



Methodist Ladies' College  
ATAR course examination, Semester 2, 2019  
Question/Answer Booklet  
**SOLUTIONS**

**MATERIALS**  
**DESIGN AND**  
**TECHNOLOGY**  
ATAR Year 12  
Sections One and Two

Student Name: \_\_\_\_\_

Teacher Name: \_\_\_\_\_

**Time allowed for this paper**

Reading time before commencing work: 10 minutes

Working time: 2 ½ hours

**Time recommended for these sections**

Suggested working time for these sections: sixty minutes

**Materials required/recommended for this paper**

***To be provided by the supervisor***

This Question/Answer Booklet

Number of additional  
answer booklets used  
(if applicable):

***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 the examination

The Materials Design and Technology ATAR course examination consists of a written component and a practical (portfolio) component.

## 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	3	3	20 mins	14	14%	
Section Two Extended answer	3	3	40 mins	26	26%	
Section Three Candidates to choose <b>one</b> of the following contexts:						
Wood	-	-	-	-	-	
Metal	-	-	-	-	-	
<b>Textiles</b>						
<b>Total</b>					100	

## Instructions to candidates

- The rules for the conduct of ATAR course examinations are detailed in the *Year 12 Information Handbook 2019*. Sitting this examination implies that you agree to abide by these rules.
- Write your answers in this Question/Answer Booklet.
- Answer the questions according to the following instructions.  
  
Sections One and Two: Answer **all** questions.
- 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.
- Supplementary pages for the use of planning/continuing your answer to a question have been provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued i.e. give the page number.

## Section One: Short answer

14 Marks

This section contains **THREE (3) questions**. Attempt **ALL** questions from this section.

**Suggested working time: 20 minutes**

**Question 1****6 marks**

'The Cactus' in Perth City was unveiled in 2011 and was designed and created by artist James Angus.

With reference to the image below, identify **THREE (3) elements** and **THREE (3) principles of design** and explain how each of the elements and principles has been used successfully in this sculpture



1 Mark for each correct element with a description of how it has been used

Elements:

Colour – monochromatic green light and dark, value

Line – lines of different lengths, short and long, repetition of lines

Shape / Form – one shape repeated numerous times

Texture – shiny and smooth textures

1 Mark for each correct principle with a description of how it has been used

Principles:

Proportion – oversized shapes, larger than the proportion of the buildings and people

Rhythm – created by the repetition of the shapes

Repetition – four shapes repeated to create rhythm

Balance – asymmetrical balance on each totem shape

Emphasis / Dominance – no real area of dominance – perhaps that they are joined in the centre area

**See next page**

Harmony -  
Unity

(1 mark)

**Question 2**

**4 marks**

This question is about manufacturing techniques.

Complete the table below to contain the following information.

- a) Identify **TWO (2) different joining techniques** you might use in the construction of a product.
- b) List **ONE (1) specialised piece of equipment or machinery** needed to complete the joining technique.
- c) Identify **ONE (1) advantage** and **ONE (1) disadvantage** of using each joining technique.

Name of the joining technique	Open seam Closed seam	French seam Flat seam
Specialist equipment or machinery required	Sewing machine Overlocker Steam iron	
Advantage	Open seam – reduces bulk  Closed seam – quick to make - Stops freying	French seam - Totally enclosed seam - Does not frey - Suits babies / childrens clothing - Suits evening gowns – organza and chiffon  Flat seam - Totally enclosed seam - Suits denim jeans - Work clothes - Hard wearing. Does not frey
Disadvantage		French seam/ Flat seam  - Takes skill and a long time to make it

### Question 3

4 marks

Designers at FREEDOM furniture are creating a new range of outdoor furniture incorporating three different materials: wood, metal and textiles. The outdoor lounge shown below will be marketed in Australia in Summer 2020.



- a) In relation to your context area of study, identify **ONE (1) finish** that could be used to **protect** this product in the **outdoor environment** to which it will be exposed. Explain the **function of the finish**. (2 marks)

Identifies and explains a suitable finish - 2 marks

Examples:

UV Protective finish – protects against UV sun damage

Water repellent / waterproof finish eg Scotchguard, Teflon – water proof, prevents staining

Flame proof / flame retardant -

Outlines advantage 1 mark / disadvantage 1 mark

Antimicrobial finish – anti-mildew finish

### End of Section One

### Section Two: Extended Answer

26 Marks

This section has **THREE (3) questions**. Answer **all** questions. Write your answers in the spaces provided.

**Suggested working time: 40 minutes**

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### Question 4

8 marks

A small-scale manufacturer was visited by Work-Safe and deemed to be non-compliant with a number of Occupational Safety and Health rules and regulations.

- a) Outline **TWO (2) benefits to employers** and **TWO (2) benefits to employees** of complying to Occupational Safety and Health standards. (4 marks)

Identifies 2 benefits to employers: 2 marks

- Improved morale of workers
- Reduces accidents / injuries of employees

See next page

- Reduced workplace disruptions
- Improved productivity of workers
- Improved competitiveness with other workplaces
- Reduced costs related to worker's compensation claims, replacement labour, lost work time, fines and legal penalties.

Identifies 2 benefits to employees: 2 marks

- Higher morale – happier work place - satisfaction of workers
- Safer work environment - reduced injuries
- Work continuity – improved income
- More productive – higher job satisfaction

b) Identify and discuss **FOUR (4) strategies** a textiles manufacturer could implement to establish and maintain a safe work culture and environment for employees. (4 marks)

- Identifies and describes 4 strategies to improve safe work culture from those listed below 1 mark each ( list is not exhaustive)
  - Safe systems of work:
    - information, instruction, training and supervision;
    - consultation and co-operation;
    - provision of personal protection equipment PPE, and safe plant and substances.
  - System for reporting of fatalities, injuries and disease
  - Good lighting to reduce eye strain.
  - Well ventilated areas – to reduce fibre, dust and vapours inhalation
  - Appropriate ergonomic furniture – eg. Correct height of desk and chair –for comfort and to reduce strain on the body
  - Power cords kept free of sewing and cutting areas
  - Appropriate dress standards for work enforced – closed shoes, hair tied back, no loose clothing worn
  - Fingers kept away moving parts of all machines and electrical appliances eg. from overlocker blades and needles
  - Safety guards used where applicable on machines eg. overlocker, electrical powered cutters, rotary cutters
  - Keep work areas clean and uncluttered to prevent items getting caught in the machine
  - Avoid contact with wet areas to prevent electrical shock
  - Industrial Machines may require use of PPE (Personal Protection Equipment):
    - Safety glasses to prevent materials from entering eyes
    - Ear muffs to reduce damage to hearing
    - Dust and ventilated masks to reduce inhalation of fibres, dust and vapours

### Question 5

8 marks

This question is about the Design Process.

- a) List **FOUR (4) methods** a designer may use to communicate their design ideas to their client. (2 marks)

Lists 4 techniques for communication ½ mark each

- Brainstorms
- Inspiration pages
- Rapid concept sketches

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- 2D working drawings
- 3D fashion illustrations, storyboards
- Design specification sheets

- a. Describe how a designer might use **client feedback** to improve the design of a product before creating a prototype for the client.

Describes how designer can improve designs using client feedback – create new sketches, designs, samples, prototypes to show client before finalising and agreed final design. 3 marks

- b) Identify and describe how designers can utilise **market research** to inform the design development of a new product.

Describes market research techniques  
Interviews, questionnaires, surveys, internet feedback,  
Can show inform trends/direction for design development  
Design what consumers / clients want 3 marks

### Question 6

(10 marks)

**Design specification sheets** are prepared by the designer before a new product can be manufactured. A **working or technical drawing** is always included on a design specification sheet.

- a) Describe the **details** that must be included on a **working or technical drawing**.  
(2 marks)

Details must include:

2D drawing to scale / proportions  
Pencil or fine liner drawings – technical – drawn with a ruler  
Measurements of components  
Annotation to describe features

- b) What is the **purpose of including a working drawing** on a design specification sheet?  
(2 marks)

Precise / specific design features are shown, annotation to describe the piece,  
Communicates design specifications to pattern maker, sample maker,

- c) List **THREE (3) other pieces of information** you would expect to find on a design specification sheet for a product from your context area and explain why these are important.

2 marks for each additional piece of information described:

- Annotation of the design to describe specific features
- Measurements of all components
- Fabrics listed for garment, lining, interfacings,
- Notions listed to finish the garment
- Specific construction techniques listed for each component eg, seams, hems, edge finishes, closures,
- Embellishment techniques
- Changes made during the sampling and prototyping

**End of Section Two**

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