

Tuesday 31 January 2012 – Morning

A2 GCE DESIGN AND TECHNOLOGY

F524/01 Product Design: Component 1

Candidates answer on the Question Paper.

OCR supplied materials:

None

Other materials required:

- A calculator may be used

Duration: 1 hour



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| Candidate forename | | Candidate surname | |
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| Centre number | | | | | | Candidate number | | | | |
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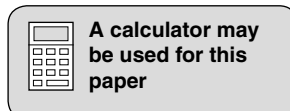
MODIFIED LANGUAGE

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- This paper is to be taken with F524/02 in the same examination session of **2 hours 30 minutes**. The times given on the front of each paper are advisory.
- Components 1 and 2 should be available to candidates for the full session.
- Answer **ONE** question only from component 1 and **ONE** question only from component 2.
- Component 1 and Component 2 choices can be from different material areas although it is envisaged that most candidates will select the same material area.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Do **not** write in the bar codes.
- The discuss question will be used to assess your Quality of Written Communication.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your Candidate Number, Centre Number and question number(s).

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **36**.
- All dimensions are in mm.
- Where appropriate calculations should be shown.
- This document consists of **44** pages. Any blank pages are indicated.



1 Built Environment and Construction

Fig. 1 shows an elevation of an internal non-load bearing partition wall.

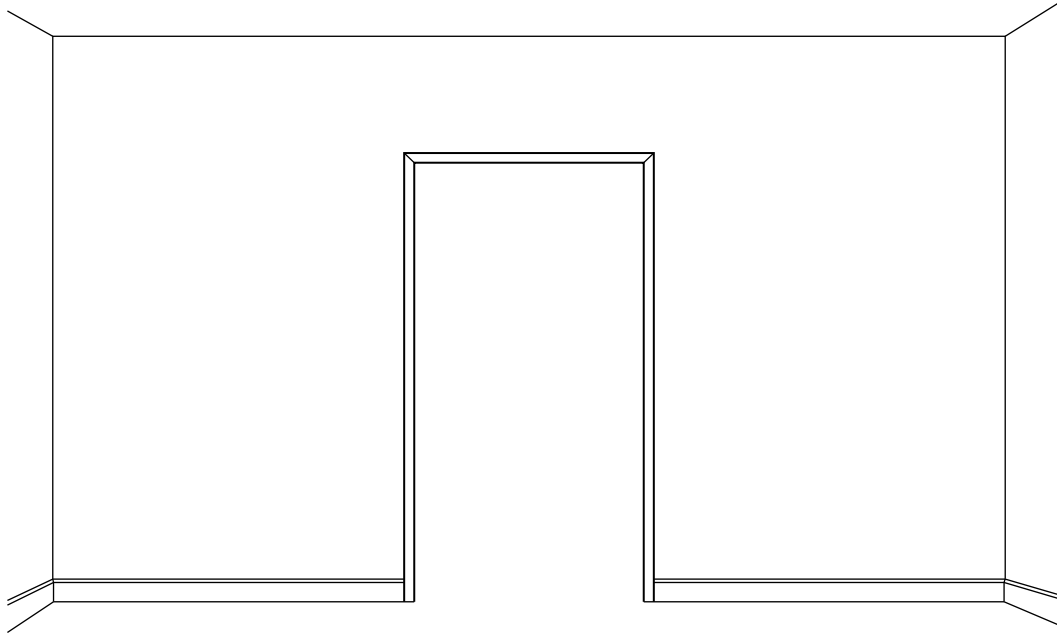


Fig. 1

(a) Give **four** justified design requirements for an internal non-load bearing partition wall of the type shown in Fig. 1.

1

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[4]

(b) Describe **two** examples where anthropometric data could be used in the design of a building. Use sketches and/or notes where appropriate.

1

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[4]

(c) Explain **two** ways in which the Sale of Goods Act protects consumers.

1

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(d) Explain in detail **one** of the following energy production systems and its benefit to society.

Geothermal

Biomass

Wave

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(e) (i) State a **suitable specific material** for the construction of the internal non-load bearing partition wall as shown in Fig. 1.
Give **two** properties or characteristics that make the material suitable for this use.

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- (ii) Describe, in detail, the method of constructing the internal non-load bearing partition wall shown in Fig. 1. Give details of how to make sure it is stable. Use annotated diagrams to support your answer.

2 Engineering

Fig. 2 shows a bench made from a plastic.

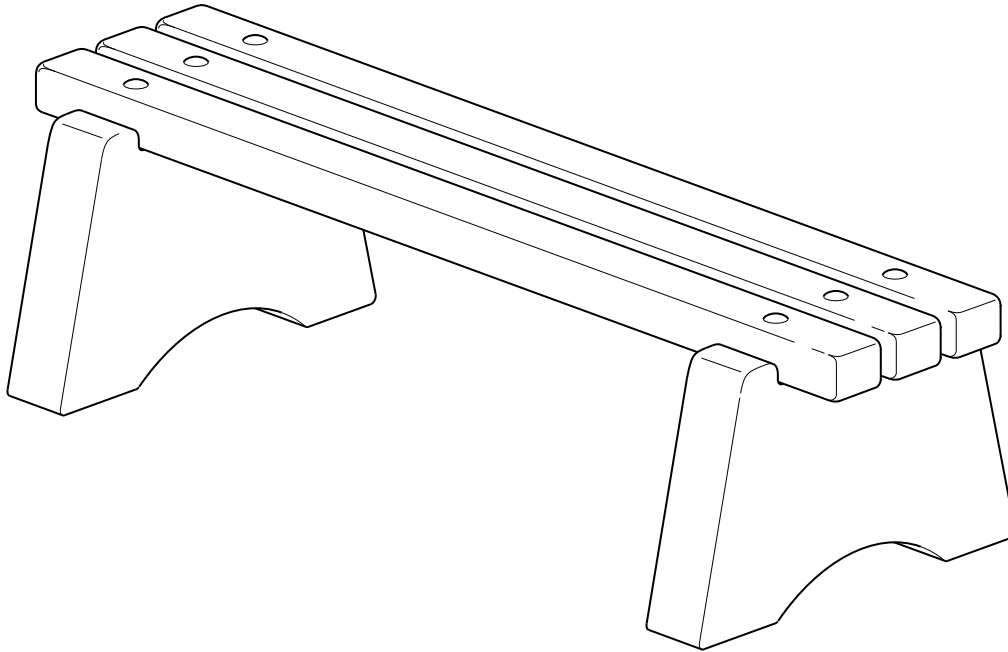


Fig. 2

(a) Give **four** justified design requirements for a bench of the type shown in Fig. 2.

- 1
 - 2
 - 3
 - 4
- [4]

(b) Describe **two** examples where anthropometric data could be used in the design of the bench shown in Fig. 2.
Use sketches and/or notes where appropriate.

1

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[4]

(c) Explain **two** ways in which the Sale of Goods Act protects consumers.

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(d) Explain in detail **one** of the following energy production systems and its benefit to society.

Geothermal

Biomass

Wave

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(e) Fig. 3 shows details of one of the seat rails from the bench.

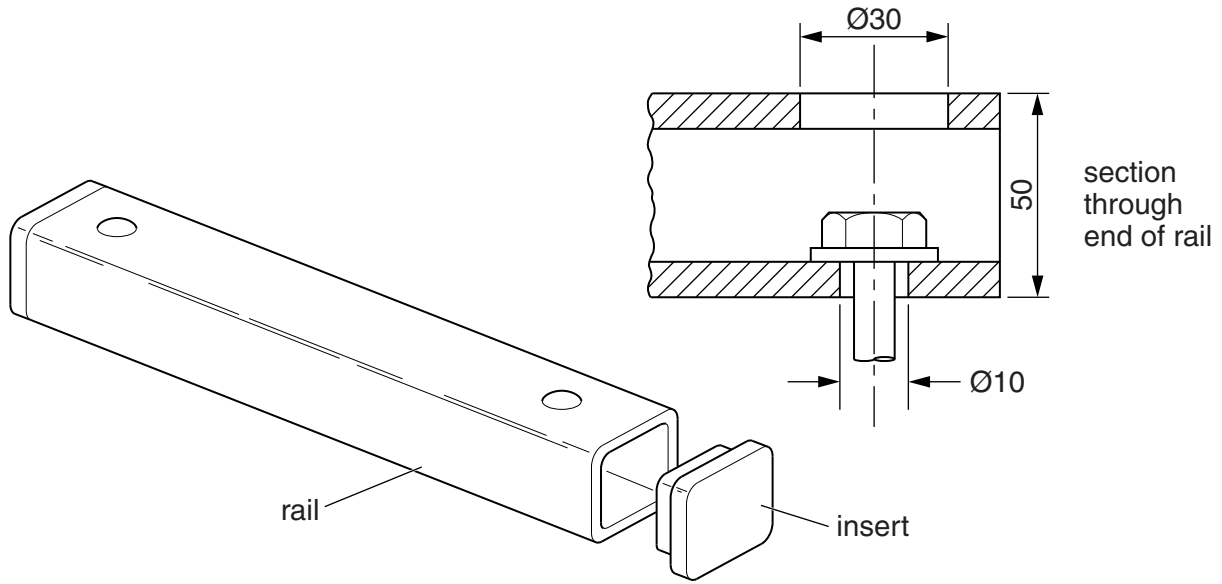


Fig. 3

- (i) State a **suitable specific plastic** for the seat rail shown in Fig. 3.
Give **two** properties or characteristics that make the material suitable for this use.

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..... [3]

- (ii) Describe, in detail, how the seat rail shown in Fig. 3 would be manufactured as a batch of 5000.
Give details of any special tooling and quality control checks that would be used.
Do not include details of the insert.
Use a flow chart and/or annotated diagrams to support your answer.

3 Food

Fig. 4 shows a milk carton.

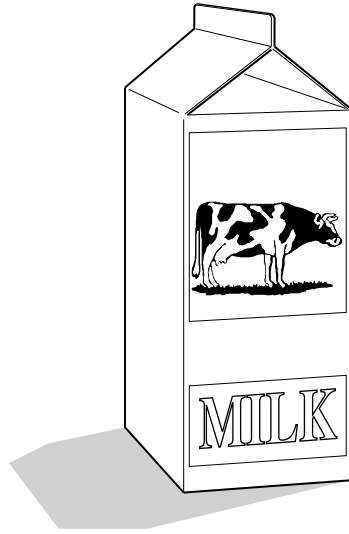


Fig. 4

(a) Give **four** justified design requirements for a milk carton of the type shown in Fig. 4.

- 1
 - 2
 - 3
 - 4
- [4]

(b) Describe **two** examples where anthropometric data would have been used in the design of the milk carton shown in Fig. 4.
Use sketches and/or notes where appropriate.

1

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[4]

(c) Explain **two** ways in which the Sale of Goods Act protects consumers.

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(d) Explain in detail **one** of the following energy production systems and its benefit to society.

Geothermal

Biomass

Wave

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(e) (i) Milk is an essential part of our diet and is a good source of protein.
State **one other** nutrient that milk provides and give **two** functions of this nutrient in the diet.

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- (ii) Describe in detail the differences between the processing methods and effects of the pasteurisation and sterilisation of milk.
Use a table or chart to support your answer.

4 Graphic Products

Fig. 5a shows a perfume box with a high gloss finish and an embossed logo. Fig. 5b shows a perfume bottle.

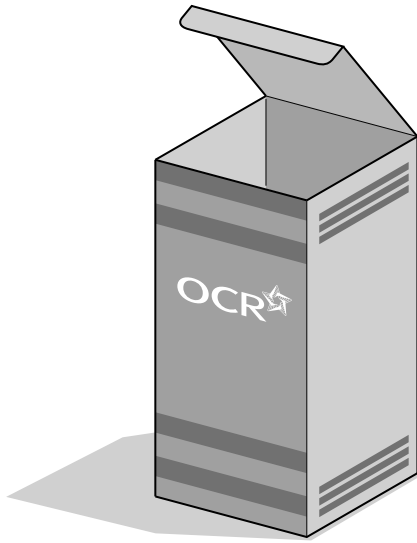


Fig. 5a



Fig. 5b

(a) Give **four** justified design requirements for a perfume box of the type shown in Fig. 5a.

- 1
 - 2
 - 3
 - 4
- [4]

(b) Describe **two** examples where anthropometric data would have been used in the design of the perfume bottle shown in Fig. 5b.
Use sketches and/or notes where appropriate.

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(c) Explain **two** ways in which the Sale of Goods Act protects consumers.

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(d) Explain in detail **one** of the following energy production systems and its benefit to society.

Geothermal

Biomass

Wave

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(e) (i) State a **suitable specific material** for the perfume box shown in Fig. 5a.
Give **two** properties or characteristics that make the material suitable for this use.

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- (ii) Describe, in detail, how the embossed logo and high gloss finish are applied to the perfume box shown in Fig. 5a.
It would be manufactured as a batch of 500.
Do not include details of cutting.

Use a flow chart and/or annotated diagrams to support your answer.

5 Manufacturing

Fig. 6 shows a ladder manufactured for household use.

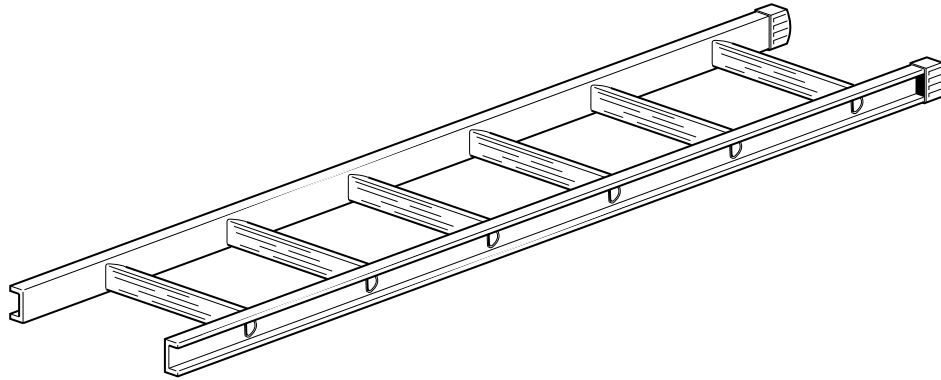


Fig. 6

(a) Give **four** justified design requirements for a ladder of the type shown in Fig. 6.

- 1
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 - 3
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- [4]

(b) Describe **two** examples where anthropometric data would have been used in the design of the ladder shown in Fig. 6.
Use sketches and/or notes where appropriate.

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[4]

(c) Explain **two** ways in which the Sale of Goods Act protects consumers.

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(d) Explain in detail **one** of the following energy production systems and its benefit to society.

Geothermal

Biomass

Wave

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(e) Fig. 7 shows one of the side sections of the ladder.

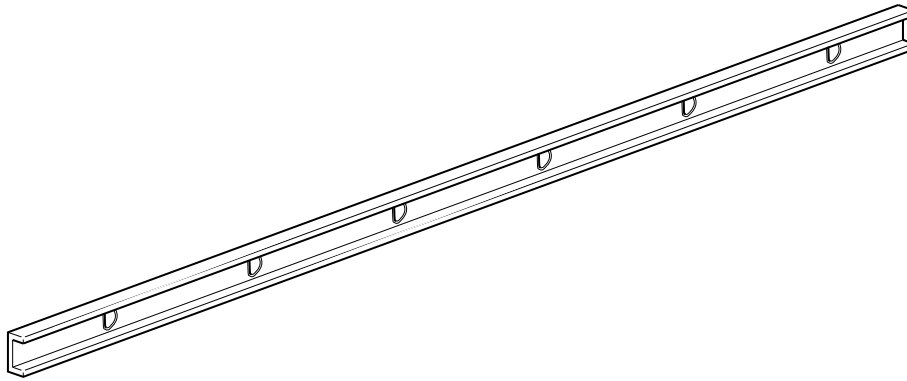


Fig. 7

(i) State a **suitable specific material** for the ladder section shown in Fig. 7.
Give **two** properties or characteristics that make the material suitable for this use.

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- (ii) Describe, in detail, how the ladder section shown in Fig. 7 would be manufactured as a batch of 1000.
Give details of any special tooling and quality control checks that would be used.
Use a flow chart and/or annotated diagrams to support your answer.

6 Resistant materials

Fig. 8 shows a tray to catch spills from a drinks dispenser.

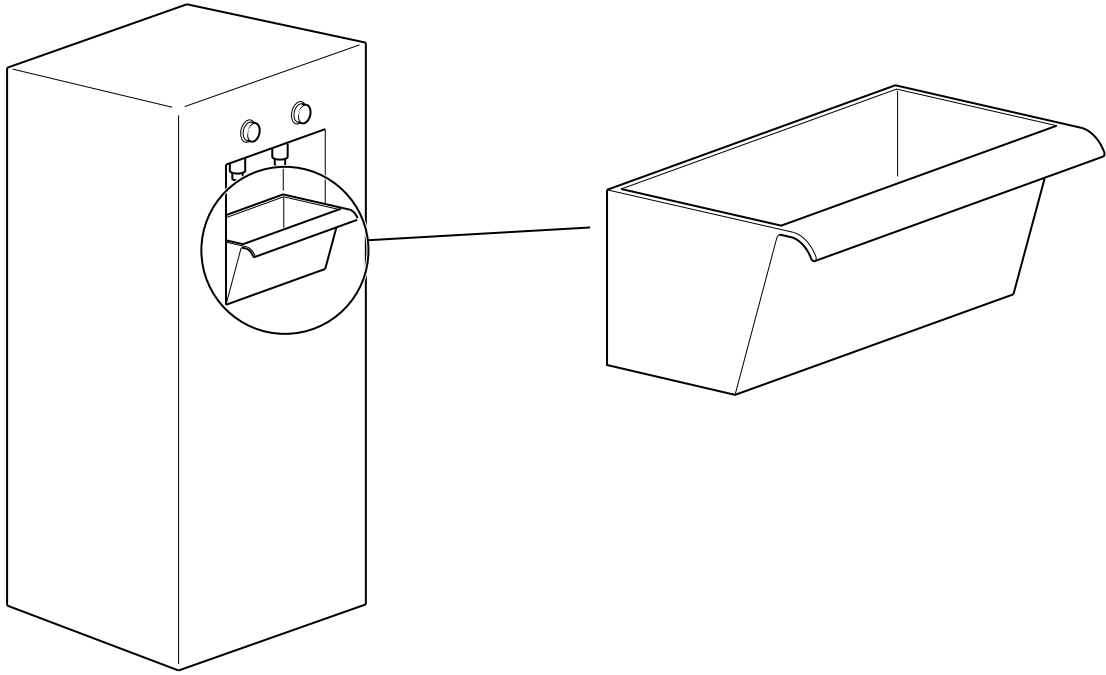


Fig. 8

(a) Give **four** justified design requirements for the tray shown in Fig. 8.

- 1
 - 2
 - 3
 - 4
- [4]

(b) Describe **two** examples where anthropometric data would have been used in the design of the tray shown in Fig. 8.
Use sketches and/or notes where appropriate.

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(c) Explain **two** ways in which the Sale of Goods Act protects consumers.

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- (ii) Describe, in detail, how the tray shown in Fig. 8 would be manufactured as a batch of 250.
Include details of any jigs and/or formers used.
Use a flow chart and/or annotated diagrams to support your answer.

- (f) More and more new and smart materials are available. Discuss what this means for the designer.

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Question 6 Total [36]

7 Systems and Control

Fig. 9 shows a cordless screwdriver.



Fig. 9

(a) Give **four** justified design requirements for a cordless screwdriver of the type shown in Fig. 9.

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4 [4]

(b) Describe **two** examples where anthropometric data would have been used in the design of the cordless screwdriver shown in Fig. 9.
Use sketches and/or notes where appropriate.

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[4]

(c) Explain **two** ways in which the Sale of Goods Act protects consumers.

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(d) Explain in detail **one** of the following energy production systems and its benefit to society.

Geothermal

Biomass

Wave

..... [4]

(e) (i) State a **suitable specific type of battery** for use in the cordless screwdriver shown in Fig. 9.
Give **two** properties or characteristics that make the battery suitable for this use.

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- (ii) Draw an annotated diagram of a suitable gear system for the cordless screwdriver shown in Fig. 9, to reduce the speed of the motor from 6000rpm to an output speed of 250rpm.

8 Textiles

Fig. 10 shows a neck tie.



Fig. 10

(a) Give **four** justified design requirements for the neck tie of the type shown in Fig. 10.

- 1
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 - 3
 - 4
- [4]

(b) Describe **two** examples where anthropometric data would have been used in the design of the tie in Fig. 10.
Use sketches and/or notes where appropriate.

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[4]

(c) Explain **two** ways in which the Sale of Goods Act protects consumers.

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(d) Explain in detail **one** of the following energy production systems and its benefits to society.

Geothermal

Biomass

Wave

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(e) (i) State a **suitable specific fibre** for a neck tie of the type shown in Fig. 10.
 Give **two** performance characteristics that make the fibre suitable for this use.

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- (ii) Describe, in detail, how the neck tie shown in Fig. 10 would be manufactured as a batch of 250.
Give full details of all pattern pieces.
Use a flow chart and/or annotated diagrams to support your answer.

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