

FOR OFFICIAL USE



National  
Qualifications  
2016

Mark

**X719/75/01**

**Design and Manufacture**

THURSDAY, 2 JUNE

9:00 AM – 10:30 AM



\* X 7 1 9 7 5 0 1 \*

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth

Day

Month

Year

Scottish candidate number

**Total marks — 60**

**SECTION 1 — 24 marks**

Attempt ALL questions.

**SECTION 2 — 36 marks**

Attempt ALL questions.

Write your answers clearly in the spaces provided in this booklet. Additional space for answers is provided at the end of this booklet. If you use this space you must clearly identify the question number you are attempting.

Use **blue** or **black** ink.

Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.

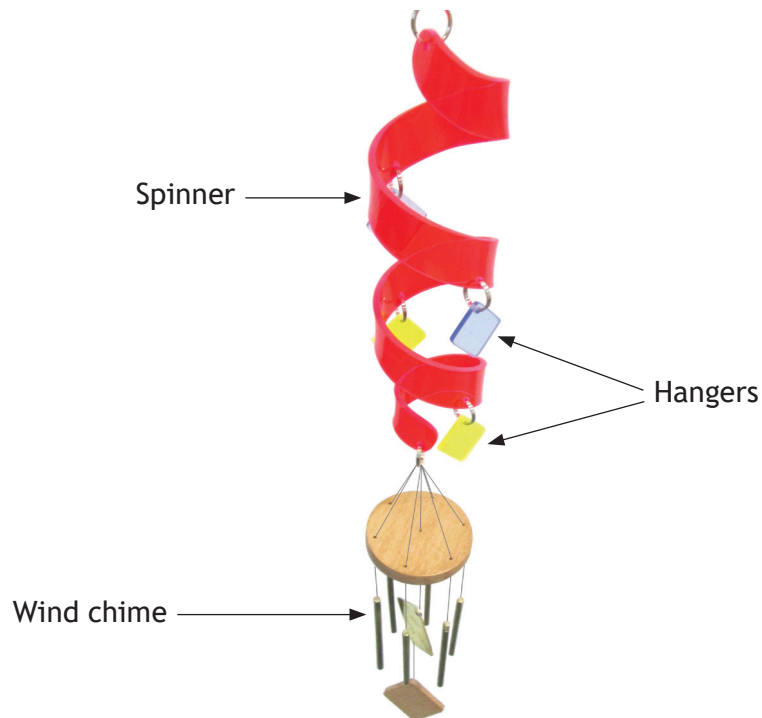


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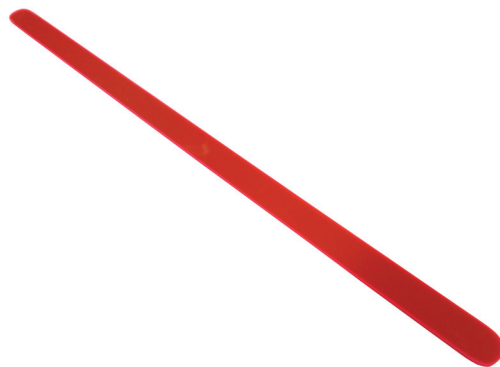
## SECTION 1 — 24 MARKS

Attempt ALL questions

1. A pupil's project for a combined spinner and wind chime is shown below.



- (a) The spinner was manufactured from a strip of low cost sheet thermoplastic as shown below.



- (i) State **two** reasons (other than low cost) why thermoplastic is a suitable material for the spinner.

2

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## 1. (a) (continued)

(ii) The strip of thermoplastic was formed into the shape shown below.



Describe how the twists in the thermoplastic strip could be formed. 2

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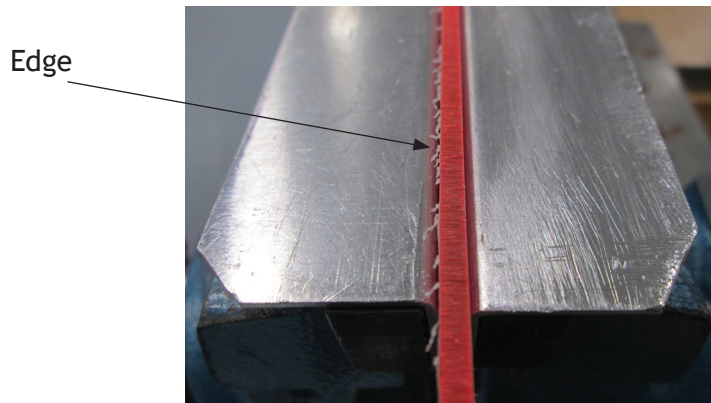
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[Turn over



1. (a) (continued)

The edges were finished before forming the strip.



(iii) State **two** reasons why finishing before forming was suitable.

2

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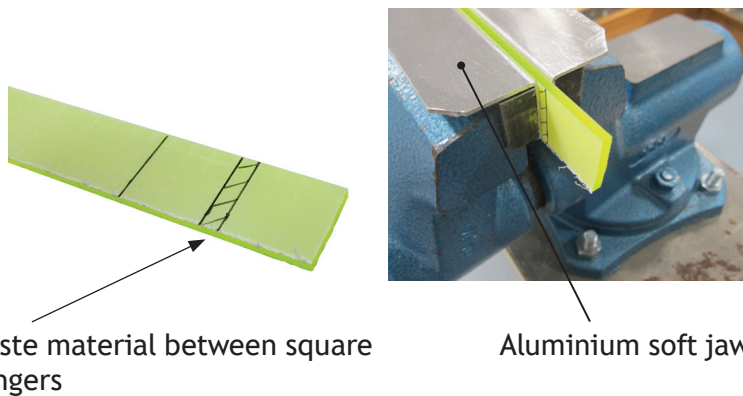


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(b) The thermoplastic hangers were marked out and then clamped in an engineer's vice using aluminium soft jaws.



(i) Explain why waste material was left between the two marked out squares.

1

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1. (b) (continued)

(ii) Explain why aluminium soft jaws were used to clamp the piece of thermoplastic.

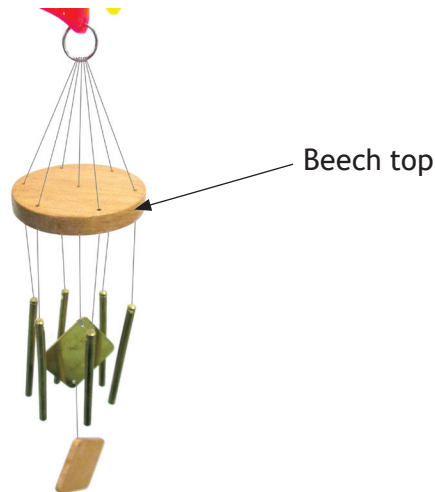
1

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(c) Beech was selected for the top of the wind chime.



State two reasons why beech was suitable for the top of the wind chime.

2

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(d) The beech was sourced from a sustainable forest.

Explain the term “sustainable forest”.

1

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[Turn over



## 1. (continued)

(e) A hole was drilled in the centre of the piece of beech as shown below.



- (i) Describe how the position of the central hole could be marked out accurately making reference to workshop tools. 2

*(You may sketch on the graphic to show your answer.)*

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- (ii) Varnish was applied to the beech top.



State **two** benefits of using varnish for the beech top. 2

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1. (e) (continued)

(iii) Describe how the beech top could be finished to a high standard.

3

*(You must refer to applying the finish and surface preparation stages to gain full marks.)*

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1. (continued)

(f) The chimes were made from a length of 6 mm diameter brass bar.



State **two** reasons why brass was a suitable choice of material for the chimes.

2

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SECTION 2 — 36 MARKS

Attempt ALL questions

2. A washing machine is shown below.



The manufacturer wishes to carry out an evaluation of the washing machine.

- (a) Describe a suitable test that could be carried out to evaluate the function of the washing machine. 2

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- (b) Describe **two** ways in which the designers could reduce the environmental impact of the washing machine. 2

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2. (continued)

(c) The metal hinge shown below was mass produced.



Metal hinge

(i) State the name of a suitable process which would allow the hinge to be manufactured with minimal finishing. 1

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(ii) State the name of a suitable material for the hinge. 1

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(iii) Prior to final manufacturing, the hinge was rapid prototyped on a 3D printer. Describe **two** benefits to the manufacturer of rapid prototyping the hinge. 2

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3. (a) (continued)

(iii) Aesthetics

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(b) The design was created to satisfy a market niche and was influenced by market pull.

(i) Explain the term “*market niche*”.

1

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(ii) Explain the term “*market pull*”.

1

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(c) The thermoplastic outer casing of the wrist band was manufactured by the process of injection moulding.

State the name of a suitable thermoplastic that could have been used and describe why it is suitable.

2

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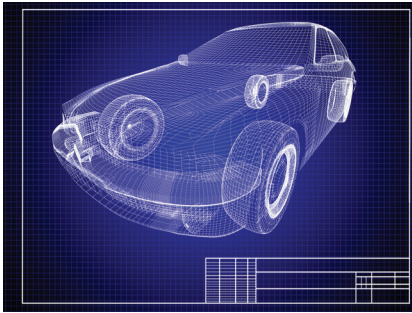


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4. When designing cars the design team will use a range of models.



(a) State **two** benefits to the designer of using computer generated models. 2

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Standard components are often used in car production.

(b) Describe **two** benefits to the manufacturer of using standard components. 2

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The cars will be produced using computer aided manufacturing (CAM) systems.

(c) Describe **two** drawbacks to the manufacturer of using these systems. 2

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## 4. (continued)

The cars were launched under a successful brand name.

- (d) Describe **two** benefits of launching a product under a successful brand name.

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5. A mood board is shown below.



(a) Describe how a mood board could be used to generate ideas.

2

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(b) The following **open design brief** was given to the designer:

*“Design lighting inspired by the Art Deco design movement.”*

State **two** benefits of an open design brief.

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## 5. (continued)

- (c) Designers use a range of graphic techniques throughout the design process.

State the name of **one** graphic technique that the designer may use at each of the following stages of the design process **and** explain why it would be suitable.

*(A different graphic technique and explanation must be used for each stage.)*

- (i) Initial Ideas

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- (ii) Planning for manufacture

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[END OF QUESTION PAPER]



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MARKS

DO NOT  
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MARGIN

ADDITIONAL SPACE FOR ANSWERS



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**MARKS** DO NOT  
WRITE IN  
THIS  
MARGIN

ADDITIONAL SPACE FOR ANSWERS

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\* X 7 1 9 7 5 0 1 1 9 \*

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