

Design & Technology

AQA A-Level

Paper 2 – Designing and Making Principles

1 hours 30 minutes

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

Advice

- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don't spend too much time on one question

Good luck!

80 marks

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Section A – Product Analysis

Q1) The image below shows two water bottles.



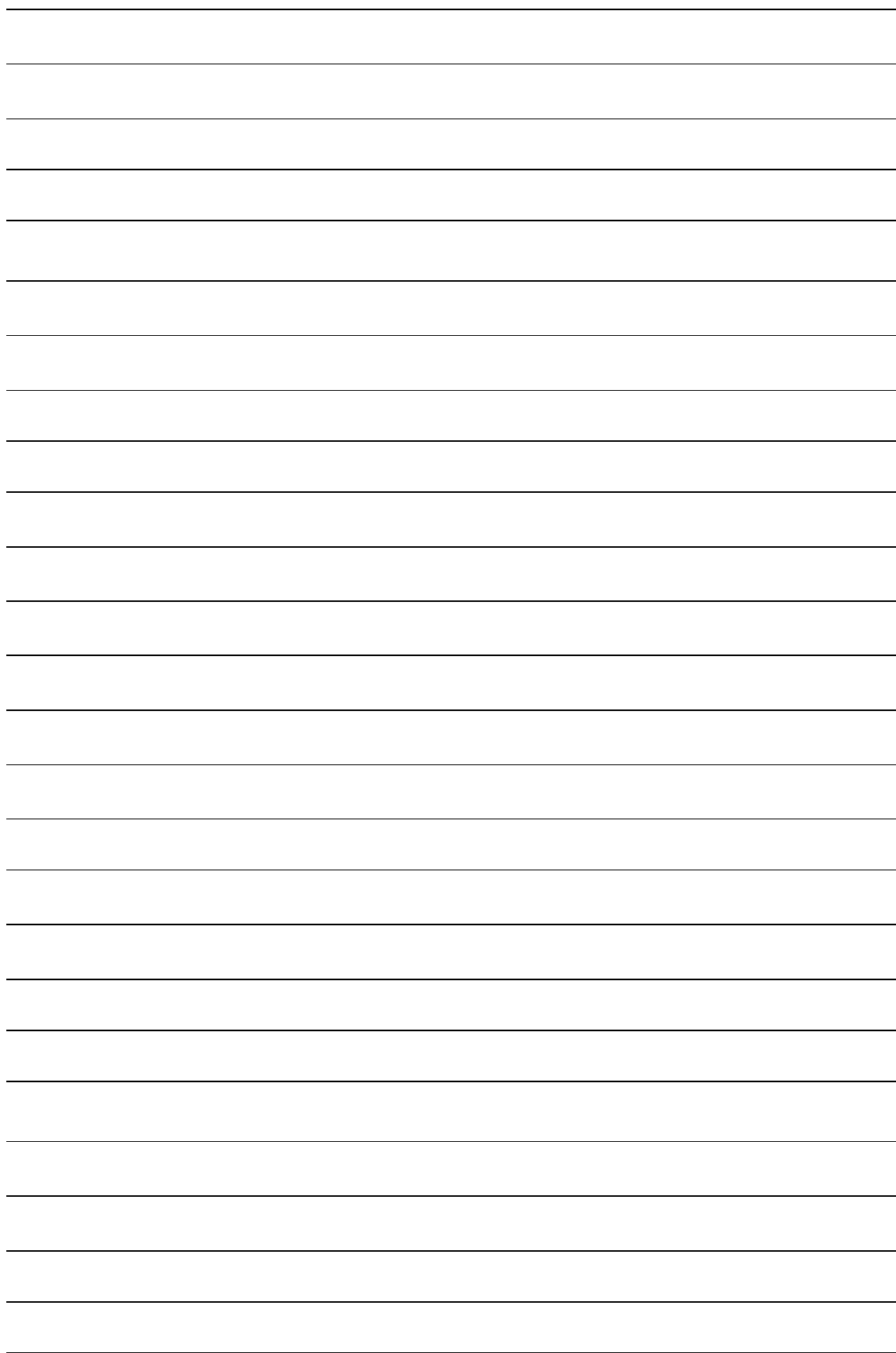
	Plastic bottle	Metal bottle
Material	Polypropylene	Stainless steel
Method of manufacture	Injection moulding	Deep drawing

Compare the two water bottles shown.

In your answer you should refer to:

- Product function
- Manufacturing processes
- Suitability for sports

(12 marks)



Q2) The stainless steel bottle has been chosen for manufacturing. Part of the bottle will be turned using a CNC lathe. The table below shows different RPMs needed for different densities.

RPM	Density (kg/m ³)
1200	14
1500	18
1800	22

If the selected RPM for the material is 800, calculate the density of the stainless steel. **(4 marks)**

[illegible]

Q4) The image below shows a kettle that is used to boil water.



Give 4 ergonomics features in the design of the kettle. **(4 marks)**

Q5) Explain four reasons why third party feedback is important in the development of a product. **(4 marks)**

[illegible]

Q7) A metalworking company will take 6 hours to complete a riveting job that has 235 rivets.

A hole can be drilled and rivetted every two minutes.

Cost of rivets: £2.50 per pack of 50.

Cost of rivet guns: £38.25 each.

Percentage waste allowance: 7.5%.

The company needs to buy new rivet guns to complete the job.

Calculate the total cost of rivets and rivet gun that need to be purchased to complete this job.

Show all of your workings.

(5 marks)

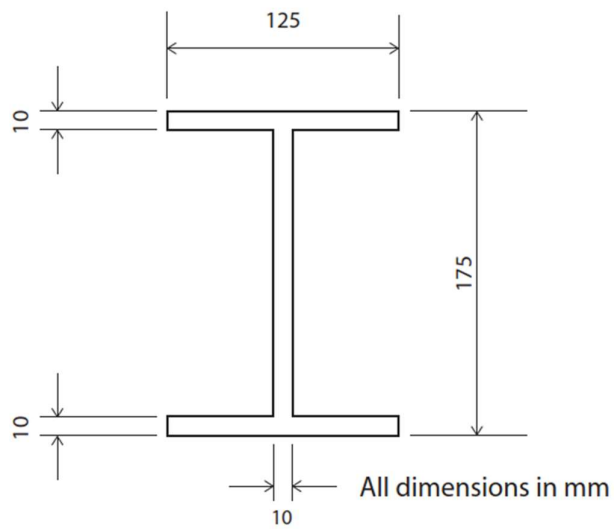
[illegible]

[illegible]

Q10) Identify the mark shown in the image below. **(1 mark)**



Q11) The image below shows a cross section of a cast iron beam.



Calculate the cross-sectional area of the cast iron beam. **(5 marks)**

[illegible]

Q13) Three of the six Rs are given below. Name the other 3.

- Reduce
- Reuse
- Recycle

(3 marks)

Q14) Discuss the issues associated with the use of biomass and biofuels as alternative sources of energy. **(6 marks)**

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

Q15) Designers uses many sources for inspiration. Name three sources a designer may use for inspiration. **(3 marks)**

END OF QUESTIONS