### General Certificate of Secondary Education

### June 2015

#### Design and Technology: Graphic Products

##### Unit 1 Written Paper

**Wednesday 17 June 2015 1.30 pm to 3.30 pm**

**For this paper you must have:**

- a black pen, a pencil, a ruler, an eraser, a pencil sharpener and coloured pencils.

**Time allowed**

- 2 hours

**Instructions**

- Use black ink or black ball-point pen. Use pencil and coloured pencils only for drawing.
- Fill in the boxes at the top of this page.
- Answer all questions.
- 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 answer book. Cross through any work you do not want to be marked.

**Information**

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 120.
- Section A relates to the context given in the Preliminary Material that was previously issued.
- You are reminded of the need for good English and clear presentation in your answers. Quality of Written Communication will be assessed in Question 4.
There are no questions printed on this page
Section A

Answer this question in the spaces provided.

Section A is about designing.

You are advised to spend 33 minutes on this question.

Design Theme: Prototype block modelling of children's hand held products based on the theme of wildlife.

Look at the Design Brief and Design Criteria below.

Design Brief

A company wants to introduce a new toothbrush for children.

Design Criteria

You have been asked to design the handle for the toothbrush.

The toothbrush handle must:

- be based on the theme of wildlife
- appeal to children up to the age of 10 years
- be suitable for small hands to grip.

Question 1 continues on the next page
1 (a) Use the design criteria below to produce a series of annotated sketches which show the initial ideas and development of your designs for the toothbrush handle.

**Design Criteria**

The toothbrush handle must:

- be based on the theme of wildlife
- appeal to children up to the age of 10 years
- be suitable for small hands to grip.

Marks will be awarded for:

- effective use of the design criteria [4 marks]
- creativity and quality of the development, including an indication of colour [10 marks]
- notes explaining your sketches [3 marks]
1 (b) In the space below, produce a coloured three-dimensional (3D) drawing of your final handle. [10 marks]
1 (c) Evaluate the final toothbrush handle you have drawn in part (b) against one of the design criteria given on page 4.

[3 marks]

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1 (d) (i) Name a suitable block modelling material for a prototype of your toothbrush handle.

[1 mark]

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1 (d) (ii) Explain why the material you have chosen in part (d)(i) is suitable.

[2 marks]

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Turn over for the next question
Section B

Answer all questions in the spaces provided.

This question is about representing data.

You are advised to spend about 16 minutes on this question.

2 (a) Draw a line to match each method of representing data with its graphical form.

[4 marks]

Graphical Form

<table>
<thead>
<tr>
<th>Method</th>
<th>Graphical Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Graph</td>
<td>Popularity of Different Sports in School</td>
</tr>
<tr>
<td></td>
<td>Reports: totals by month</td>
</tr>
<tr>
<td></td>
<td>Varieties of apples in a food store</td>
</tr>
<tr>
<td></td>
<td>Results of Maths Test</td>
</tr>
<tr>
<td></td>
<td>Daily high temperatures for one week</td>
</tr>
</tbody>
</table>

Turn over
2 (b) Describe one advantage of using a bar chart to represent data. [2 marks]

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2 (c) The results of a questionnaire to find out which fruit is most popular in a school canteen are shown in Figure 1 below.

Complete the pictograph in Figure 2 using the data in the table below.

Each symbol in the pictograph represents 10% of the result.

Marks will be awarded for:

- accuracy of data [4 marks]
- use of symbols [3 marks]
- labelling the graph. [3 marks]

Figure 1

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Key</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td><img src="image" alt="Apple" /></td>
<td>20%</td>
</tr>
<tr>
<td>Banana</td>
<td><img src="image" alt="Banana" /></td>
<td>10%</td>
</tr>
<tr>
<td>Strawberry</td>
<td><img src="image" alt="Strawberry" /></td>
<td>30%</td>
</tr>
<tr>
<td>Pear</td>
<td><img src="image" alt="Pear" /></td>
<td>40%</td>
</tr>
</tbody>
</table>
Figure 2

Title: 

0% 

Apple  Banana  Strawberry  Pear 

Do not colour the fruit symbols

Turn over for the next question
This question is about three-dimensional (3D) sketching.

You are advised to spend about 18 minutes on this question.

3 The orthographic drawing shown in Figure 3 is of a milk carton.

Figure 3

Dimensions are given in millimetres (mm)
3 (a) Using the information in Figure 3, complete a full-size one point perspective drawing of the milk carton. The front corner of the carton has been drawn for you at point A in Figure 4.

[12 marks]

Figure 4

3 (b) Complete the word ‘MILK’ on the carton panel. The stem on the left hand side of the letter ‘M’ has been completed for you. Estimate any sizes not given.

[6 marks]
This question is about sustainability and recycling. You are advised to spend about 8 minutes on this question.

4 Discuss the advantages and disadvantages of recycling packaging materials.

You should use examples to support your answer.

You will be assessed on Quality of Written Communication in this question. [8 marks]

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This question is about the scale of production.

You are advised to spend about 6 minutes on this question.

Below is a list of different types of production methods.

Complete the table below.

An example has been completed for you.

<table>
<thead>
<tr>
<th>Scale of production and example</th>
<th>Describe the production method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One-off production</strong></td>
<td>One-off production is when only one of the product is made. It is usually a unique or specialised product.</td>
</tr>
<tr>
<td><img src="image1" alt="One-off production" /></td>
<td></td>
</tr>
<tr>
<td><strong>Batch production</strong></td>
<td>[2 marks]</td>
</tr>
<tr>
<td><img src="image2" alt="Batch production" /></td>
<td></td>
</tr>
<tr>
<td><strong>Mass production</strong></td>
<td>[2 marks]</td>
</tr>
<tr>
<td><img src="image3" alt="Mass production" /></td>
<td></td>
</tr>
<tr>
<td><strong>Continuous production</strong></td>
<td>[2 marks]</td>
</tr>
<tr>
<td><img src="image4" alt="Continuous production" /></td>
<td></td>
</tr>
</tbody>
</table>
This question is about the use of colour.
You are advised to spend about 10 minutes on this question.

6 (a) Colours are often referred to as primary or secondary. Explain the difference between primary and secondary colours.

[3 marks]

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6 (b) Study the signs below.

Figure 5

Figure 6
Explain how colour is used to help communicate the meaning of these signs.

6 (b) (i) Figure 5

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6 (b) (ii) Figure 6

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6 (c) Giving an example, explain why the use of colour is important when considering the aesthetics of a product.

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Turn over for the next question
This question is about quality control and industrial processes.

You are advised to spend about 16 minutes on this question.

7 (a) Explain what is meant by the term just in time (JIT) when printing a graphic product. [3 marks]

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7 (b) Figure 7 shows a printed page from a child’s sticker book before it is trimmed and assembled into a complete book.

Figure 7
The marks around the edge of the page have different meanings.

Give the name of each mark labelled in Figure 7. Explain how each mark is used.  

[3 marks]

Label A ...........................................................................................................................................

Use ...................................................................................................................................................
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[3 marks]

Label B ...........................................................................................................................................

Use ...................................................................................................................................................
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[3 marks]

Label C ...........................................................................................................................................

Use ...................................................................................................................................................
.........................................................................................................................................................

7 (c) (i) The starfish is going to be foil blocked.

Explain this special printing effect.  

[2 marks]
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7 (c) (ii) Explain why foil blocking increases the cost of producing the sticker book.  

[2 marks]
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Give two safety precautions that are necessary when using the following equipment.

(a) Craft knife

Precaution 1

Precaution 2

(b) Aerosol spray

Precaution 1

Precaution 2
A designer wants to make a stencil of the sailing boat. The stencil will be used to put a painted border around the walls of a nursery.

Draw a suitable stencil of the sailing boat in the box below.
8 (d) Explain how Computer-Aided Manufacturing (CAM) equipment could be used to produce a stencil. [3 marks]

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