

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

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



General Certificate of Education
Advanced Subsidiary Examination
January 2012

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

PROD1

Unit 1 Materials, Components and Application

Tuesday 17 January 2012 9.00 am to 11.00 am

For this paper you must have:

- normal writing and drawing instruments
- a colour Insert Sheet (enclosed).

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 this page.
- Answer **six** questions.
- Answer **all** questions in Section A.
- Answer **one** question from Section B, **either** Question 5 **or** Question 6.
- Answer Question 7 in Section C.
- You must answer the questions in the spaces provided. Do not write outside the box around each page.
- 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 A N 1 2 P R O D 1 0 1

M/Jan12/PROD1

PROD1

Section A

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

1 (a) Define what is meant by the term *thermoset polymer*.

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(2 marks)

1 (b) Urea Formaldehyde is a thermoset polymer.

Name a product in which it is used and explain why this material is suitable for the product you have named.

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(3 marks)

5



2 Flexible Medium Density Fibreboard is a modern material.

Name a product in which it is used and explain why this material is suitable for the product you have named.

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(3 marks)

3

3 Match each of the components listed below with the correct joining method for the applications given.

- A** Cam-lock fitting
- B** Panel Pin
- C** Self-tapping screw
- D** Polymer corner blocks

In each case, put the correct letter in the box on the right.
You should use each component once only.

Joining Method

Component

Fitting a hard board sheet to the back of flat-pack bookcase

Securing the top and bottom pieces to the side panels of a flat-pack bookcase

Fitting a decorative trim to the base of a flat-pack bookcase

Fitting a polymer handle to a drawer front

(4 marks)

4

Turn over ▶



Section B

Answer **either** Question 5 **or** Question 6.

5 Study the photographs of the aluminium garden chair (**Figures 1 and 2**) on the Insert Sheet and answer the following questions.

5 (a) Explain in detail why aluminium is a suitable material for a garden chair.

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(6 marks)

Question 5 continues on the next page

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5 (b) The garden chair has been made by forming and fabrication processes. Use notes and diagrams to describe the most appropriate methods of batch producing chairs like the one shown in **Figures 1** and **2**.

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Question 5 continues on the next page

(10 marks)

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

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(4 marks)

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Turn over for the next question



Turn over for the next question

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ANSWER IN THE SPACES PROVIDED**

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Do not answer this question if you have answered Question 5.

6 (a) For each of the following materials, explain in detail why it is suitable for the product listed.

Your answer should make reference to:

- product function
- product aesthetics
- product manufacture.

Material	Product
(i) Polyethylene Terephthalate (PET)	Mineral water bottle
(ii) Veneered Medium Density Fibreboard	Dining Table
(iii) Recycled unbleached card	Liner for mobile phone packaging



6 (b) Recycled unbleached card is one material suitable for the liner of mobile phone packaging. Name an alternative material that could be used and give **one** reason why this material would be suitable.

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(2 marks)

20



7 (a) (ii) The chair has been rotationally moulded. Use notes and diagrams to describe this process.

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(10 marks)

Question 7 continues on the next page

Turn over ▶



7 (b) (i) Use notes and diagrams to critically evaluate the anthropometric, ergonomic and safety aspects of the chair. You should refer to the data table on the Insert Sheet.

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Question 7 continues on the next page

(9 marks)

Turn over ▶



7 (b) (ii) Use notes and diagrams to develop the design of the child's chair. In your answer, you should consider the following specification:

- provide a means of storing toys or other items
- include additional play or learning features.



(10 marks)

Question 7 continues on the next page

Turn over ▶



7 (b) (iii) Given the developments that you have suggested in part (ii), briefly describe what changes would need to be made in the manufacturing process of the chair.

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(5 marks)

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END OF QUESTIONS



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