DTBase©

Design & Technology
Eduqas GCSE

Papers and boards: scales of production

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 scale of production has the lowest set-up cost but the highest unit cost?

A One-off

B Batch

C Mass

Q2. Which of these is a disadvantage of batch production?

A Products cannot be made to a set number

B Down time between batches

C Materials cannot be bought in bulk

Q3. What is a template?

A A device that holds work and guides a tool

B A shape drawn round to mark out the same outline many times

C A stop that limits how far a tool can go

Q4. Colour separation splits a full colour image into which four process colours?

A Red, green, blue and white

B Black, white, grey and silver

C Cyan, magenta, yellow and key (black)

Q5. In offset lithography, what transfers the image from the plate onto the paper?

A A rubber blanket cylinder

B A steel cutting die

C A fine mesh screen

Q6. Which printing process is used for packaging, labels and printing onto corrugated board?

A Gravure

B Digital printing

C Flexography

Q7. Business cards are printed commercially.

Q7a. Underline the word given to the process used to put a document into the correct order before printing. Imposition Duplex Proof-reading **(1 mark)**

Q7b. Quality control markings are printed outside the trim area of a printing plate. Name two of these quality control markings and describe their importance to the printing process. **(4 marks)**

Q7c. Greetings cards are manufactured using a duplex printer. State one reason why a duplex printer is used. **(1 mark)**

Q8. A cat shelter is made from corrugated cardboard. A template is used to mark out the front piece of the shelter. Explain two advantages of using a template to mark out the front piece of the cat shelter when manufacturing in large quantities. **(4 marks)**

Q9. The sails of a model windmill are to be manufactured from corrugated board in a batch of 1000. Each sail is 100 mm × 25 mm and has fold lines. Name two different techniques that could be used to batch produce the sails. Explain one advantage of using each technique. **(6 marks)**

Q10. A point of sale display is made from corrugated board and delivered flat-packed. Explain two reasons for manufacturing the flat-packed point of sale display in batches. **(6 marks)**

Q11. A plant carrier is made from corrugated board and has labels printed on copier paper.

Q11a. The plant carriers are subjected to quality control checks during manufacture. Explain one advantage of carrying out a quality control check on the plant carriers during manufacture. **(3 marks)**

Q11b. Explain two reasons why printing would be used to manufacture the labels for the plant carriers. **(4 marks)**

Q12. Sets of self-assembly 3D card beetles for children are made from printed laminated cardboard. They are designed using CAD and manufactured using CAM.

Q12a. Describe one advantage of using CAM to manufacture the 3D beetles. **(2 marks)**

Q12b. A manufacturer who laser cuts the 3D card beetle sets owns 25 laser cutting machines. Each set of 3D card beetles takes 5 minutes to laser cut. Calculate how many 3D card beetle sets would be cut in an 8-hour shift using 25 laser cutting machines. Show all workings. **(5 marks)**

Answers

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

Q7a.

Imposition (1). Only acceptable answer.

Q7b.

Two markings, up to 2 marks each: 2 marks for an appropriate answer with detail, 1 mark for an answer lacking detail. For example:

- Registration marks: printed outside the trim area so the printer can line up the separate plates accurately for multiple colour print jobs
- Colour bars: squares of colour printed on the area to be trimmed off, which the press operator uses to check that colour density and consistency are kept
- Crop (trim) marks: lines in the corners of the sheet that show the printer where to trim the paper; used to create bleeds where colour needs to go right to the edge of the paper

Example of a 2 mark answer: crop marks are used to trim documents printed on oversized paper, so the colour prints right up to the edge. Example of a 1 mark answer: crop marks show where to cut the paper to size.

Q7c.

A duplex printer prints on both sides of the material (1). Credit any other appropriate response.

Q8.

Two advantages (1 each), each with a linked justification (1). For example:

- It can be quickly drawn or traced around (1), saving time and speeding up production (1)

- Each part will be identical (1), so all the parts will line up and fit together (1)
- The template can also mark out other features, such as the centre for the printed design (1), making sure it is in the correct place (1)
- It needs little skill to use (1), so workers with little or no technical knowledge can use it (1)

Q9.

Two techniques (1 each), each with two linked justifications (1) + (1). For example:

- CAM, laser cutter or CNC cutter (1): it can repeat cuts (1), so identical components are made (1); or the power settings can be adjusted (1) so the material can be cut or marked for folding (1)
- Cutting jigs or dies (1): used to cut the shapes or parts to size (1), so little or no marking out is needed (1)
- Folding jig (1): makes sure all the sails are folded equally (1), to the same angle (1)

Q10.

Two reasons (1 each), each with two linked justifications (1) + (1). For example:

- Once the batch is made the production line can be changed (1), so other products can be made (1), keeping staff employed and machinery in use to make profits (1)
- Specific orders from retailers can be met (1), so manufacturers do not have to hold lots of stock (1), and do not have lots of money tied up in stock (1)
- Batch production can respond quickly to customers' demands (1), so new orders can be turned around quickly (1), making sure supplies reach retailers when ordered (1)

Q11a.

An advantage (1) and two linked justifications (1) + (1). For example:

- The carrier can be checked for dimensional accuracy (1), so tooling can be checked or changed if the compartments are the wrong size (1), reducing waste and rejects (1)

- The carrier can be checked for stability (1), so edges and glued joints can be inspected (1), reducing the risk of it falling apart (1)
- The position of the labels can be checked (1) and gluing adjusted (1), so labels are not put on in the wrong place or upside down (1)
- The edges can be checked (1), so the cutting tool is replaced at the right time (1), and the outline needs no further processing (1)
- Registration and colour density can be checked (1), so plates can be adjusted or inks replaced (1), and the label is readable, not blurred (1)

Q11b.

Two reasons (1 each), each with a linked justification (1). For example:

- Labels can be printed in small batches (1), so the same carrier design can be used for a range of different plants (1)
- Printed labels have a short lead time (1), so more can be made quickly if demand for a plant increases (1)
- Printing allows text and coloured images (1), giving a more visually attractive package than printing directly onto the carrier (1)
- Printing can be used with different types of paper (1), so other materials could be used without changing the label design (1)

Q12a.

1 mark for a correct advantage and 1 mark for a clear description. For example:

- CAM machines produce large quantities in a short time (1) because of their processing speed, compared with traditional methods (1)
- Every product made is the same, with little or no difference (1), giving reliability for client and consumer (1)
- Fewer errors are made in production (1); accuracy means less waste of raw materials (1)
- Changes to size, shape or colour can be made with very little down time (1); the exact number of products needed can be made easily

Q12b.

1 hour = 60 minutes (1). 8 × 60 = 480 minutes (1). 480 ÷ 5 = 96 sets per machine (1). 96 × 25 (1) = 2,400 sets in 8 hours (1). Credit any other appropriate calculation.