



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:

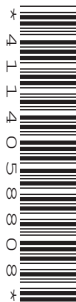
None

Other materials required:

- A calculator may be used

Duration: 1 hour

MODIFIED LANGUAGE



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.



**A calculator may
be used for this
paper**

1 Built Environment and Construction

Fig. 1 shows a flat roof structure.

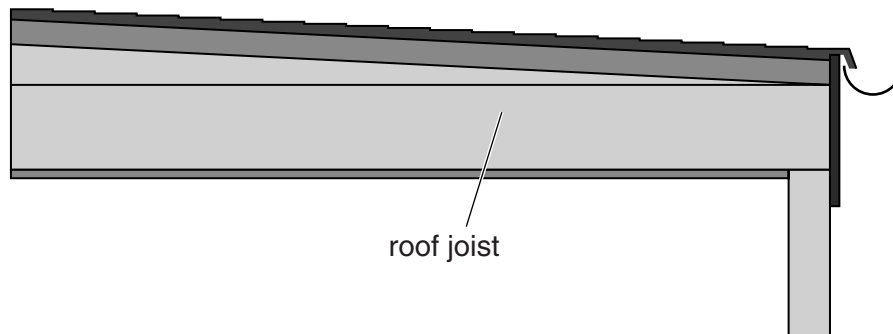


Fig. 1

(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.

(f) Discuss the impact of modern media on the advertising of products.

..... [8]

2 Engineering

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

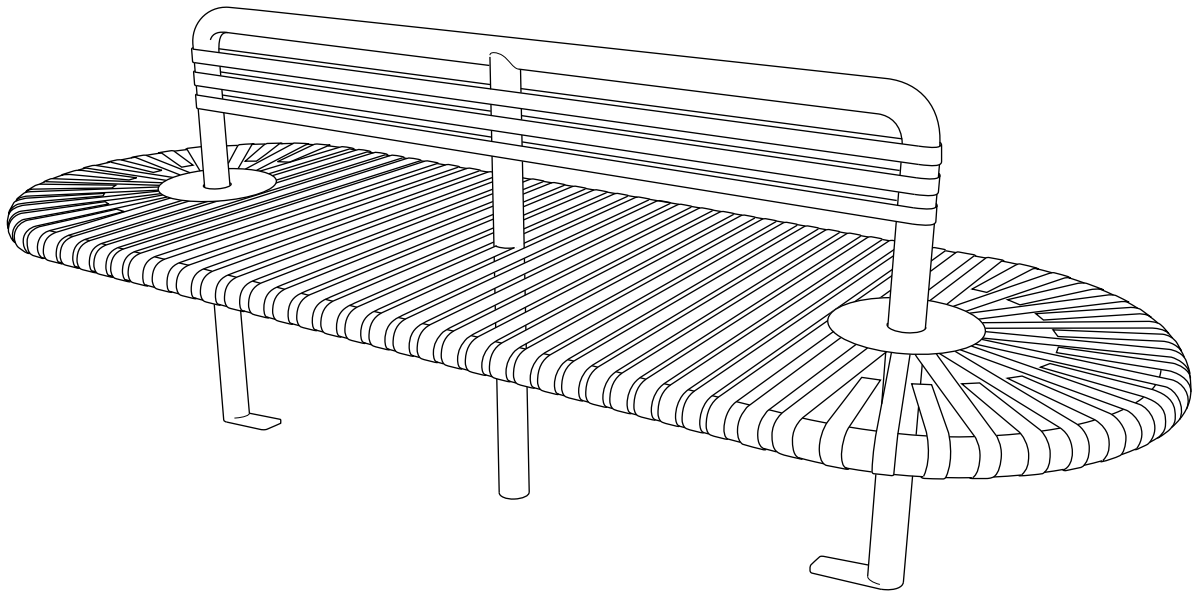


Fig. 2

(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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[4]

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

1

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

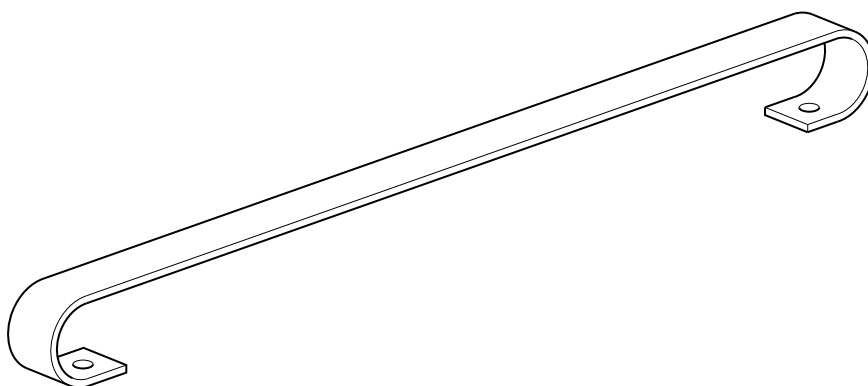


Fig. 3

- (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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..... [3]

- (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.

(f) Discuss the impact of modern media on the advertising of products.

[8]

3 Food

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

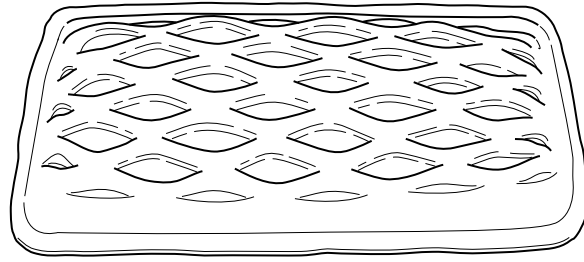


Fig. 4

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

- 1
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- 2
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- 3
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- 4
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[4]

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

- 1
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-
- 2
-
-

[4]

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

- 1
-
-
- 2
-
-

[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 **three** reasons why we are encouraged to include fish in our diet

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..... [3]

- (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.

(f) Discuss the impact of modern media on the advertising of products.

[8]

4 Graphic Products

Fig. 5 shows a point of sale display stand.

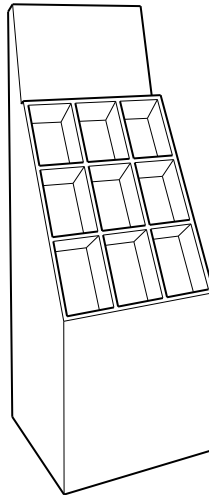


Fig. 5

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

1

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2

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3

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4

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[4]

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

- 1
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-
- 2
-
-

[4]

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

- 1
-
-
- 2
-
-

[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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- (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.

(f) Discuss the impact of modern media on the advertising of products.

[8]

5 Manufacturing

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

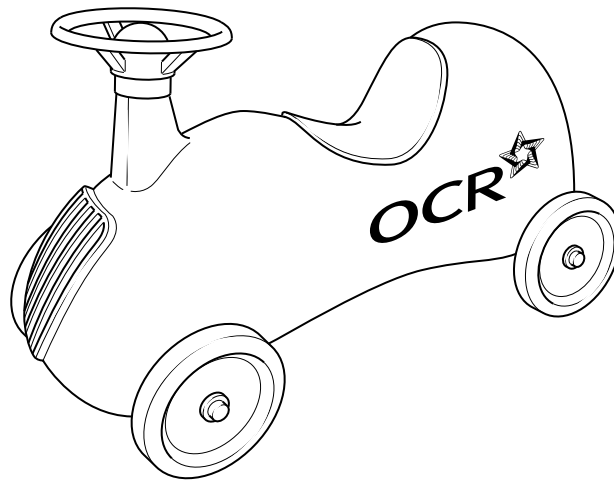


Fig. 6

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

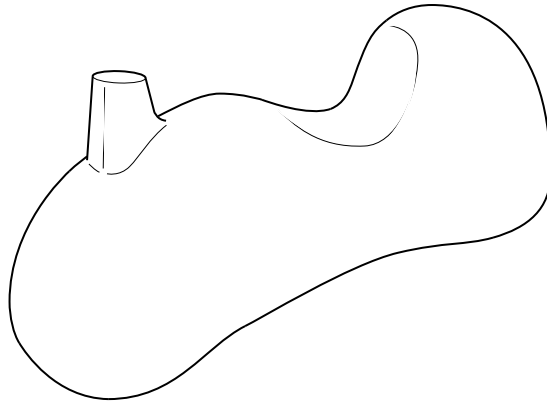


Fig. 7

- (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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..... [3]

- (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.

(f) Discuss the impact of modern media on the advertising of products.

[8]

6 Resistant materials

Fig. 8 shows a child's tricycle.

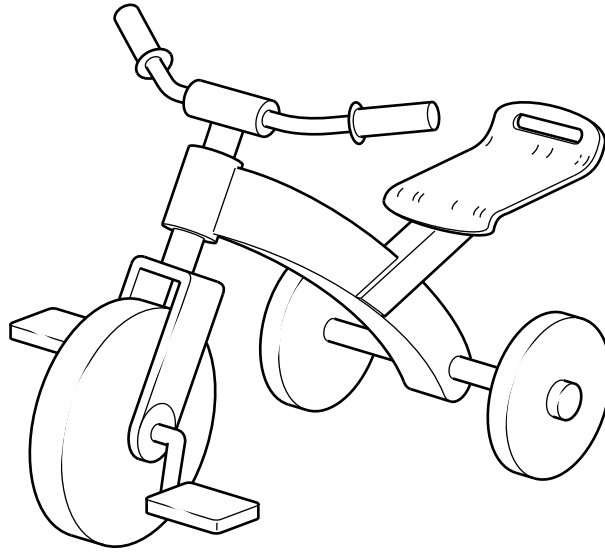


Fig. 8

(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]

- (d) Describe in detail **one** of the following energy production systems and describe one benefit to society of your chosen system.

circle your chosen topic.

Solar photovoltaic

Hydro-electric

Tidal

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(e) Fig. 9 shows parts of the child's tricycle.

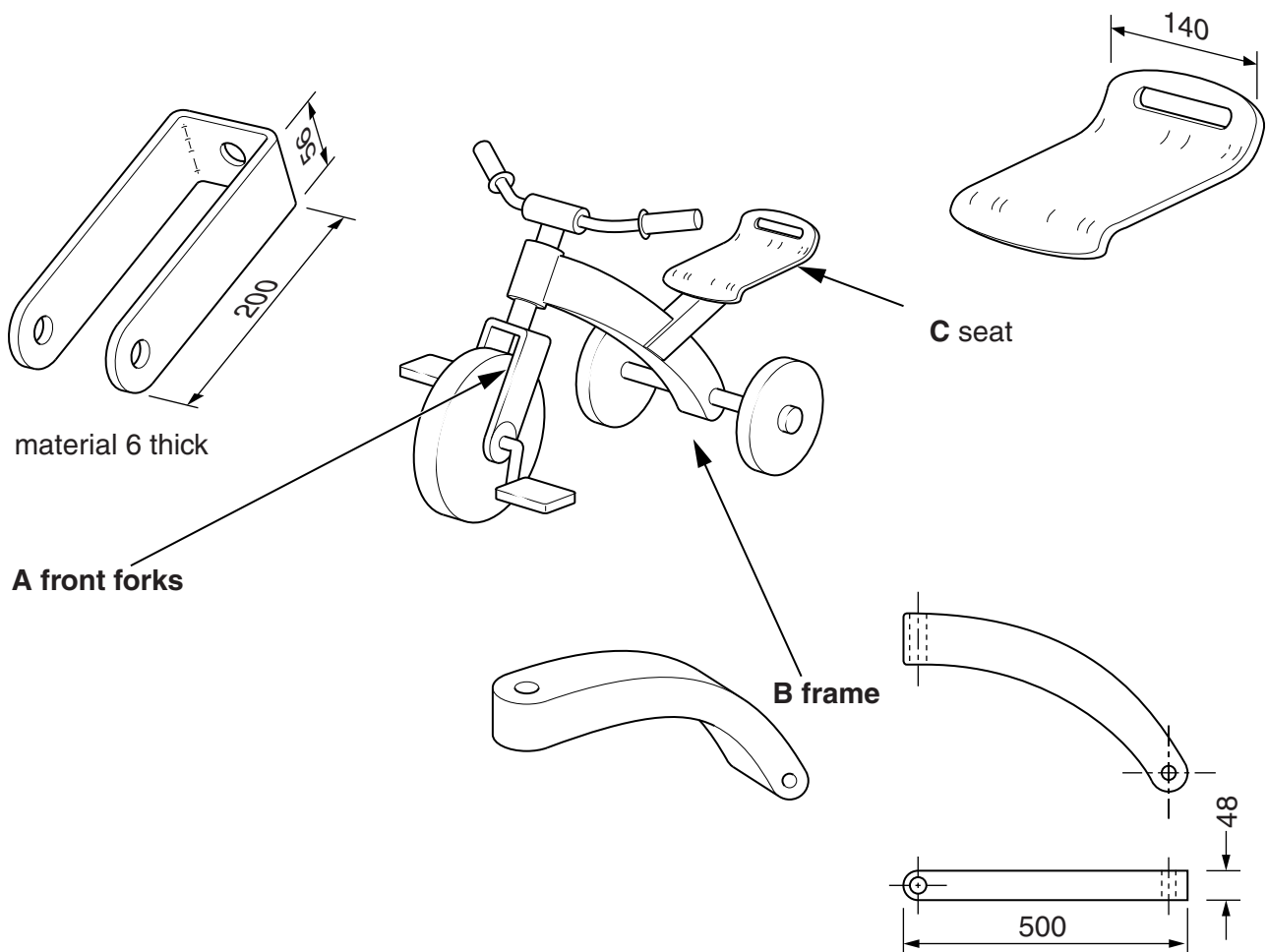


Fig. 9

Choose **one** of the parts A, B or C shown in Fig. 9.

Chosen part

- (i) State a **suitable specific material** for the part that you have chosen.
Give **two** properties or characteristics that make the material suitable for this use.

[3]

- (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.

(f) Discuss the impact of modern media on the advertising of products.

[8]

7 Systems and Control

Fig. 10 shows an electric kettle.

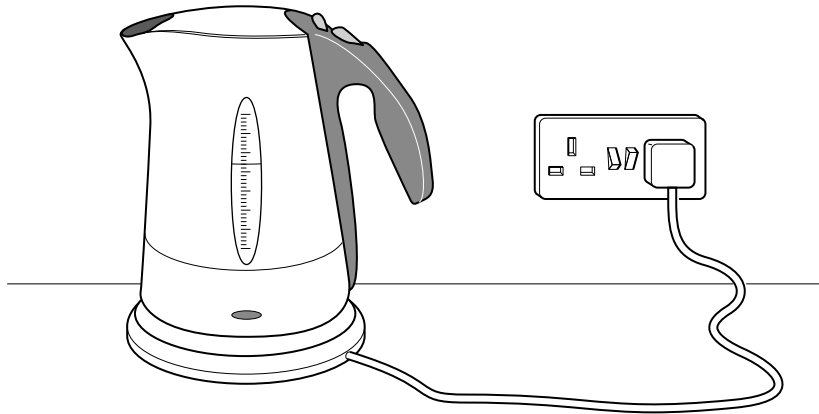


Fig. 10

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

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- 2
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- 3
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- 4
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[4]

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

1

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[4]

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

1

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[4]

- (d) Describe in detail **one** of the following energy production systems and describe **one** benefit to society of your chosen system.

circle your chosen topic.

Solar photovoltaic

Hydro-electric

Tidal

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- (e) (i) State a sensor which could be used in an electric kettle to measure the temperature of the water. 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.

(f) Discuss the impact of modern media on the advertising of products.

[8]

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.

1

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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 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.

..... [8]

[8]



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