DTBase©

Design & Technology
Edexcel GCSE

Papers and Boards

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!

Q1. Which property describes how well a paper or board takes ink?

A Flexibility

B Printability

C Biodegradability

Q2. Which paper is see-through, so it can be used to copy a drawing?

A Cartridge paper

B Tracing paper

C Copier paper

Q3. Which board has a fluted middle layer that makes it good for protective packaging?

A Corrugated board

B Solid white board

C Foam board

Q4. Which board would be best for high quality printed luxury packaging?

A Solid white board

B Corrugated board

C Folding boxboard

Q5. Which paper is thick, slightly textured and good for sketching with pencils?

A Copier paper

B Tracing paper

C Cartridge paper

Q6. What are most papers and boards made from?

A Wood pulp

B Crude oil

C Iron ore

Q7. For each of the products below, give a property of the material it is made from that makes the material suitable for the product.

Q7a. Solid white board burger box. **(1 mark)**

Q7b. Folding boxboard breakfast cereal box. **(1 mark)**

Q7c. Cartridge paper sketch book. **(1 mark)**

Q8. The weight of paper and cardboard is measured in GSM.

State the full meaning of GSM. **(1 mark)**

Q9. Tracing paper was used to design a prototype play cube.

Explain one reason why designers use tracing paper. **(2 marks)**

Q10. Origami is a folded paper art form. An origami rabbit has been made from copier paper.

Q10a. Give one property of copier paper that makes it an appropriate choice of material for the origami rabbit. **(1 mark)**

Q10b. Explain one advantage of using recycled copier paper to manufacture the origami rabbit. **(2 marks)**

Before it is folded, the starting shape for the origami rabbit is a square measuring 21.0 cm × 21.0 cm. The square is cut from a standard sheet of A4 copier paper, which measures 29.7 cm × 21.0 cm.

Q10c. Calculate the percentage of waste paper. Give your answer to the nearest whole number. **(4 marks)**

Q11. A vegetable growing frame is delivered in a box made from corrugated board.

Explain two benefits of using corrugated board to manufacture the box. **(4 marks)**

1

2

Answers

Q1. B
Q2. B
Q3. A
Q4. A
Q5. C
Q6. A

Q7a.

Any one property (1 mark): rigid/stiffness; hygienic and safe for food use; pure with no smell or taste/inert; good printability; good insulator of heat.

Q7b.

Any one property (1 mark): excellent for scoring/bending/folding; rigid; hygienic/safe for food use/non-toxic; pure with no smell or taste; good printability/takes ink well; stiffness.

Q7c.

Any one property (1 mark): opaque; absorbent; rough/textured surface.

Q8.

Grams per square metre (1). This is the only acceptable answer.

Q9.

Any one reason why designers use tracing paper (1 mark) and a linked justification (1 mark):

- It is transparent/translucent/see-through (1), which means it can be placed over a drawing and drawn on to make a copy/trace the image (1)
- It can be placed over a drawing and drawn on (1), which means it can be used to transfer images/as an overlay to add extra information or detail (1)

Q10a.

Any one property (1 mark): flexibility; easy to bend; easily creased/holds its shape when folded; biodegradable; easy to fold. Do not accept "foldable" or "folded" on their own.

Q10b.

Any one advantage (1 mark) and a linked justification (1 mark). Do not accept "recycled" on its own:

- Using recycled paper reduces the need to make new paper/is more sustainable/lowers the carbon footprint (1), which reduces the number of trees cut down for pulp/reduces deforestation/reduces energy use and emissions (1)
- Recycling paper stops it going to landfill/reduces waste (1), which keeps landfill space for materials that cannot be recycled (1)

Q10c.

- Area of the A4 sheet: $29.7 \times 21.0 = 623.7\ cm^2$ (1)
- Area of the square: $21.0 \times 21.0 = 441\ cm^2$ (1)
- Waste percentage: $(623.7 - 441) \div 623.7 \times 100 = 29.29\%$ (1)
- Answer rounded to the nearest whole number: 29% (1)
- Alternative: waste area = $(29.7 - 21.0) \times 21.0 = 182.7\ cm^2$, then $182.7 \div 623.7 \times 100 = 29.29\%$

Q11.

Any two benefits (1 mark each) and a linked justification of each (1 mark each), up to 4 marks:

- Corrugated board is lightweight (1), therefore it will not add much to postal delivery charges/is not heavy to lift (1)
- Corrugated board has good impact resistance/is fluted (1), therefore it protects the frame/parts inside during transportation (1)
- Corrugated board is widely recyclable/biodegradable/can be made from recycled materials (1), therefore it does not need to go to landfill/is better for the environment (1)
- Corrugated board takes ink well/has good printability (1), therefore the box can be printed with the company logo/branding/recycling symbols (1)
- Corrugated board is cheap/readily available (1), therefore it helps keep packaging/production costs down (1)