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| Centre Number       |  |  |  |  |  | Candidate Number |  |  |  |  |
| Surname             |  |  |  |  |  |                  |  |  |  |  |
| Other Names         |  |  |  |  |  |                  |  |  |  |  |
| Candidate Signature |  |  |  |  |  |                  |  |  |  |  |

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| For Examiner's Use  |      |
| Examiner's Initials |      |
| Question            | Mark |
| 1                   |      |
| 2                   |      |
| 3                   |      |
| 4                   |      |
| 5                   |      |
| 6                   |      |
| 7                   |      |
| 8                   |      |
| TOTAL               |      |



General Certificate of Education  
Advanced Subsidiary Examination  
June 2014

# Design and Technology: Product Design (3-D Design)

## PROD1

### Unit 1 Materials, Components and Application

Wednesday 14 May 2014 9.00 am to 11.00 am

**For this paper you must have:**

- Normal writing and drawing instruments

**Time allowed**

- 2 hours

**Instructions**

- Use black ink or black ball-point pen.
- Use pencil only for drawing.
- Fill in the boxes at the top of the page.
- Answer **all** questions in Section A.
- Answer **one** question from Section B, **either** Question 6 or Question 7.
- Answer Question 8 in Section C.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.

**Information**

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- There are 20 marks for Section A, 20 marks for Section B and 40 marks for Section C.
- You will be marked on your ability to:
  - use good English
  - organise information clearly
  - use specialist vocabulary where appropriate.

**Advice**

- Illustrate your answers with sketches and/or diagrams where appropriate.
- You are advised to spend approximately 30 minutes on Section A, 30 minutes on Section B and one hour on Section C.



J U N 1 4 P R O D 1 0 1

M/SEM/103772/Jun14/E2

## PROD1

**Section A**

Answer **all** of the questions in this section.

**1** Carton board is a *compliant material*.

Name a product it is used in **and** give **two** reasons why carton board is suitable for the product you have named.

**[3 marks]**

Product .....

Reason 1 .....

.....

.....

Reason 2 .....

.....

.....

3

**2** Match each process description shown below to the correct workshop manufacture technique.

**[3 marks]**

**A** Wasting

**B** Addition

**C** Redistribution

You should use each letter once only.

**Manufacture technique**

**Process description**

MIG welding

Drilling a hole

Sand casting

3



3 (a) Name a product that might have the symbol shown below on it.



[1 mark]

Product .....

3 (b) Explain the meaning of the symbol in part (a) **and** why it is used on the product you have named.

[2 marks]

Meaning .....

.....

Why it is used .....

.....

.....

3

4 (a) What is meant by the term *composite material*?

[2 marks]

.....

.....

.....

4 (b) Name a specific composite material **and** give an application for this material.

[2 marks]

Composite Material .....

Application .....

.....

Turn over ▶

4



**5 (a)** Which classification of timbers do Ash and Oak belong to?

**[1 mark]**

.....

**5 (b)** Give an application for **one** of the timbers named in part (a).

**[2 marks]**

Timber.....

Application .....

**5 (c)** Give **two** reasons to explain why this timber is suitable for the application you have named in part (b).

**[2 × 2 marks]**

Reason 1 .....

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Reason 2 .....

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**Turn over for the next question**

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**Turn over ▶**



0 5

**Section B**Answer **either** Question 6 **or** Question 7.

- 6 (a)** For each of the following materials, explain in detail why it is suitable for the product. In your answer you may wish to consider manufacture, function and aesthetics.

|      | <b>Material</b> | <b>Product</b>      |
|------|-----------------|---------------------|
| (i)  | Foam board      | Architectural model |
| (ii) | Aluminium       | Drinks can          |





6 (a) (ii) Aluminium (drinks can)

[8 marks]

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**6 (b) (i)** Name a different product made from aluminium.

**[1 mark]**

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**6 (b) (ii)** Name a suitable manufacturing process for the product you named in part (b)(i).

**[1 mark]**

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**6 (b) (iii)** Explain why the manufacturing process you named in part (b)(ii) is suitable for the product.

**[2 marks]**

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| 20 |

**Turn over for the next question**

**Turn over ▶**



**Do not answer this question if you have answered Question 6.**

**7** The photographs show a dining chair.

Answer the following questions.



**7 (a) (i)** Name a specific timber material suitable for the seat of the chair.

**[1 mark]**

.....

**7 (a) (ii)** Explain in detail why the material you named in part (a)(i) is suitable for the seat of the chair.

**[4 marks]**

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**Question 7 continues on the next page**

**Turn over ▶**



7 (a) (iii) Use notes and diagrams to describe the most appropriate method for manufacturing the **whole** dining chair (seat and legs).

**[10 marks]**

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Question 7 continues on the next page

Turn over ▶



**7 (b)** Describe in detail an appropriate method of finishing the **seat** of the chair.  
In your answer you should refer to a specific finish **and** explain why it is suitable.

**[5 marks]**

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| <b>20</b> |



### Section C

You **must** answer this question.

**8** The photographs show a toy for children aged 4 years and older.



**8 (a) (i)** Name a specific polymer suitable for the outer casing of the toy. **[1 mark]**

.....

**8 (a) (ii)** Explain in detail why the polymer you named in part (a)(i) is suitable. **[6 marks]**

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**Turn over ▶**



**8 (a) (iii)** The outer casing of the toy has been injection moulded.

Use notes and diagrams to describe this process.

**[8 marks]**

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Question 8 continues on the next page

Turn over ▶



**8 (a) (iv)** The manufacturer wants the toy to be as environmentally friendly as possible.  
Describe how the manufacturer can make the toy environmentally friendly.

**[4 marks]**

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**8 (b)** The aesthetic and functional features of the toy could be enhanced by using smart materials. Explain how.

You may use diagrams to support your answer.

**[6 marks]**

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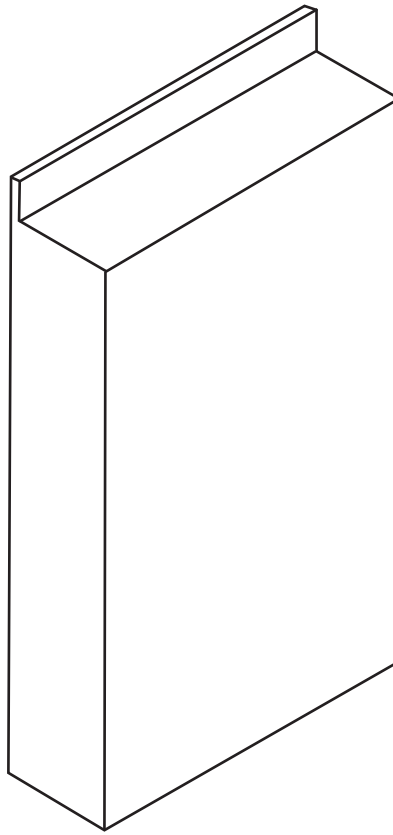
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**Question 8 continues on the next page**

**Turn over ▶**



**8 (c)** The drawing below shows a basic point of sale packaging for the toy.



Keeping the overall packaging shape the same, develop the package to:

- attract the target market of children aged between 4 and 6 years old
- provide suitable retail packaging.

In your answer you should use notes and diagrams and make reference to:

- function
- aesthetics
- materials
- manufacture
- sustainability.

**[15 marks]**



**Turn over for additional space for question 8(c) if required**



**END OF QUESTIONS**

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|-----------|
|           |
| <b>40</b> |



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