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Candidate surname

Other names

Centre Number					
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Pearson Edexcel

Level 1/Level 2 GCSE (9-1)

Friday 24 May 2019

Afternoon (Time: 1 hour 45 minutes plus your additional time allowance)

Paper Reference 1DT0/1F

Design and Technology

Component 1: Timbers

YOU MUST HAVE:	Total
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Calculator, ruler, HB pencil, protractor, compass	Marks
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A diagram booklet	
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INSTRUCTIONS

- **Use BLACK ink, ball-point pen or your usual method.**
- **FILL IN THE BOXES** at the top of the previous page with your name, centre number and candidate number.
- **Answer ALL questions.**
- **Answer the questions in the spaces provided – there may be more space than you need.**
- **Calculators may be used.**
- **Any diagrams may NOT be accurately drawn, unless otherwise indicated.**
- **You must SHOW ALL YOUR WORKING OUT with YOUR ANSWER CLEARLY IDENTIFIED at the END OF YOUR SOLUTION.**

INFORMATION

- **The total mark for this paper is 100.**
- **The marks for EACH question are shown in brackets**
 - **use this as a guide as to how much time to spend on each question.**

ADVICE

- **Read each question carefully before you start to answer it.**
- **Try to answer every question.**
- **Check your answers if you have time at the end.**

SECTION A – CORE

**ANSWER ALL QUESTIONS. WRITE YOUR ANSWERS
IN THE SPACES PROVIDED.**

- 1 (a) The materials that products are made from are
chosen because of their properties.**

**Figure 1 in the diagram booklet shows a table
of products.**

**For each of the products shown, give a
property of the material it is made from that
makes the material suitable for the product.**

The first one has been done for you.

- 1 (b) Figure 2 shows a table with the number of plastic bags given away in England.

FIGURE 2

YEAR	NUMBER OF BAGS GIVEN AWAY (BILLIONS)
2014	7.6
2015	5.4

Calculate the percentage reduction in the number of plastic bags given away between 2014 and 2015.

Give your answer to the nearest whole number.
(2)

Percentage reduction _____

- 1 (c) In 2015 charging for carrier bags was introduced resulting in a reduction in the number of bags being manufactured.**

Explain ONE negative effect of this reduction for the manufacturer. (2)

(TOTAL FOR QUESTION 1 = 8 MARKS)

- 2 Figure 3 in the diagram booklet shows a drawing of a fabric play cube for young children.**

The fabric play cube has a side length of 60 mm.

- (a) Name the communication technique that has been used to produce the drawing shown in Figure 3. (1)**

- (b) A prototype play cube was made from calico.**

Explain ONE reason for using calico for the prototype play cube. (2)

- 2 (c) The pattern for the prototype play cube was made from a single net.**

Draw a net for the play cube on the grid provided in the diagram booklet.

Do not include any seam allowance.

Use a thick dashed line – – – – to show where the net would be folded. (4)

- (d) Tracing paper was used to design the prototype play cube.**

Explain ONE reason why designers use tracing paper. (2)

(TOTAL FOR QUESTION 2 = 9 MARKS)

- 3 Figure 4 in the diagram booklet shows part of a solar powered garden light.**

The outer case is made from acrylic.

- (a) Give ONE property of acrylic that makes it an appropriate material from which to make the outer case. (1)**

- (b) The solar powered garden light is held off the ground by a stainless steel support.**

Explain ONE reason for using stainless steel for the support. (2)

- 3 (c) The manufacturer of the solar powered garden light wants to reduce its carbon footprint.**

Explain ONE way new and emerging technologies could be used to reduce the manufacturer's carbon footprint. (2)

- 3 (d) The solar cell used in the solar powered garden light costs $\frac{1}{12}$ th of the total cost of the product.

Calculate the cost of the solar cell if each light costs £4.97 to make.

Give your answer to two significant figures.

(2)

£ _____

- 3 (e) The manufacturer of the solar powered garden light employs different groups of people including apprentices.**

Explain TWO ways that the use of new and emerging technologies could affect the apprentices. (4)

1. _____

2. _____

(TOTAL FOR QUESTION 3 = 11 MARKS)

- 4 Figure 5 in the diagram booklet shows a drawing of a jewellery box made from mahogany.

The electronic component shown in Figure 6 in the diagram booklet is used in the jewellery box.

- (a)(i) Name the electronic component shown in Figure 6. (1)

4 (a)(ii)

The jewellery box uses a programmable component to turn on a musical tune when the lid is opened, that stays on until the lid is closed.

Figure 7 in the diagram booklet shows a partly completed flowchart for the programmable component.

Correctly label the DECISION OUTPUTS and add the remaining LINES and ARROWS on the flowchart to show how the programmable component:

- **turns on the musical tune when the lid is opened**
- **turns off the musical tune when the lid is closed.**

(3)

- 4 (b) Analyse the information in Figure 8 about the sources of mahogany.

Figure 8

SOURCES OF MAHOGANY	PERCENTAGE GROWN IN EACH AREA (%)
Native forests	7
National parks	30
Other	63

Complete the bar chart in the diagram booklet to show the percentage grown in each area.

The first one has been done for you. (2)

4 (c) A film company is considering launching a range of musical jewellery boxes based on its animated characters.

Discuss the different design strategies the company could use to generate initial ideas and to avoid design fixation. (6)

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TOTAL FOR SECTION A = 40 MARKS

SECTION B – TIMBERS

ANSWER ALL QUESTIONS. WRITE YOUR ANSWERS IN THE SPACES PROVIDED.

- 5 Figure 9 in the diagram booklet shows a design solution for a laptop tray unit together with some additional information.**

Study the diagram in the diagram booklet.

- (a) The laptop tray unit needs to be improved to include the following specification points. The laptop tray unit must:**

- fold away flat but still provide a rigid platform to work on**
- provide a method to hold the coffee cup without the risk of it being tipped over**
- provide an additional writing surface that is flat and wipe clean.**

continued on the following page

Use notes and sketches, on the outline for Question 5 (a) in the diagram booklet to show how the laptop tray unit could be modified to include these specification points.

You will be marked on how you apply your understanding of design and technology, not your graphical skills. (6)

5 (b) Figure 10 in the diagram booklet shows a medium density fibreboard (MDF) retail display unit for a pair of glasses.

Explain TWO ways that the retail display unit meets, or fails to meet, the criteria of providing a secure way to display the glasses. (4)

1. _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

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2.

(TOTAL FOR QUESTION 5 = 10 MARKS)

6 Figure 11 in the diagram booklet shows a toy creature made from sustainable timber.

(a) Explain TWO advantages of manufacturing the toy creature from sustainable timber. (4)

1. _____

continued on the following page

2.

- 6 (b) Figure 12 in the diagram booklet shows a side view of the head section of the toy creature separated from the main body.**

Use notes and sketches, in the space below, to show how the head section would be joined to the main body using a screw.

You will be marked on how you apply your understanding of design and technology, not your graphical skills. (4)

- 6 (c) Explain ONE reason for using different natural timbers for different parts of the toy creature. (2)**

6 (d) Figure 13 in the diagram booklet shows the main body for the toy creature.

The bodies are to be manufactured from pine in a batch of 1000.

Name TWO different techniques that could be used to batch produce the main body.

Explain ONE advantage of using each technique. (6)

Technique 1

Explanation

continued on the following page

Technique 2

Explanation

(TOTAL FOR QUESTION 6 = 16 MARKS)

7 Figure 14 in the diagram booklet shows a child's wooden toy made from pine and beech.

(a) Name ONE surface finish or surface treatment that could be applied to the pine back. (1)

- 7 (b) The wooden pegs have been cut from 600 mm lengths of stock material.

The stock material is 6 mm diameter wooden dowel.

Explain TWO reasons for using a stock-sized wooden dowel. (4)

1. _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

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2.

7(c) Figure 15 in the diagram booklet shows the dimensions for the body of the tumbling figure.

Calculate the maximum number of whole bodies that could be cut from a length of timber measuring 181 cm long by 4 cm wide.

Ignore the width of any cuts. (5)

Answer _____ **whole bodies**

7 (d) Explain TWO working properties of beech that make it an appropriate choice of material for the body of the tumbling figure. (6)

1. _____

continued on the following page

2.

(TOTAL FOR QUESTION 7 = 16 MARKS)

8 Figure 16 in the diagram booklet shows a pine roof truss for a house.

(a)(i) Explain ONE reason for applying a fireproof treatment to the roof truss. (2)

8 (a)(ii)

Explain ONE working property of pine that makes it suitable for the roof truss. (3)

8 (b) Explain TWO advantages of genetically engineering timber for use in the house building industry. (4)

1. _____

2. _____

8 (c) The roof trusses are manufactured in Europe and transported worldwide.

Figure 17 in the diagram booklet shows a table with information about the roof truss.

Analyse the information in Figure 17 in the diagram booklet.

Evaluate the roof trusses with reference to their social footprint including:

- **trend forecasting**
- **impact of logging on communities**
- **ease and difficulty of recycling and disposal. (9)**

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TOTAL FOR PAPER = 100 MARKS