



**Tuesday 3 June 2014 – Morning**

**A2 GCE DESIGN AND TECHNOLOGY**

**F524/01** Product Design: Component 1

Candidates answer on the Question Paper.

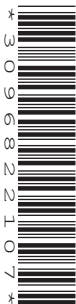
**OCR supplied materials:**

None

**Other materials required:**

- A calculator may be used

**Duration: 1 hour**



Candidate forename		Candidate surname	
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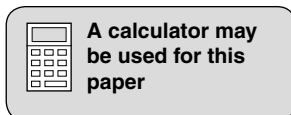
Centre number						Candidate number				
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**INSTRUCTIONS TO CANDIDATES**

- 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 **48** pages. Any blank pages are indicated.



1 Built Environment and Construction

Fig. 1 shows a flat roof structure.

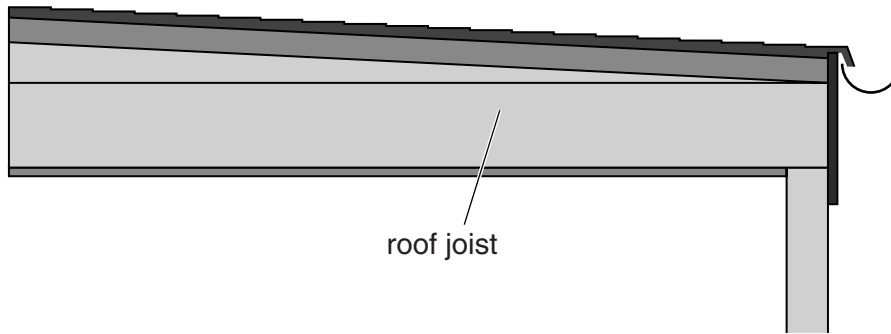


Fig. 1

(a) Give **four** justified design requirements for a flat roof structure of the type shown in Fig. 1.

- 1 .....
- 2 .....
- 3 .....
- 4 .....

[4]

(b) Give **two** benefits of using computerised stock control in modern industry.

- 1 .....
- 2 .....

[4]

(c) Describe **two** key features of the COSHH Regulations.

1 .....

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2 .....

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[4]

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

circle your chosen topic.

- Solar photovoltaic
- Hydro-electric
- Tidal

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[4]

- (e) (i) State a **suitable specific material** for the flat roof joists shown in Fig. 1.  
Give **two** properties or characteristics that make the material suitable for this use.

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..... [3]

- (ii) Describe in detail how fall can be provided to take rainwater off a flat roof. Use annotated diagrams to support your answer.



2 Engineering

Fig. 2 shows a metal bench used in a public space.

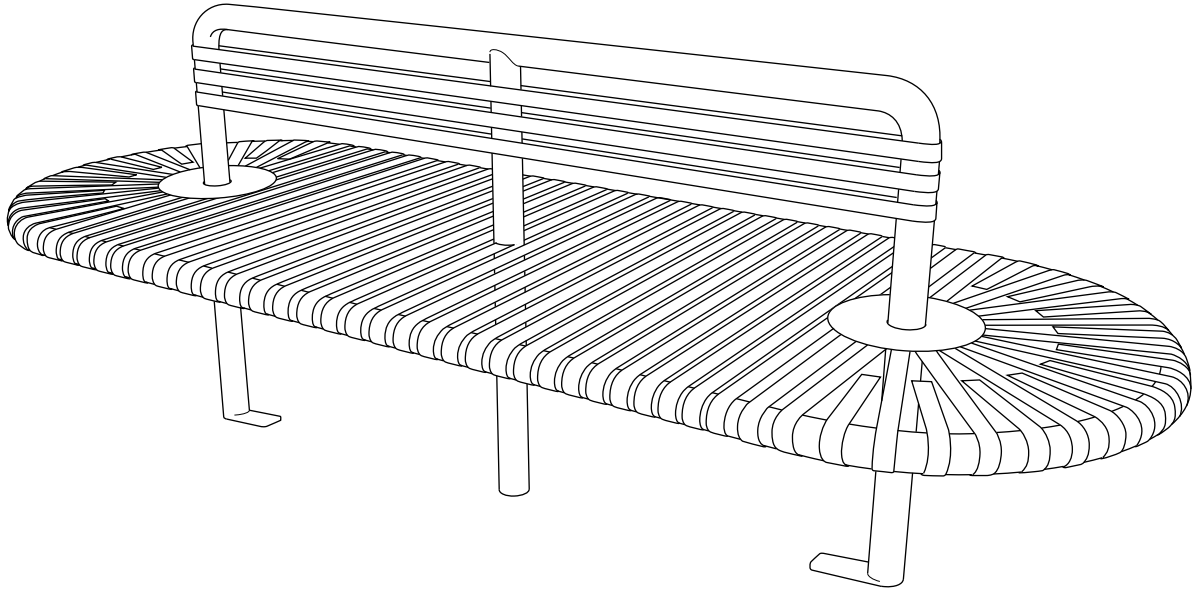


Fig. 2

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

- 1 .....
- 2 .....
- 3 .....
- 4 .....

[4]

(b) Give **two** benefits of using computerised stock control in modern industry.

1 .....

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2 .....

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[4]

(c) Describe **two** key features of the COSHH Regulations.

1 .....

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2 .....

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[4]





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

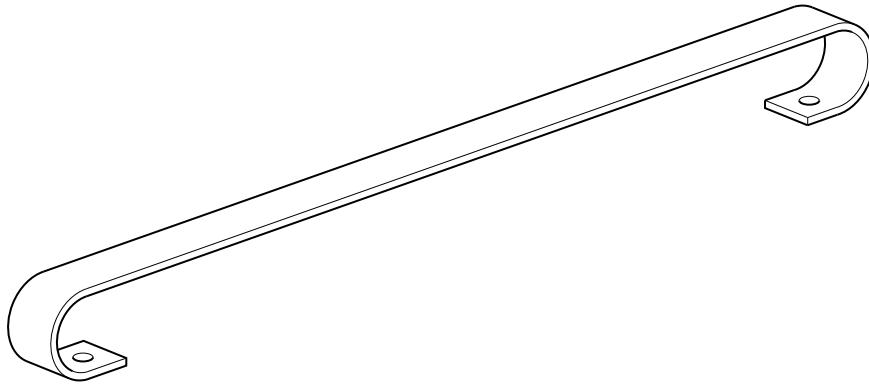


Fig. 3

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

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- (ii) Describe in detail how the seat rail shown in Fig. 3 would be manufactured as a **batch of 5,000**.

Give details of any specialist tooling and quality control checks that would be used.  
Use a flow chart and/or annotated diagrams to support your answer.

[9]



3 Food

Fig. 4 shows a frozen ready to cook meal of salmon in flaky/rough puff pastry.

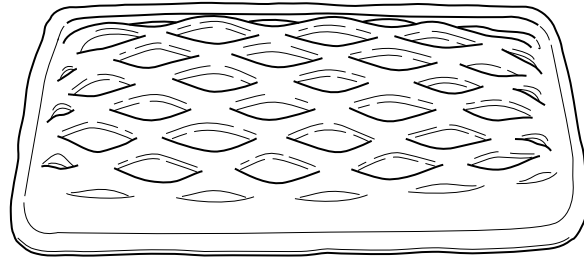


Fig. 4

(a) Give **four** justified design requirements for the ready to cook meal of the type shown in Fig. 4.

- 1 .....
- 2 .....
- 3 .....
- 4 .....

[4]

(b) Give **two** benefits of using computerised stock control in modern industry.

1 .....

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2 .....

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[4]

(c) Describe **two** key features of the COSHH Regulations.

1 .....

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2 .....

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[4]



(e) (i) State **three** reasons why we are encouraged to include fish in our diet

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- (ii) Describe in detail how to manufacture flaky/rough puff pastry for the ready to cook meal shown in Fig. 4.

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



4 Graphic Products

Fig. 5 shows a point of sale display stand.

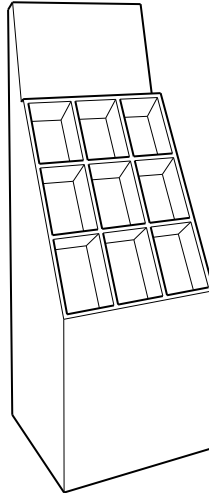


Fig. 5

(a) Give **four** justified design requirements for a point of sale display stand of the type shown in Fig. 5.

- 1 .....
- 2 .....
- 3 .....
- 4 .....

[4]

(b) Give **two** benefits of using computerised stock control in modern industry.

1 .....

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2 .....

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[4]

(c) Describe **two** key features of the COSHH Regulations.

1 .....

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2 .....

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[4]



- (e) (i) State a **suitable specific material** for the point of sale display stand shown in Fig. 5. Give **two** properties or characteristics that make the material suitable for this use.

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- (ii) Describe in detail how the point of sale display stand would be manufactured as a **batch of 1500**.

Include details of any jigs and/or formers used.

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





5 Manufacturing

Fig. 6 shows a plastic ride-on toy for a small child.

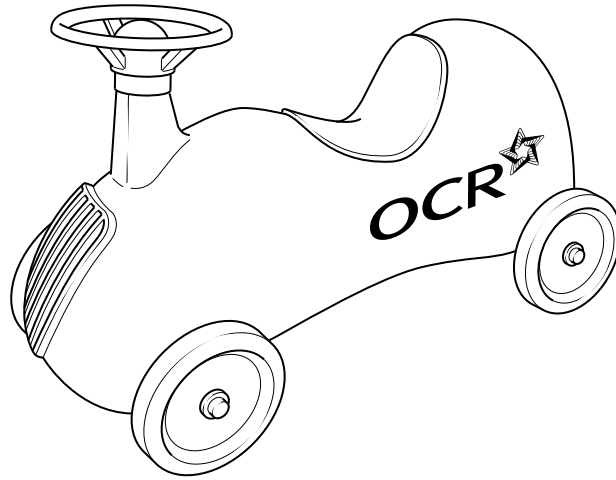


Fig. 6

(a) Give **four** justified design requirements for a plastic ride-on toy of the type shown in Fig. 6.

- 1 .....
- 2 .....
- 3 .....
- 4 .....

[4]

(b) Give **two** benefits of using computerised stock control in modern industry.

1 .....

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2 .....

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[4]

(c) Describe **two** key features of the COSHH Regulations.

1 .....

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[4]



(e) Fig. 7 shows the hollow body shell of the plastic ride-on toy shown in Fig. 6.

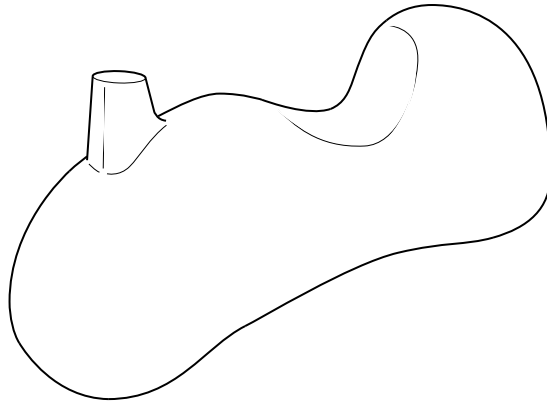


Fig. 7

- (i) State a **suitable specific plastic** for the hollow body shell 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 hollow plastic body shell shown in Fig. 7 would be manufactured in one piece as a **batch of 1,000**.  
Give details of any specialist 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 child's tricycle.

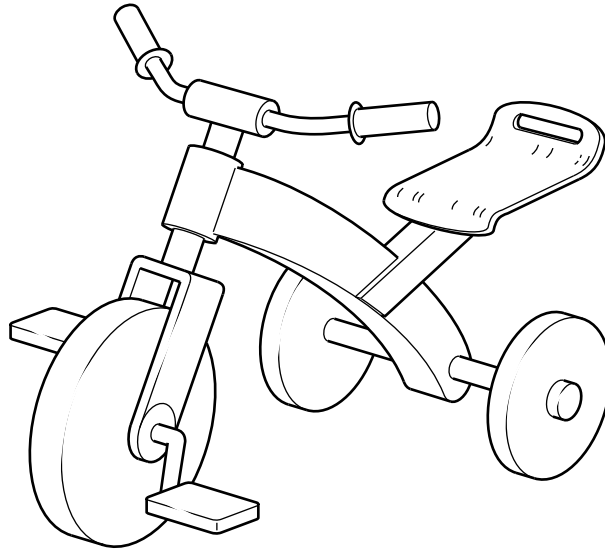


Fig. 8

(a) Give **four** justified design requirements for a child's tricycle of the type shown in Fig. 8.

- 1 .....
- 2 .....
- 3 .....
- 4 .....

[4]

(b) Give **two** benefits of using computerised stock control in industry.

1 .....

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2 .....

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[4]

(c) Describe **two** key features of the COSHH Regulations.

1 .....

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2 .....

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[4]







- (ii) Describe in detail how the part you have chosen would be manufactured as a **batch of 50**.

Include details of any jigs and/or formers used.

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

[9]



7 Systems and Control

Fig. 10 shows an electric kettle.

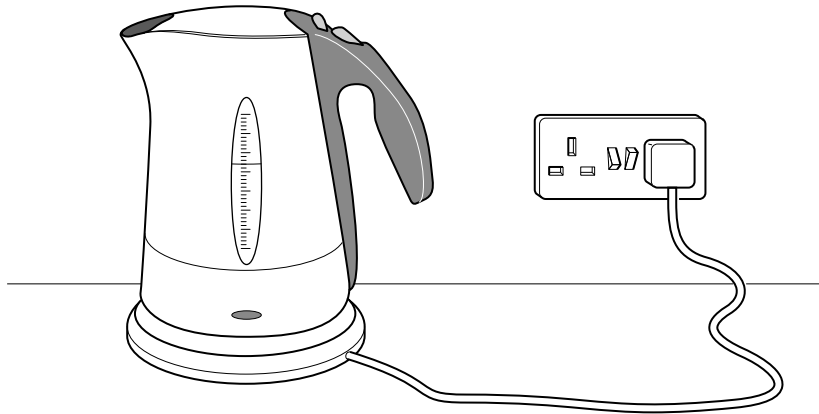


Fig. 10

(a) Give **four** justified design requirements for an electric kettle of the type shown in Fig. 10.

- 1 .....
- 2 .....
- 3 .....
- 4 .....

[4]

(b) Give **two** benefits of using computerised stock control in industry.

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2 .....

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[4]

(c) Describe **two** key features of the COSHH regulations.

1 .....

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[4]



- (e) (i) State a sensor which could be used in an electric kettle to measure the temperature of the water and draw a circuit to show how the sensor is used to produce a voltage signal which changes with temperature.

**Sensor** .....

[3]



- (ii) Draw a full circuit diagram to show how the signal from the sensor you identified in part **e(i)** could be used to switch off the kettle when the water reaches boiling point. Explain the operation of the circuit.

[9]



8 Textiles

Fig. 11 shows a pair of children’s pyjamas suitable to be worn in winter.

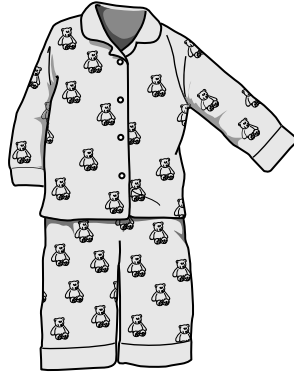


Fig. 11

(a) Give **four** justified design requirements for pyjamas of the type shown in Fig. 11.

- 1 .....
- 2 .....
- 3 .....
- 4 .....

[4]

(b) Give **two** benefits of using computerised stock control in modern industry.

1 .....

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[4]

(c) Describe **two** key features of the COSHH Regulations.

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[4]



- (e) (i) State a **suitable specific fabric** for the pyjamas shown in Fig. 11.  
Give **two** properties or characteristics that make the fabric suitable for this use.

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- (ii) The design on the fabric for the pyjamas has been transfer printed. Describe in detail how the fabric for the pyjamas would be printed to produce a **batch of 1500** pairs of pyjamas. Use a flow chart and/or annotated diagrams to support your answer.

[9]

