



Western Australian Certificate of Education Examination, 2015

Question/Answer Booklet

MATERIALS DESIGN AND TECHNOLOGY

Stage 3

Section Three

Please place your student identification label in this box

Student Number: In figures

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In words

Time recommended for this section

Suggested working time for this section: ninety minutes

Materials required for this section

To be provided by the supervisor

This Question/Answer Booklet

Sections One and Two 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 the WACE examinations

Place a tick (✓) in one of the following boxes to indicate your specialised context

Wood

Metal

Textiles

Number of additional answer booklets used (if applicable):

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	24	15
Section Two: Extended answer	3	3	40	22	25
Section Three: Candidates to choose one of the following contexts:					
Wood	5	5	90	67	60
Metal	5	5	90	67	
Textiles	5	5	90	67	
				Total	100

Instructions to candidates

1. The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2015*. Sitting this examination implies that you agree to abide by these rules.
2. Answer the questions according to the following instructions.

Section Three: Answer **all** of the questions within your specialised field: Wood, Metal or Textiles. 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 Three: Sectionalised and extended answer**60% (67 Marks)**

You are required to choose **one (1)** of the following options, according to the context you have studied in 2015.

Tick one of the boxes below to indicate your choice of context.

Context	✓	Question	Pages
Wood	<input type="checkbox"/>	7–11	4–14
Metal	<input type="checkbox"/>	12–16	15–25
Textiles	<input type="checkbox"/>	17–21	26–37

Now turn to the relevant pages and answer the questions for the context you have selected.

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.

Section Three: Wood context

60% (67 Marks)

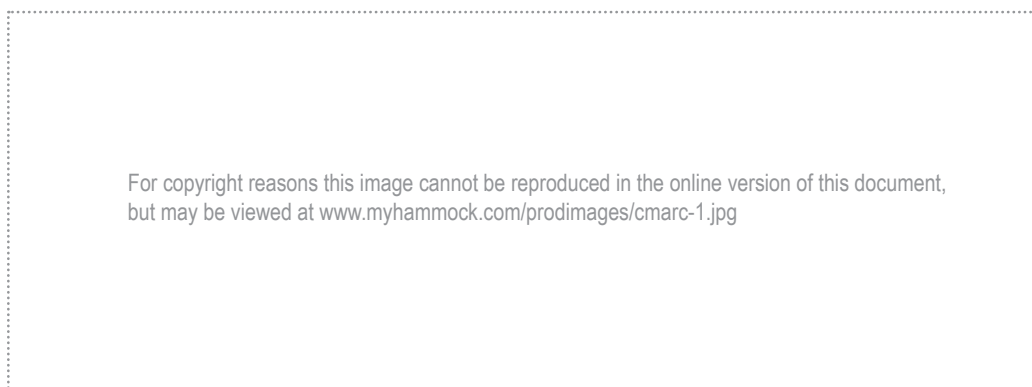
This section contains **five (5)** questions. Answer **all** questions.

Suggested working time: 90 minutes.

Question 7

(12 marks)

Below is a picture of a hammock that has been designed for adults. The hammock has a timber frame and a textile sling.



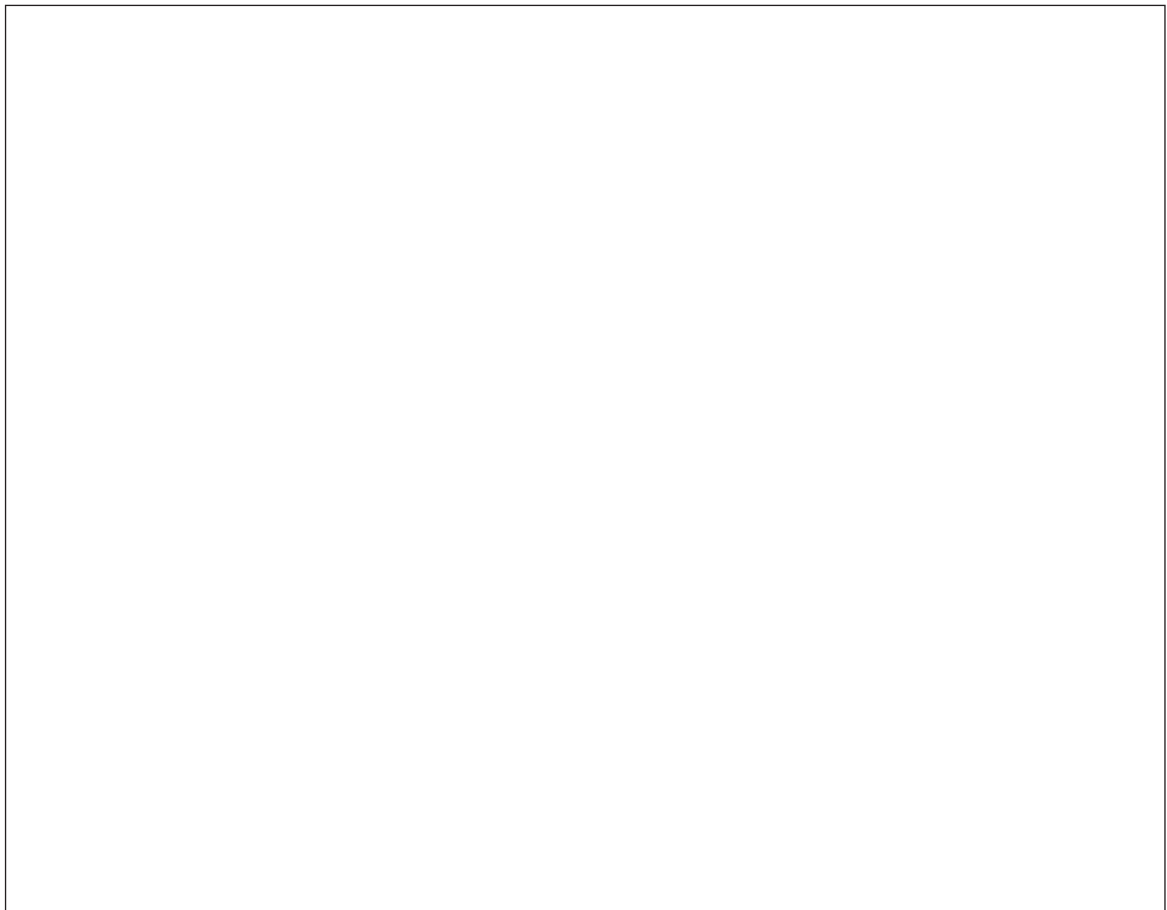
- (a) With reference to its properties, identify a suitable timber for the hammock frame.

(3 marks)

- (b) Before the final material was selected for the frame, it had to be tested to check its physical and mechanical properties.

Describe in detail a suitable testing method you could use in a school workshop that could help the designer to choose the most suitable material. Use a sketch to help explain your answer. (6 marks)

Space for sketching



Question 7 (continued)

- (c) Identify a suitable finish that could be applied to the frame and explain **two** properties of the finish that will protect the material from the outdoor environment. (3 marks)

Question 8 (continued)

(b) Define what a trend is and explain how it can impact a target audience. (3 marks)

(c) Outline **three** techniques that could be used to carry out market research. (3 marks)

- (d) Study the information provided in the design brief and design restrictions stated in Question 8 and use this information to produce **two** designs that you can present to your client. Use annotations to justify and explain the suitability of your concepts. (12 marks)

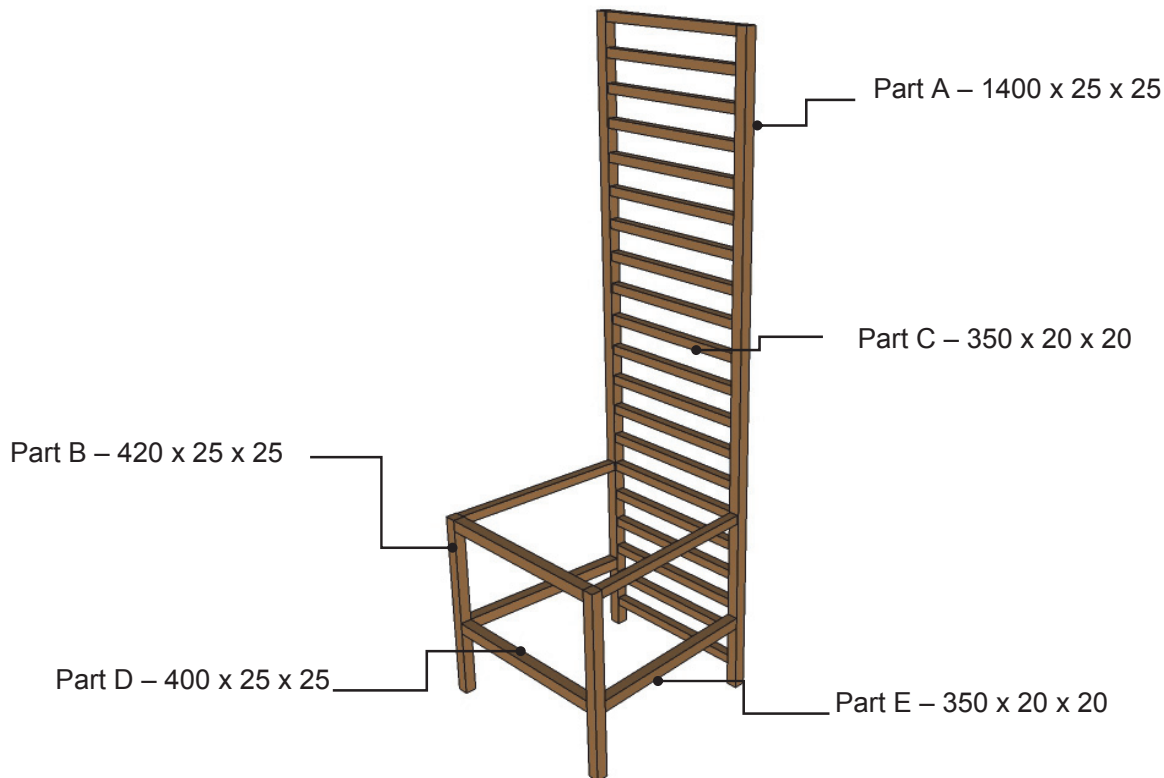
Design 1

Design 2

Question 9

(10 marks)

Using the drawing and price list below, calculate the material requirements and the cost of each component part for making a single chair frame. Complete the table and round your costs to the nearest cent. All sizes are in millimetres.



PINE	
mm	\$/m
20 x 6	3.92
40 x 6	6.20
60 x 6	7.92
70 x 6	9.23
90 x 6	10.54
125 x 6	23.91

PINE	
mm	\$/m
20 x 20	5.21
40 x 20	7.86
60 x 20	7.92
70 x 20	12.35
90 x 20	16.74
175 x 20	23.91

PINE	
mm	\$/m
25 x 25	10.68
40 x 40	16.32
60 x 40	21.21
80 x 40	31.75
125 x 40	44.69
60 x 60	39.90

Part	Material	Size	Number required	Total length (M)	Cost: (\$/m)	Cost: sub-total

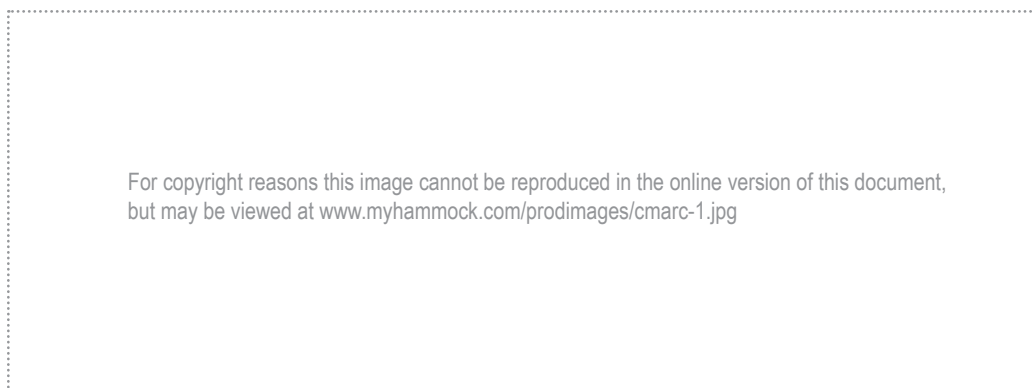
Section Three: Metal context**60% (67 Marks)**

This section contains **five (5)** questions. Answer **all** questions.

Suggested working time: 90 minutes.

Question 12**(12 marks)**

Below is a picture of a hammock that has been designed for adults. The hammock has a metal frame and a textile sling.



- (a) With reference to its properties, identify a suitable metal for the hammock frame. (3 marks)

- (c) Identify a suitable finish that could be applied to the frame and explain **two** properties of the finish that will protect the material from the outdoor environment. (3 marks)

(b) Define what a trend is and explain how it can impact a target audience. (3 marks)

(c) Outline **three** techniques that could be used to carry out market research. (3 marks)

Question 13 (continued)

- (d) Study the information provided in the design brief and design restrictions stated in Question 13 and use this information to produce **two** designs that you can present to your client. Use annotations to justify and explain the suitability of your concepts.

(12 marks)

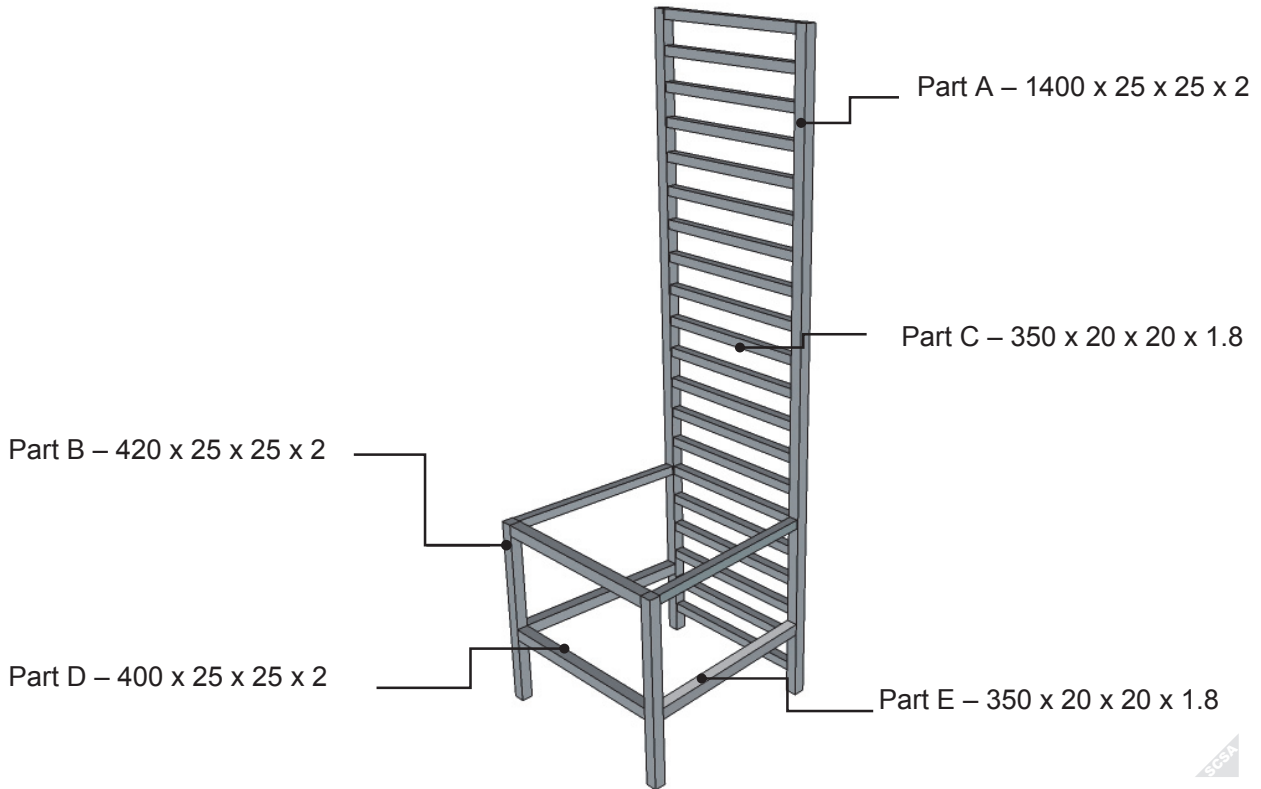
Design 1

Design 2

Question 14

(10 marks)

Using the drawing and price list below, calculate the material requirements and the cost of each component part for making a single chair frame. Complete the table and round your costs to the nearest cent. All sizes are in millimetres.



Square Hollow Section	
13 x 13 x 1.8	\$8.76
15 x 15 x 1.8	\$9.49
20 x 20 x 1.6	\$7.78
20 x 20 x 1.8	\$8.68
25 x 25 x 1.6	\$9.59
25 x 25 x 2.0	\$12.25
30 x 30 x 1.6	\$14.78
30 x 30 x 2.0	\$17.69
40 x 40 x 1.6	\$20.45
50 x 50 x 2.0	\$29.85

E.R.W. Tubing Round	
12.7 x 1.2	\$3.23
16.0 x 1.2	\$2.97
16.0 x 1.6	\$3.49
19 x 1.2	\$3.23
19 x 1.4	\$3.38
22.2 x 1.2	\$3.82
22.2 x 1.6	\$4.90
25 x 1.2	\$4.49
25 x 1.6	\$4.85
28.6 x 1.6	\$3.94

Part	Material	Size	Number required	Total length (M)	Cost: (\$/m)	Cost: sub-total

Section Three: Textiles context

60% (67 Marks)

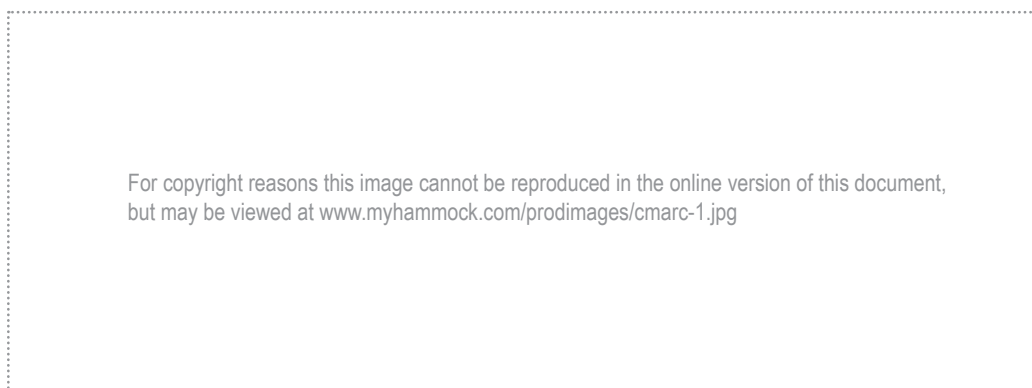
This section contains **five (5)** questions. Answer **all** questions.

Suggested working time: 90 minutes.

Question 17

(12 marks)

Below is a picture of a hammock that has been designed for adults. The hammock has a timber frame and a textile sling.



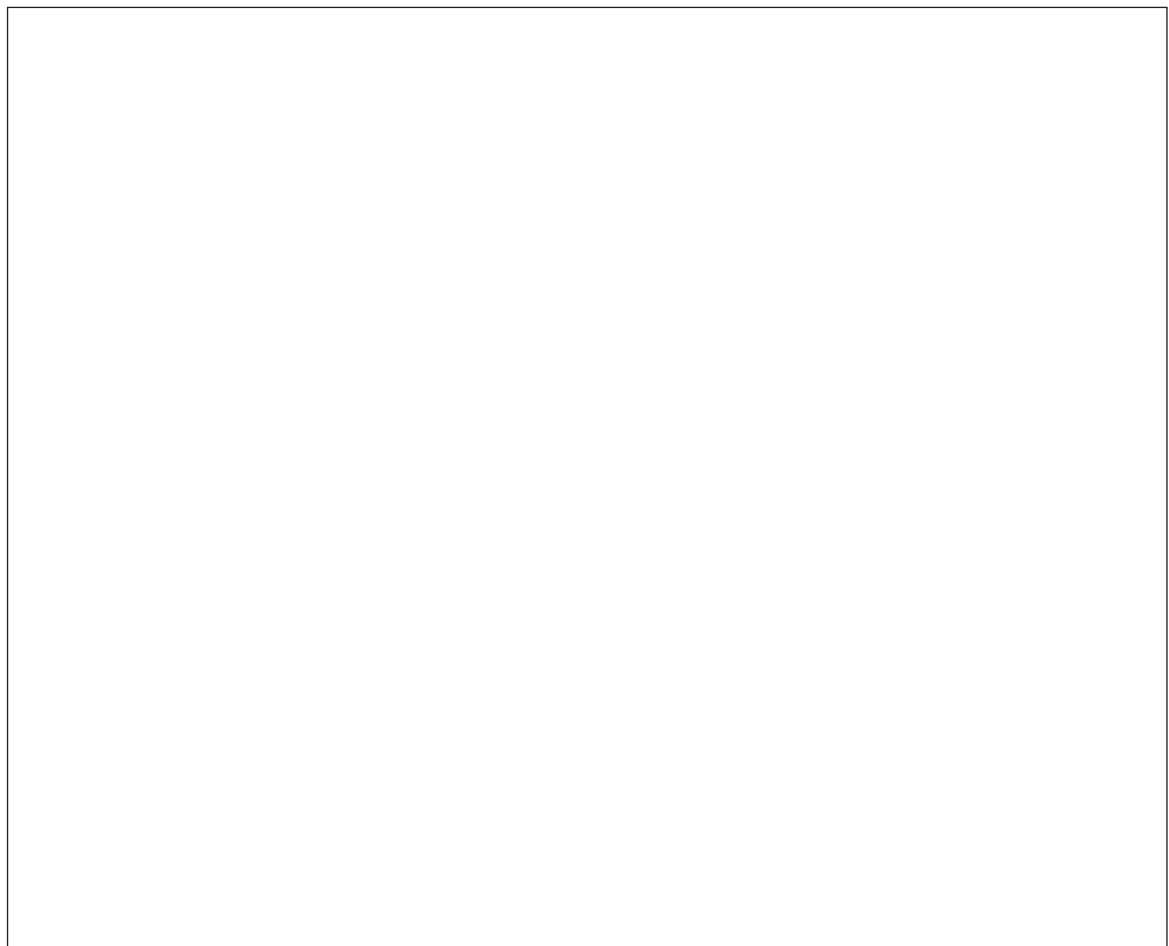
- (a) With reference to its properties, identify a suitable textile for the hammock sling.

(3 marks)

- (b) Before the final material was selected for the sling, it had to be tested to check its physical and mechanical properties.

Describe in detail a suitable testing method you could use in a school workshop that could help the designer to choose the most suitable material. Use a sketch to help explain your answer. (6 marks)

Space for sketching



Question 17 (continued)

- (c) Identify a suitable finish that could be applied to the textile and explain **two** properties of the finish that will protect the material from the outdoor environment. (3 marks)

Question 18 (continued)

- (b) Define what a trend is and explain how it can impact a target audience. (3 marks)

- (c) Outline **three** techniques that could be used to carry out market research. (3 marks)

- (d) Study the information provided in the design brief and design restrictions and use this information to produce **two** designs that you can present to your client. Use annotations to justify and explain the suitability of your concepts. (12 marks)

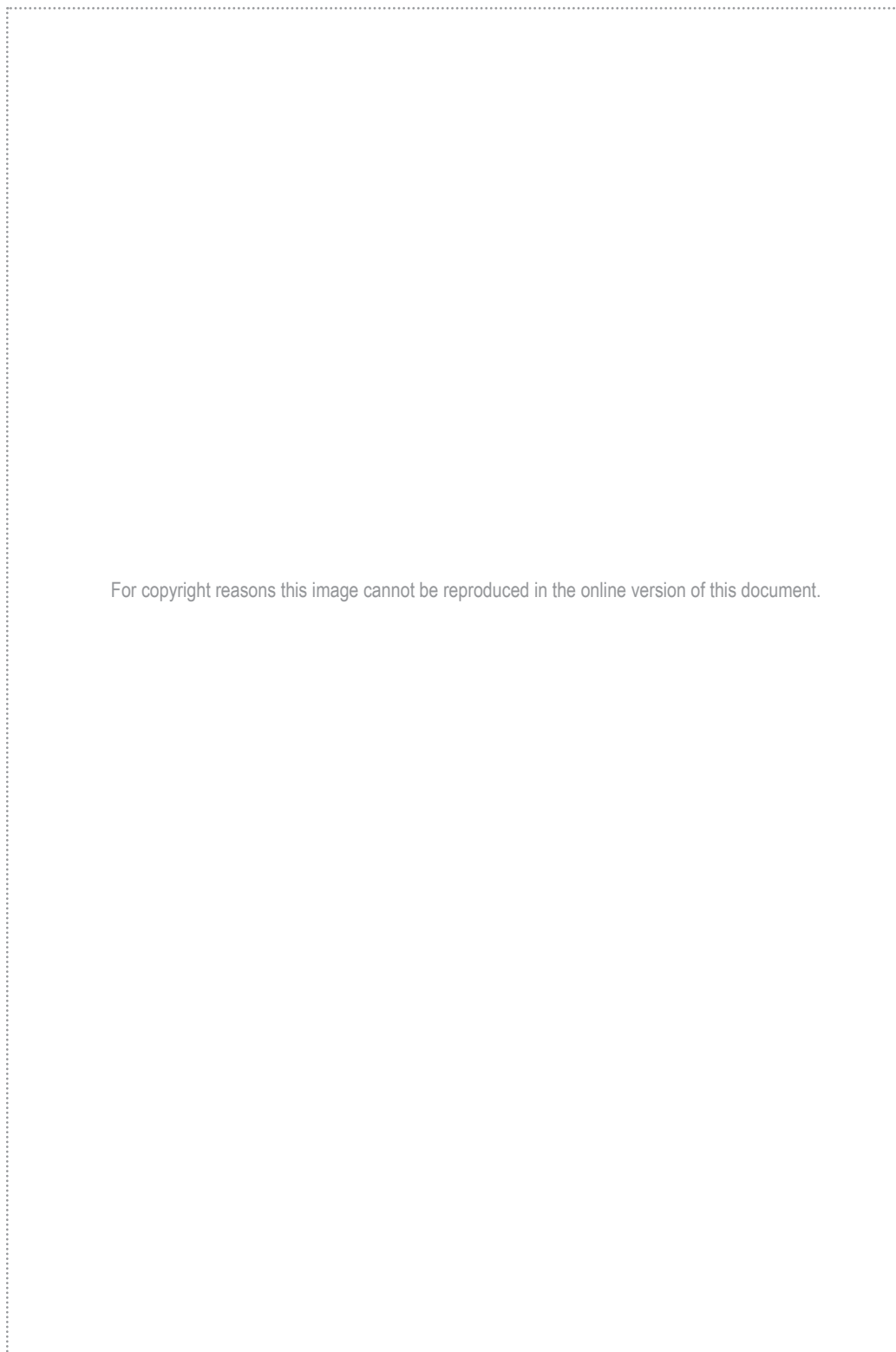
Design 1

Design 2

Question 19

(10 marks)

Using the drawing, the data table and the price list below, calculate the material requirements and the cost of making a size 12 garment in View A from 150 cm wide polyester delustrated satin, fully lined with a nylon net petticoat. Complete the table and round your costs to the nearest cent.



Size 12 View A costing			
Materials	Quantity	Cost per unit	Cost per garment
Polyester delustred satin			
Lining			
Fusible interfacing			
Nylon net petticoat			
30 cm Open-ended bodice zip	1		
20 cm Skirt zip	1		

ACKNOWLEDGEMENTS

Section One

Question 1

Image 1

Safety sign 1 [Image]. (n.d.). Retrieved January 21, 2015, from <http://images.labelbar.co.uk/images/products/zoom/1359544428-73168100.gif>

Image 2

Konieczny, R. (2007, February 24). *Safety sign 2* [Image]. Retrieved January 21, 2015, from http://commons.wikimedia.org/wiki/File:Sign_eyewash.svg

Image 3

NewForestFootwear. (n.d.). *Safety sign 3* [Image]. Retrieved January 21, 2015, from www.newforestfootwear.com/resources/wp-content/uploads/2011/03/p1-6.jpg

Question 2

Figure 1

Mobile phone [Image]. (n.d.). Retrieved January 21, 2015, from http://cdn0.mos.techradar.futurecdn.net/art/mobile_phones/Huawei/AscendMate/Review/huawei-mate5-420-90.jpg

Section Two

Question 4

Image 1

Portable speaker (orange) [adapted image]. (n.d.). Retrieved January 21, 2015, from www.amazon.com/ECOXGEAR-Waterproof-Wireless-Bluetooth-Speaker/dp/B005D91G38/ref=pd_sim_e_3?ie=UTF8&refRID=1DX7AZJVAX5AF1X8FFGZ

Image 2

Portable speaker [adapted image]. (n.d.). Retrieved January 21, 2015, from http://ecx.images-amazon.com/images/I/51aKQQHEuwl._SX425_.jpg

Question 5

Image 1

Old computer [image]. (2014). Retrieved January 21, 2015, from <http://oldcomputers.net/appleii.html>

Image 2

Modern computer [image]. (2012). Retrieved January 21, 2015, from www.nfcworld.com/wp-content/uploads/2012/09/hp-envy-x2-nfc-460.jpg

Section Three

Question 7

Hammock [adapted image]. (n.d.). Retrieved January 21, 2015, from www.myhammock.com/prodimages/cmarc-1.jpg

Question 12

Hammock [adapted image]. (n.d.). Retrieved January 21, 2015, from www.myhammock.com/prodimages/cmarc-1.jpg

Question 17 *Hammock* [adapted image]. (n.d.). Retrieved January 21, 2015, from www.myhammock.com/prodimages/cmarc-1.jpg

Question 19 Adapted from: Simplicity Creative Group. (n.d.). *Simplicity dress pattern* [Image].

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