DTBase©

Design & Technology
AQA A-Level

Sample Set 1 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

Section A – Product Analysis

Q1) The image below shows two different types of garden compost bins

	Timber compost bin	**Polymer compost bin**
Material	Timber planks treated with preservative	Injection moulded polypropylene
Construction	Slotted panels assembled using corner posts	One-piece body with hinged lid and removable base panel
Features	Natural appearance, allows air flow through gaps in timber slats	UV-stabilised plastic, lightweight, weather resistant

Compare the suitability of the two compost bins shown for long-term outdoor use. **(6 marks)**

Q2) A gardener is deciding between buying Figure 1 and Figure 2 compost bins.

- The polymer compost bin has a volume of 420 litres and costs £45.
- The timber compost bin has a volume of 600 litres and costs £75.

Work out the cost per litre of capacity for each bin. Give your answers in pence, rounded to 1 decimal place. **(4 marks)**

Q3) A company is developing a new wooden compost bin to market as an eco-friendly product.

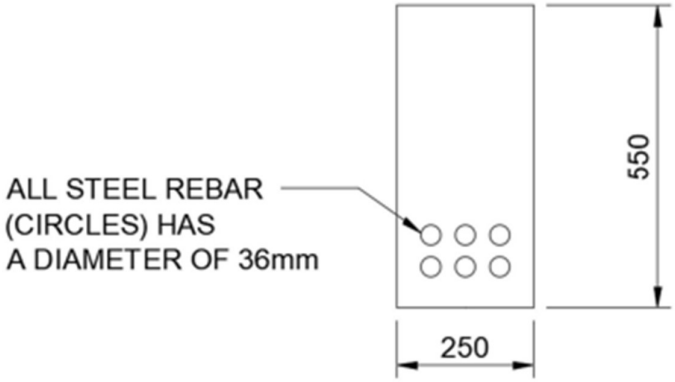
Explain how using Forest Stewardship Council (FSC) certified timber could influence decisions in the design, manufacture, and marketing of the compost bin. **(4 marks)**

Q4) Designers and manufacturers play an important role in reducing the environmental impact of products.

Discuss how designers and manufacturers can address environmental concerns in relation to:

- the use of sustainable materials and components
- the packaging of products **(6 marks)**

Q5) A reinforced concrete beam is being designed. The beam is 6m long and the section is show below. What is the volume of concrete needed for the beam. All measurements are in mm. **(4 marks)**



Q6) Outline the ways a design team can reduce the time from idea conception to product release **(6 marks)**

TURN OVER FOR SECTION B

Section B – Commercial Manufacture

Q7) Outline the design features and/or manufacturing techniques that have made the company Dyson successful. **(6 marks)**

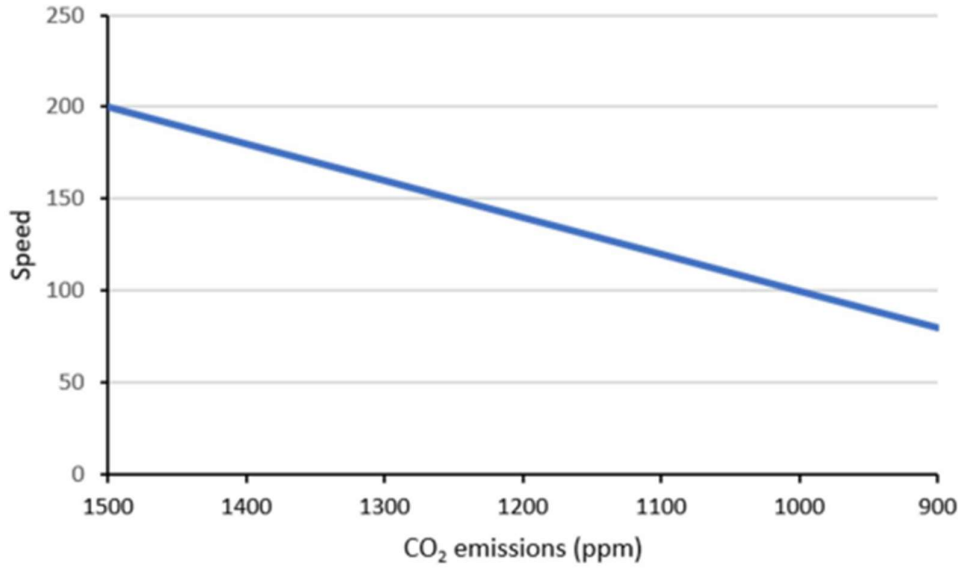
Q8) Before products are sold commercially, they must undergo rigorous testing.

Explain two reasons why commercial products are tested before they are made available for sale. **(2 x 2 marks)**

Reason 1:

Reason 2:

Q9) Calculate the CO_2 emissions when the car is not moving **(4 marks)**



Q10) Margaret Calvert helped to design the UK's modern road signage system.

Explain the importance of Margaret Calvert's work in the development of road signs and how it reflects key principles of effective graphic communication. **(4 marks)**

Q11a) Manufacturers use project management strategies such as scrum when designing and developing new products and production systems.

Give the three roles within the scrum team. **(3 marks)**

Q11b) Outline the key features of the scrum process **(6 marks)**

Q12) The Image below shows a modern smart watch that offers a wide range of functions such as fitness tracking, health monitoring, calendars and music.

Discuss how modern technology and miniaturisation of components have enabled the development of smart watches. **(9 marks)**

Q13a) Identify the logo below **(1 mark)**

Q13b) Explain the need for fair trade and give one example of people who benefit from it. **(4 marks)**

Q14) Describe the following two types of investigation

Give examples to show how they help when designing. **(2 x 3 marks)**

Primary Research

Secondary Research

Q15) Copper costs £4 per kg. Zinc costs £3.10 per kg. Copper and zinc are mixed in the ratio 4:1 to make brass. Work out the cost of 7 kilograms of brass. **(3 marks)**

END OF PAPER