

Please check the examination details below before entering your candidate information

Candidate surname					Other names				
Centre Number					Candidate Number				
Pearson Edexcel Level 3 GCE									
Monday 2 June 2025									
Morning (Time: 2 hours 30 minutes)					Paper reference		9DT0/01		
Design and Technology (Product Design) Advanced COMPONENT 1									
You must have: Calculator, ruler								Total Marks	

Instructions

- Use **black** ink or ball-point pen (HB pencil may be used for questions that require drawing or sketching).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 120.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- For questions requiring mathematics, you must **show all your working out** with **your answer clearly identified** at the **end of your solution**.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Pearson

Answer ALL questions. Write your answers in the spaces provided.

- 1 Figure 1 shows a densitometer used in the printing industry.



Figure 1

- (a) Give **two** uses of a densitometer in the printing industry.

(2)

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- (b) Explain **two** benefits of screen printing.

(4)

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(Total for Question 1 = 9 marks)

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2 Figure 2 shows a pop rivet gun.

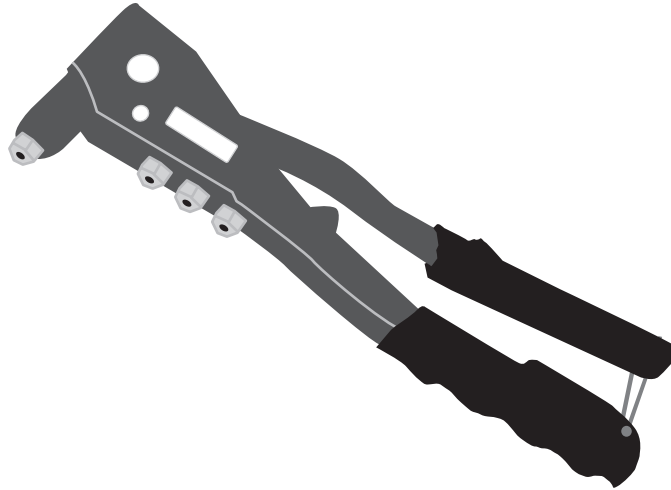


Figure 2

The pop rivet gun uses pop rivets.

(a) Give **two** benefits of using pop rivets.

(2)

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- (b) 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 guns that need to be purchased to complete this job.

Show all of your workings.

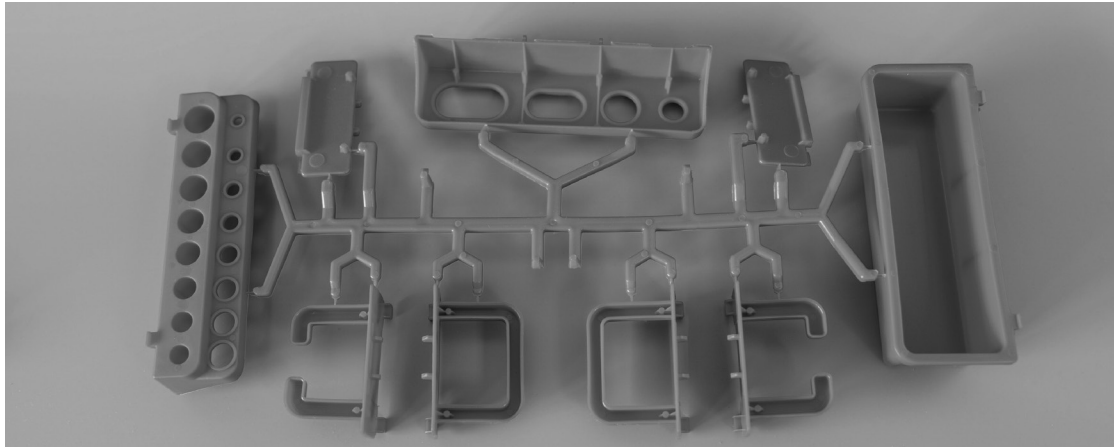
(5)

Answer £

(Total for Question 2 = 7 marks)



3 Figure 3 shows some injection moulded components.



(Source: © luchschenF/Shutterstock)

Figure 3

(a) Explain why thermoplastics are used to injection mould these components.

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(b) Describe, using labelled sketches, the injection moulding process.

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(c) Explain **two** drawbacks of injection moulding.

(6)

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4 Manufacturers need to ensure that their products are good quality, free of defects and meet the needs of consumers.

(a) Give **three** types of quality monitoring system.

(3)

(b) There are four stages in a product's life cycle:

- Introduction Stage
- Growth Stage
- Maturity Stage
- Decline Stage.

Each stage of a product's life cycle has different impacts on costs and profit.

Outline the impacts on costs and profit associated with the Introduction Stage.

(6)



- (c) Manufacturers have to manufacture to set standards to be able to distribute their products within domestic and international markets.

Name **two** organisations that produce the standards that UK manufacturers might need to follow.

(2)

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- (d) Discuss how a manufacturer can maintain their share of the market during the Maturity Stage of their product's lifecycle.

(9)

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(Total for Question 4 = 20 marks)



5 Figure 4 shows a cross section through a steel beam.

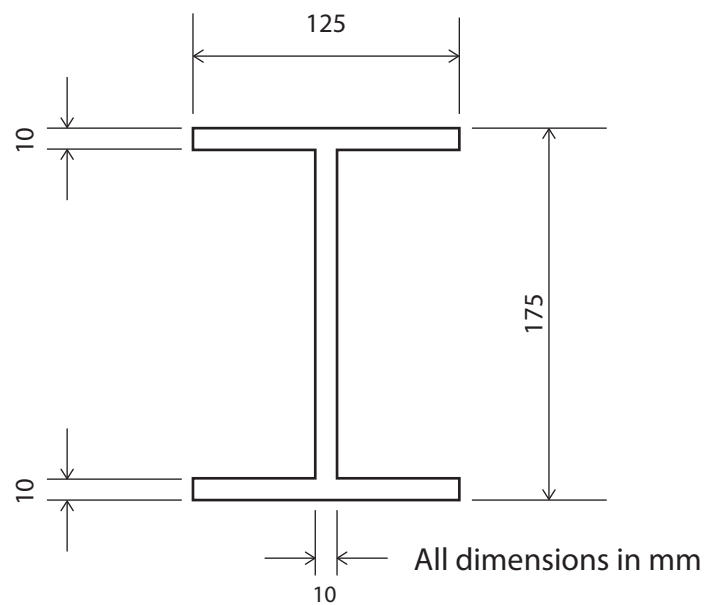


Figure 4

(a) Calculate the cross-sectional area of the beam.

Give your answer in m^2 to 4 decimal places.

Show all of your workings.

(5)

Answer m^2



(b) The steel beam is 5 m long.

A total of 12 beams are required.

Steel weighs 7.9 tonnes/m³.

Calculate the total weight in tonnes of the 12 steel beams.

Show all of your workings.

(3)

Answer Tonnes

(Total for Question 5 = 8 marks)



6 Figure 5 shows running shorts manufactured using a manmade fibre.

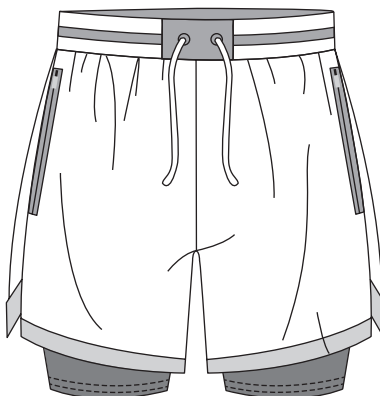


Figure 5

(a) Give **two** manmade fibres used in the textile industry.

(2)

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(b) Explain **two** uses of anthropometric data in the fashion / clothing industry.

(6)

1

2



- (c) The manufacturer will use automated storage and retrieval systems (ASRS) in their onsite storage facilities.

Discuss the benefits of automated storage and retrieval systems.

(6)

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- (d) Designers need to consider the environment when producing designs for new consumer goods.

Give **two** end of life design considerations for consumer goods.

(2)

1

2

- (e) The table below shows the number of items produced in a factory on each day of a working week.

Monday	Tuesday	Wednesday	Thursday	Friday
145	160	155	115	

The factory is operational for 16 hours each day on Monday to Thursday and 8 hours on a Friday.

Hourly output = (total items produced)/(hours worked) or $O = P/T$

Calculate how many items will need to be produced on Friday to achieve an overall mean hourly output of 9 items per hour over the full week.

Show all of your workings.

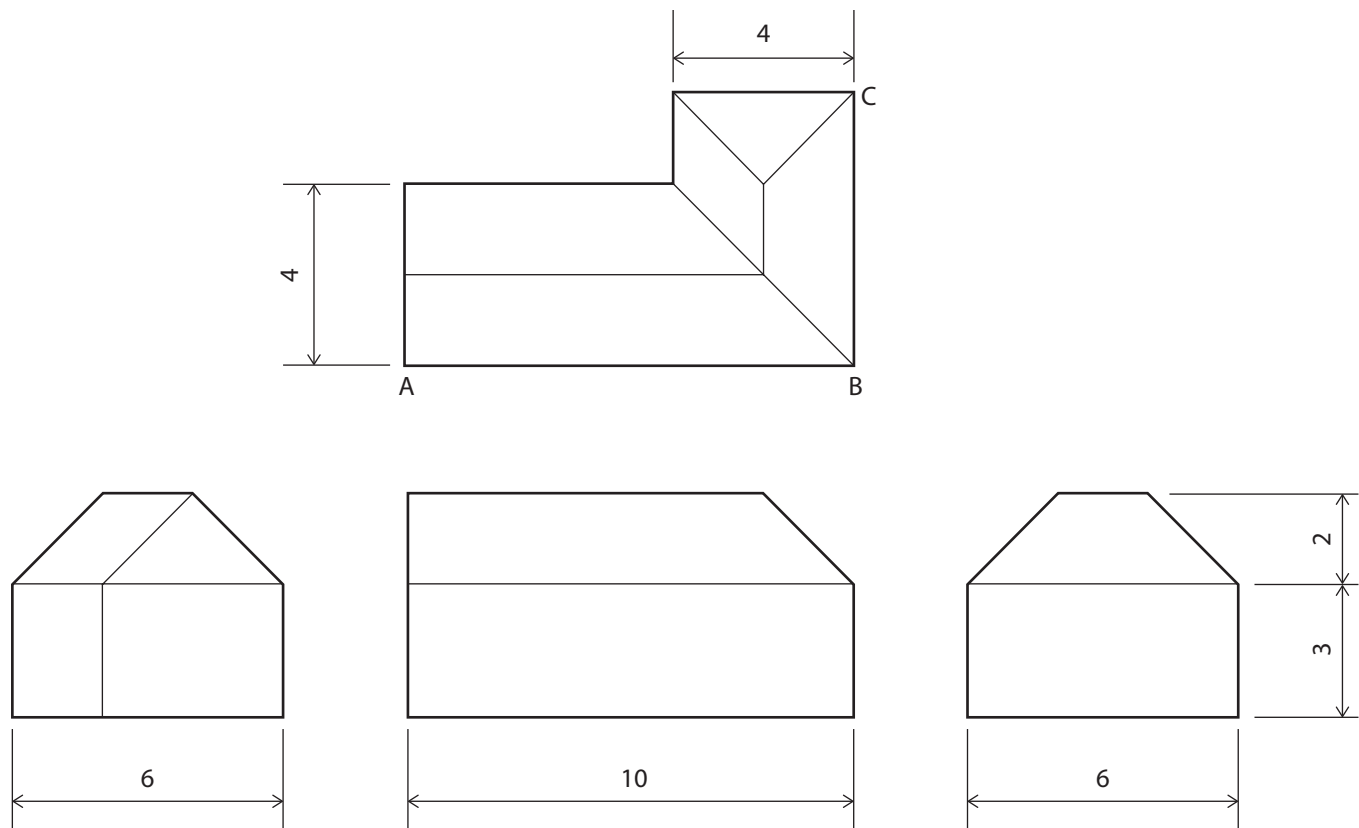
(3)

Answer

(Total for Question 6 = 19 marks)



7 Figure 6 shows a third angle orthographic projection of a building.



All dimensions in m

Figure 6

Draw an accurate isometric projection of the building.

Use the isometric grid provided starting with line A-B-C as your baseline.

Each segment of the grid equals 1 m.

Dimensioning of the isometric projection is not required.

The pitch (angle) of the roof is 45° .

(6)





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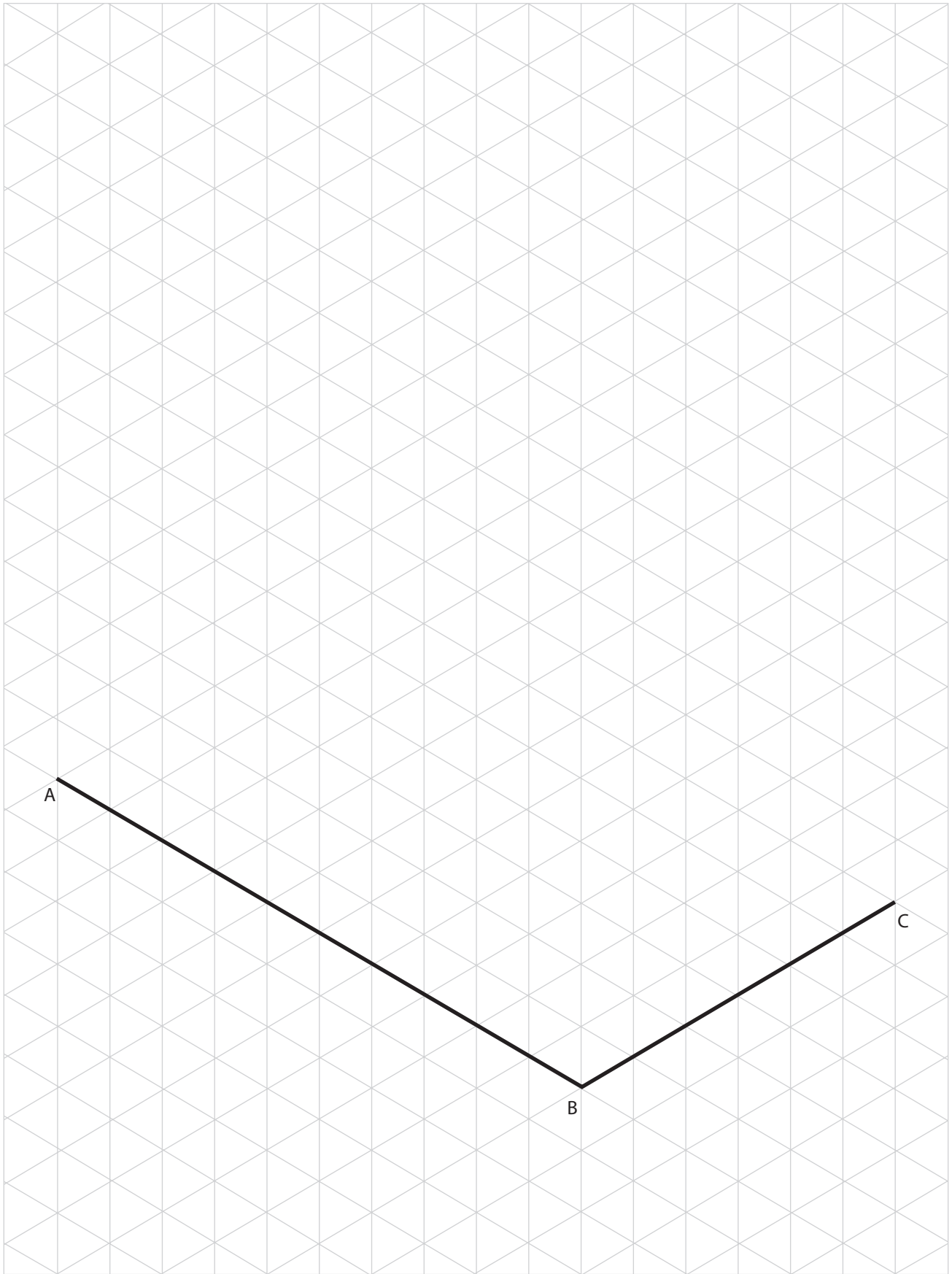
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(Total for Question 7 = 6 marks)



P 7 9 9 3 1 R A 0 1 9 2 8



- 8 Figure 7 shows a service station designed in the 'Googie' architectural style. Googie is the name given to the architectural style that emerged from the Streamline Moderne movement.



(Source: © Neil Lockhart/Shutterstock)

Figure 7

Discuss how the design of the service station was influenced by Streamline Moderne movement philosophies in the Googie architectural style.

(9)



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(Total for Question 8 = 9 marks)



9 Discuss the potential conflicting influences of aesthetics and ergonomics when designing car interiors.

(9)

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(Total for Question 9 = 9 marks)



10 Liquid crystal displays (LCDs) are a modern material used in electronic products such as televisions.

Explain **two** benefits and **one** drawback of LCDs when used in televisions.

(9)

Benefit 1

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Benefit 2

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Drawback 1

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(Total for Question 10 = 9 marks)

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11 Figure 8 shows a covered outdoor dining area.



Lattice
side panel

Figure 8

- Constructed from pressure treated softwood sourced from sustainable forests
- Stainless steel screws and bolts used for assembly
- Requires self-assembly
- Some sections come as readily assembled components: roof slope (x2), lattice side panels (x2), curved seat back (x2), bench seat (x2), table supports (x2), table top and boarded base
- Assembly time 4 to 6 hours
- Roof assembled at ground level and lifted into position
- Natural timber roof finish made from overlapping strips of softwood
- Fixed table and seating for 6 people
- Overall weight 275 kg
- Cost £1,995.00.



Evaluate how the designer of the covered outdoor dining area has addressed aesthetics and user requirements for outdoor lifestyles and dining.

(12)

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(Total for Question 11 = 12 marks)

TOTAL FOR PAPER = 120 MARKS

