain **FOUR (4) reasons** for your choice of fabric. (4 marks)

Four different reasons identified - 1mark each

Moderate cost at \$18 / metre

Cotton / Polyester blend is wrinkle resistant, strong, durable and hard wearing twill weave fabric

Cotton / Polyester blend is cool, breathable,

Cotton / Polyester blend is machine washable, line or tumble dry, moderate iron

Cotton / Polyester blend is dry cleanable

(a) Calculate the total cost of making **both trousers** in the spaces provided below. (6 marks)

	Cost per metre / unit	Number of metres / units	Cost
Fabric	\$18/m	4.40 metres	79.20
Lining	\$5/m	4 metres	20.00
Interfacing	\$5/m	0.40 metres	2.00
Thread	\$4.20	2 reels	8.40
Zip	\$2	2 zippers	4.00
Total cost			\$113.60

Question 8.

Blends, composites and alloys are created when different materials are combined.

10 marks

a) Explain why **materials are created in this way.**

(2 marks)

To create a new material (fabric) that demonstrates the best properties of each of the contributing fibres

A blend is created specifically to meet an end - use application.

To be competitive in the textile market place – a blend must offer superior end-use quality than that of the single fibre, yarn or fabric counterpart.

Economy – to reduce the cost by blending an expensive fibre with a cheaper fibre

To provide the best combination of advantageous fibre properties

To add colour as some fibres have a greater affinity to dye

To add decorative effect Eg.lustre, texture

Fibres, yarns and fabrics with a more beneficial set of performance characteristics

An improvement in the quality of a fabric, meeting specific end – use requirements such as performance, comfort, ease of care.

A better texture, hand or appearance such as the addition of colour or lustre or the production of a fancy effect yarn that adds value to the aesthetics of a yarn or a fabric

b) Identify **TWO (2) different ways in which blends are made in the Textiles industry.**

(3 marks)

Identifies and describes two of the blend types shown below. 3 marks each

Three different types of blends

a. Intimate Blend

- i. when two or more different fibres are combined to form a uniform mixture before the single yarn is spun.
- ii. they can not be separated.
- iii. Both fibres are visible when you look under the microscope.
- iv. Cotton / Polyester blend is a very common intimate blend.



b. Mixture blend

- i. a mixture of fabric uses a combination of yarns.
- ii. For example: one type of fibre is used for the warp and another is used for the weft.
- iii. For example: when two different yarns are knitted together



c. Combination blend

- i. in a combination blend, ply yarns are used.
- ii. For example : core sheath yarn of elastene and nylon blended together to form yarns or fabrics with greater elastic performance properties.
- iii. at least one component of the ply yarn is different to the other components of the yarn
- iv. This method is used for:
- v. Nylon / Lycra swimwear and sports clothing
- vi. Bra fabrics



- c) Identify **TWO (2) successful fibre blends** that are commonly used in Textiles. (2 marks)

Fibre Blend 1: Polyester / Cotton Blend – mens shirts

Fibre Blend 2: Nylon / Elastomeric blend – swimwear

Other fibre blends are acceptable.eg. Wool / Nylon, Silk /Wool / Nylon, Wool/ Nylon/ Elastomeric,

Question 9

10 marks

Consider the **environmental impact throughout the product life cycle of the men's Denim jeans** shown below. The main material used in the garment is a **100% Cotton**.

In your answer you should consider the following:

- Growth of the Cotton fibre
- Manufacture of the Cotton denim fabric
- Strategies for minimising waste during manufacturing and at the end of life of the garment
- Use of water and energy
- Pollution and waste management



See next page

Question 9 continued

Identifies and describes the impact of at least 2 major points in each aspect of the product life cycle of jeans. Below are listed the many environmental impacts of Cotton fibre / Denim Jeans

2 marks each for 5 different points discussed

(i) Growth of the Cotton fibre used to make Denim jeans

Cotton fibre growth stage

- *Uses finite energy and water resources*
- *Displaces land for crops – no land for growing food crops*
- *Leaches nutrients from soil*
- *Contaminates soil and water through use of pesticides, herbicides and biocides*
- *Weakens crop strains*

Cotton fibre harvesting stage

- *Defoliant chemicals (herbicides) are borne by air – a human health hazard*
- *Significant use of defoliant chemicals*
- *Fuel powered machinery uses water, fuel and energy*

(ii) Manufacture of the Cotton Denim fabric used to make Denim jeans

Fibre cleaning stage

- *Use of strong chemicals*
- *Cotton solid waste to landfill*
- *Water pollution by detergents, bleaches*
- *Chemicals used to clean cotton fibres*
- *Fuel emissions from machinery used*
- *Noise and dust emissions*

Fibre spinning stage

- *Dust and noise emissions*
- *Loose fibres breathed in*
- *Noxious fumes into environment*
- *Solid wastes eg. cones and pallets*

Fabric production stage

- *Uses finite energy and water resources*
- *Dust and noise emissions*
- *Releases fumes from chemicals used*
- *Dyeing by products released into water ways*

Finishes applied to fabrics to create Denim washed looks eg stonewashed Denim

- *Toxic by – products and fumes from chemicals, metals dyes and resins*
- *Handling health hazards*
- *Storage of waste products eg. used dyes*
- *Uses finite energy and water resources*

(iii) Strategies for minimising waste during manufacturing and at the end of life of the garment

Garment production stage – environmental impacts

- *Waste from off-cuts*
- *Dust and lint*
- *Health hazards through handling of fabrics and other processed products*

See next page

- *Chemical residues from application of finishes eg. water proofing*
- *Dry cleaning uses chemicals*
- *Solid wastes – packaging, inks, plastics, hangers*
-

Question 9 continued

Distribution and transportation of goods – environmental impacts

- *Transportation uses finite fuel resource*
- *Transportation causes air pollution*

Consumer use and Disposal Stage

- *Solid wastes eg packaging*
- *Excessive consumption due to frequent changes in fashion*
- *Emissions from waste incineration and / or dumps*
- *Cleaning and and laundering of products – washing, dry cleaning – chemical, water and energy use*

Strategies to minimise waste

- *Computerised cutting layouts to maximise use of fabric*
- *Recycling of fabric waste into embellishments and accessories*
- *Recycling / upcycling used denim jeans into new garments*
- *Minimise the use of chemical residues from bleaching, dyeing, printing and all special finish treatments applied to denim*
- *Minimise disposable packaging and labelling waste*

(iv) Use of water and energy

- *Introduce water and energy audits to minimise water use and energy use*
- *Introduce water and energy efficiency measures – reduce waste of water and energy in processing, manufacturing and finishing of denim jeans*
- *Reusable dye baths and exhaust dye baths – use insulation to maintain heat in dye baths and low liquor dye baths and better dye fixation methods; or cold water dyeing processes*
- *Digital dyeing of fabrics to reduce dye by products*
- *Treat / clean waste water before disposal or reuse*

(v) Pollution and waste management

- *Control and minimise solid waste disposal from manufacturing*
- *Recycle solid wastes into embellishments and accessory items and smaller products*
- *Monitor and minimise air, water and land pollution from processing, manufacturing and finishing of denim jeans.*
- *Reduce solid wastes from packaging and labelling*
- *Laundering of products – washing, dry cleaning – chemical, water and energy use*

Question 10

10 marks

Analyse the image of the winter school skirt shown below.

The school skirt is made from a Gabardine fabric. The Gabardine fabric is made from a fibre blend - the fibre composition of the Gabardine fabric is 70% Wool / 20% Nylon / 10% Lycra



See next page

Question 10 continued

- a) Identify **TWO (2) fabric finishes** that would have been used in the **production of the Gabardine fabric and / or the manufacture of the school skirt.**
- b) Explain the **function of the finish** in relation to the Gabardine school skirt.

Fabric Finish 1:

Function of the Finish:

Some possible fabric finishes to identify and explain include: 5 marks each

SIZING - fabric immersed in mixture containing waxes, oils, glycerine and softeners to add or control fabric body

PLEATED - made using a variation of embossing—

- pattern paper (hand)—produces wider variety of pleated designs
- machine process—blades pleat fabric as inserted between two heated rolls

BLEACHING – cleaning and whitening of the wool fabric before dyeing

DYEING - colouration—colour normally added at the fabric stage

CALENDARING—mechanical finish performed by series of rollers between which fabric passes; simple, friction, moire, schreiner, embossing

CARBONISING—treatment of wool yarns or fabrics with sulfuric acid; destroys plant matter and allows for more level dyeing

CRABBING—finishing process used to set wool fabrics; immersed in hot water then cold water & passed through rollers achieved with combination resin treatments to impart durable-press characteristics & control excessive shrinkage

DURABLE PRESS WOOL – shrinkage control, achieved with combination resin treatments to impart durable-press characteristics & control excessive shrinkage

PERMANENT PRESS / PLEATING – Eg. **PLEATING** – chemical treatment to retain pleats

MOTH PROOFING - protect fabrics from attack by moths

End of Section 3

See next page