



ATAR course examination, 2020

Question/Answer booklet

MATERIALS DESIGN AND TECHNOLOGY

Sections One and Two

Please place your student identification label in this box

WA student number: In figures

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In words

Time allowed for this paper

Reading time before commencing work: ten minutes
Working time: two and a half hours

Time suggested 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: up to three calculators, which do not have the capacity to create or store programmes or text, are permitted in this ATAR course 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
Section One Short answer	3	3	20	41	15
Section Two Extended answer	4	4	40	36	25
Section Three Candidates to choose one of the following contexts: Wood Metal Textiles	6	6	90	72	60
Total					100

Instructions to candidates

- The rules for the conduct of the Western Australian external examinations are detailed in the *Year 12 Information Handbook 2020: Part II Examinations*. 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 answers to the specific questions asked and to follow any instructions that are specific to a particular question.
- Supplementary pages for planning/continuing your answers to questions are 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**15% (41 Marks)**

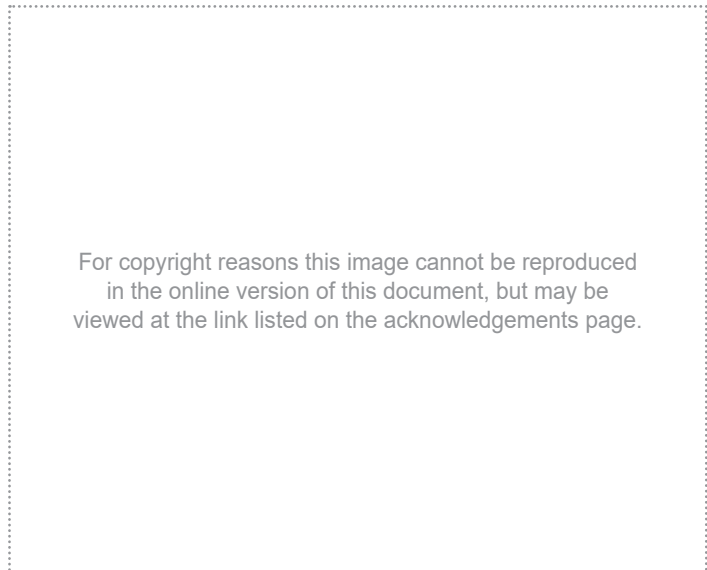
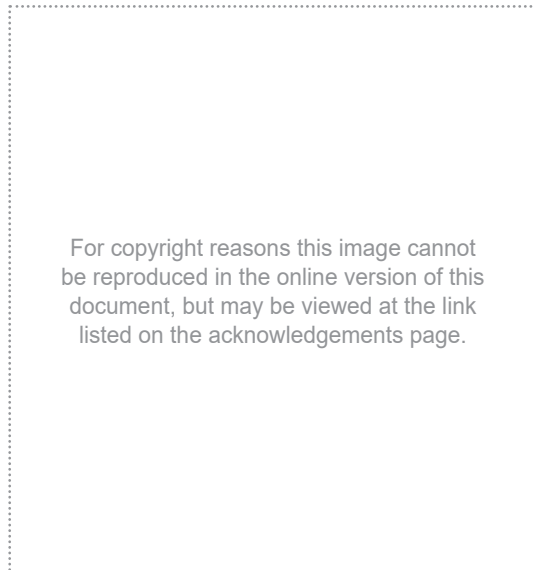
This section has **three** questions. Answer **all** questions. Write your answers in the spaces provided.

Supplementary pages for planning/continuing your answers to questions are 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.

Suggested working time: 20 minutes.

Question 1**(16 marks)**

The headphones below are used for listening to music when exercising. The target market is middle-aged adults.



- (a) State **four** design fundamentals that should be considered when evaluating the headphones. (4 marks)

One: _____

Two: _____

Three: _____

Four: _____

Question 1 (continued)

- (b) Evaluate the headphones against **three** of the design fundamentals identified in part (a).
(6 marks)

One: _____

Two: _____

Three: _____

- (c) Redesign the headphones for use by 4 to 8 year-old children, ensuring they are suitable for a range of play-related activities. Identify and describe **three** design factors you will need to consider. (6 marks)

One: _____

Two: _____

Three: _____

Question 2

(16 marks)

- (a) Identify **three** techniques you have used in your design portfolio to communicate and document your design ideas. Justify why you have used each technique. (6 marks)

Communication technique	Justification

- (b) Explain how design teams use technology to communicate their ideas to clients and manufacturers. (3 marks)

- (c) State **four** features of working drawings required for the manufacture of a product. (4 marks)

One: _____

Two: _____

Three: _____

Four: _____

- (d) Identify **three** potential consequences of an error in a working drawing during the manufacture of a product. (3 marks)

One: _____

Two: _____

Three: _____

Question 3

(9 marks)

A manufacturing company wants to commission the design of a storage device to hold a smart phone and tablet with chargers, cords and earphones.

In the box on page 9, produce a presentation drawing of your design idea.

(4 marks)

Annotate your design to indicate the main features including:

- materials
- finishes
- joining methods
- client/end user needs
- design features/decoration.

(5 marks)



Section Two: Extended answer

25% (36 Marks)

This section has **four** questions. Answer **all** questions. Write your answers in the spaces provided.

Supplementary pages for planning/continuing your answers to questions are 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.

Suggested working time: 40 minutes.

Question 4

(7 marks)

The chair below has been designed for use in an office or domestic environment.

Cushion and backrest upholstery – stain repellent polyester microfibre

Legs – powder coated tubular mild steel



Seat – lacquered plywood

Showtime chair – BD Barcelona Design

- (a) Justify the choice of **one** of the materials used in the production of the chair. (2 marks)

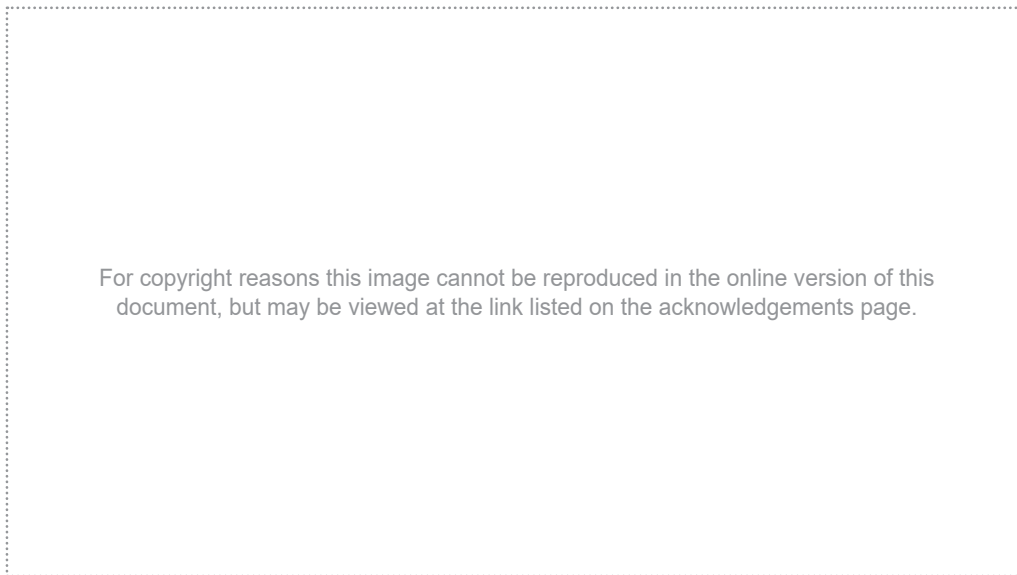
(b) Justify the choice of **one** of the finishes used in the production of the chair. (2 marks)

(c) Outline **three** ways in which the manufacturer can ensure that mass-produced parts are accurately made. (3 marks)

Question 5

(9 marks)

Designers create prototypes before manufacturing the product. Consider the image of the chair prototypes below.



- (a) At what stage of the design cycle is a prototype constructed? (1 mark)

- (b) Identify **four** tools a designer will use to evaluate a prototype against the design brief. (4 marks)

One: _____

Two: _____

Three: _____

Four: _____

- (c) Outline **four** advantages of using prototypes during the design process. (4 marks)

One: _____

Two: _____

Three: _____

Four: _____

ACKNOWLEDGEMENTS

- Question 1** First image from: Plantronics. (n.d.). [Backbeat fit 500 on-ear sport headphones, front view photograph]. Retrieved May, 2020, from <https://www.amazon.com.au/dp/B075ZC7FHT/?tag=headphonesadd-22>
- Second image adapted from: Plantronics. (n.d.). [Backbeat fit 500 on-ear sport headphones, headphones on case photograph]. Retrieved May, 2020, from <https://www.amazon.com.au/dp/B075ZC7FHT/?tag=headphonesadd-22>
- Question 4** Image from: Hayon, J. (n.d.). *Showtime chair - Sled base 1/10*. Retrieved May, 2020, from <https://bdbarcelona.com/en/product/46>
- Question 5** Image from: Form Us With Love. (2018). *New school* [Photograph of 5 stages of concept chair against grey background]. Retrieved May, 2020, from <https://mdd.eu/en/sillera/new-school/>
- Question 6** Image A from: Eames Office. (n.d.). *Hang it all* [Photograph of coat rack]. Retrieved May, 2020, from <https://viagaribaldi12.com/vetrina.vg12/a12456/en>
- Image B: [Black rack with 4 hooks]. (n.d.).
- Question 7** First sentence from: Sustainable products. (2020). In *Wikipedia*. Retrieved May, 2020, from https://en.wikipedia.org/wiki/Sustainable_products
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