



# Western Australian Certificate of Education Examination, 2014

## Question/Answer Booklet

### MATERIALS DESIGN AND TECHNOLOGY

#### Stage 3

#### Sections One and Two

Please place your student identification label in this box

Student Number: In figures

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In words

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#### Time allowed for this paper

Reading time before commencing work: ten minutes  
Working time for paper: two and a half 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  
Section Three 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 the WACE examinations

#### 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 notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

## Structure of the examination

The WACE Materials Design and Technology Stage 3 examination consists of a written component worth 50 per cent of the total examination score and a practical (portfolio) component worth 50 per cent of the total examination score.

## Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of total exam
Section One: Short answer	3	3	20	22	7.5
Section Two: Extended answer	4	4	40	42	12.5
Section Three: Candidates to choose <b>one</b> of the following contexts:					
Wood	5	5	90	54	30
Metal	5	5	90	54	
Textiles	5	5	90	54	
				<b>Total</b>	50

## Instructions to candidates

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2014*. Sitting this examination implies that you agree to abide by these rules.
2. Answer the questions according to the following instructions.  
  
Sections One and Two: Answer **all** questions. Write your answers in this Question/Answer Booklet.
3. 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.
4. 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 an 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 the question that you are continuing to answer at the top of the page.

**Section One: Short answer****7.5% (22 Marks)**

This section has **three (3)** 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 an 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 the question that you are continuing to answer at the top of the page.

Suggested working time: 20 minutes.

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**Question 1****(8 marks)**

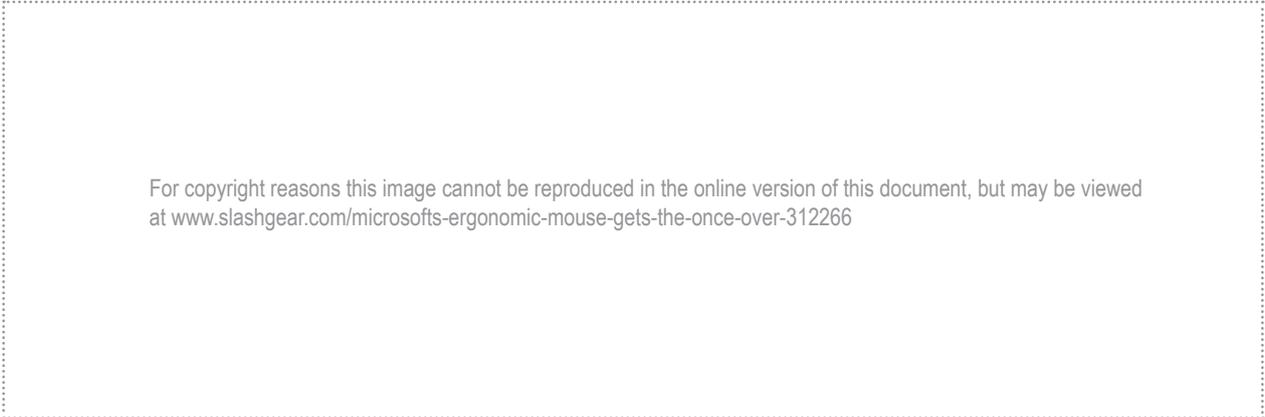
Identify **two** fasteners/joins you might use in the construction of a product. List **one** specialised piece of equipment or machinery needed to apply each fastener/join. Identify **one** advantage and **one** disadvantage of using each fastener/join.

Fastener/ Join	Specialised equipment or machinery required	Advantage	Disadvantage

**Question 2**

**(4 marks)**

Make reference to **four** features to explain how ergonomics has been considered during the development of the product shown in Figure 1.



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## Question 3

(10 marks)

Working drawings are an integral part of the production planning process.

- (a) List **three** essential features of working drawings of a product intended for manufacture. (3 marks)

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- (b) Describe **three** consequences of an error in a working drawing. (3 marks)

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- (c) A journal is traditionally completed during production of a prototype. Outline **two** important features this journal should contain and explain what might occur when this product is mass-produced if these features are not included in the journal. (4 marks)

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End of Section One

See next page

Section Two: Extended answer

12.5% (42 Marks)

This section contains **four (4)** 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 an answer.

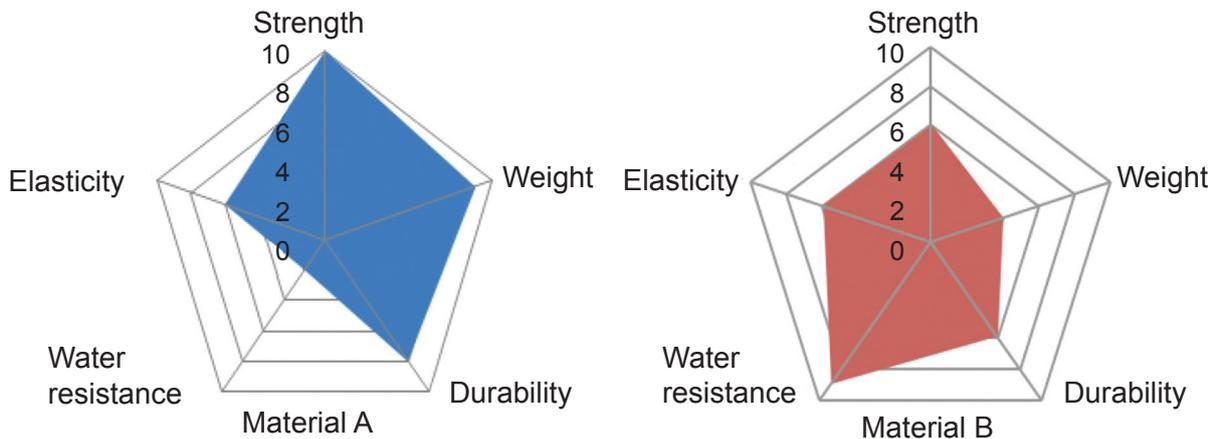
- Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
- Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question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

Suggested working time: 40 minutes.

Question 4

(12 marks)

The properties of **two** materials, 'A' and 'B', are represented in the following radar charts.



(a) From the list below, select **one** product and provide an explanation that supports either Material A **or** B as the most suitable for its construction. (4 marks)

- bicycle frame
- skateboard deck
- shade sail

Product: \_\_\_\_\_

Suitability: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- (b) Identify **one** material/composite/fibre that could be represented by **one** of the charts in part (a), on the basis of its properties, and justify your answer. (2 marks)

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- (c) Identify and describe **two** tests that are used to assess the physical properties of a material in your context. (4 marks)

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- (d) Give **two** reasons why the standardised testing of materials is important in the manufacturing industry. (2 marks)

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- (b) Explain how the designer of the playground equipment has considered the following design fundamentals: (3 marks)
- aesthetics
  - function
  - anthropometric data.

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- (c) Describe **two** ways in which a designer can best predict trends in order to remain competitive. (2 marks)

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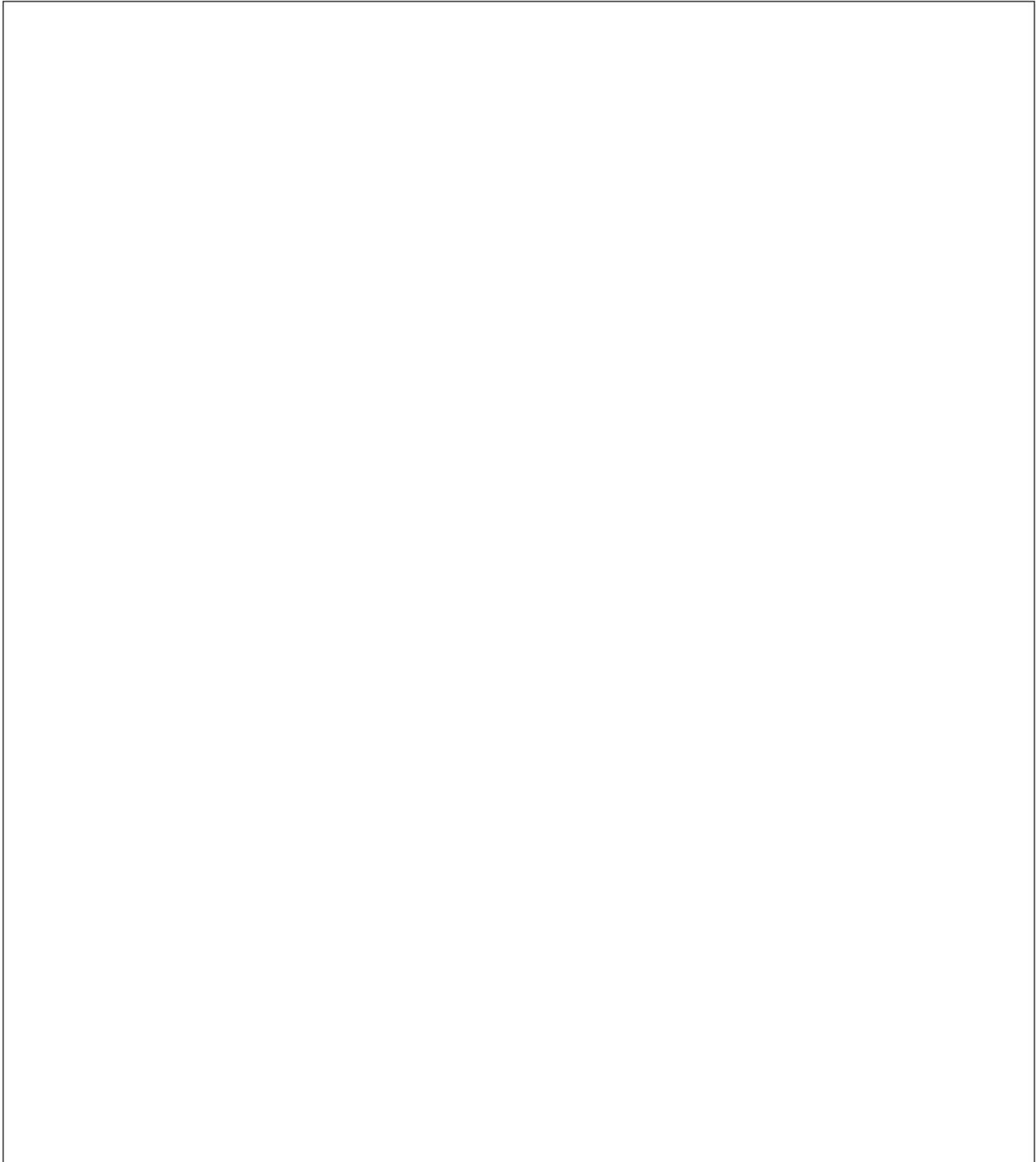
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## Question 7

(8 marks)

In the space provided below, draw a product that you might create in your context. This product **must** contain an identifiable historical **or** cultural feature. Identify the technique used to incorporate this feature. On the drawing, point out the aesthetic and functional features of the product.



Technique: \_\_\_\_\_

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**End of Section Two**









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