SAMPLE PRODUCT DESIGN GCSE EXAMINATION PAPER

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

SAMPLE PAPER1

SURNAME _____

FORENAME(S) _____

CANDIDATE SIGNITURE _____

2 HOURS ALLOWED

Materials required for this examination:

- normal writing and drawing instruments
- a calculator
- a protractor.

Instructions to candidates:

- Use black ink or black ball-point pen. Use pencil only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 128.
- The question in Section A relates to the context referred to in the Preliminary Material that was previously issued.
- All dimensions are given in millimetres unless otherwise stated.
- You are reminded of the need for good English and clear presentation in your answers.

SECTION A

This question is about designing.

You are advised to spend about 30 minutes on this question.
People take part in a range of leisure activities. Food and drink is required for lunch time and there is a need for a suitable carrier.

LEISURE ACTIVITES






1a. A product analysis for designing a food carrier involves, investigating a range of points.
Complete the diagram below.
One of the points has been completed for you. **3 X 2 marks**

ENVIRONMENTAL FACTORS

_____

_____

_____

MATERIALS

CORRUGATED CARD

POLYETHYLENE

POLYVINYLCHLORIDE

PRODUCT ANALYSIS

FUNCTIONS AND FEATURES

_____

_____

_____

AESTHETICS/STYLE

_____

_____

_____

SECTION A

This question is about designing.

You are advised to spend about 30 minutes on this question.
People take part in a range of leisure activities. These activities can last a considerable amount of time and food and drink is required for lunch time.

LEISURE ACTIVITES






1a. A product analysis for designing a food carrier involves, investigating a range of points.
Complete the diagram below.
One of the points has been completed for you. **3 X 2 marks**

ENVIRONMENTAL FACTORS

Must be recyclable.
Made from sustainable materials.
Have recycling symbols on its surface.
Manufactured from environmentally friendly materials such as card / polylactide.

MATERIALS

CORRUGATED CARD

POLYETHYLENE

POLYVINYLCHLORIDE

PRODUCT ANALYSIS

FUNCTIONS AND FEATURES

Must keep the food fresh.
Must protect the food from knocks and drops.
Has a re-sealable lid.
Have a company logo and associated information on the container.
Promotes healthy eating and environmental awareness. Should be easy to carry.

AESTHETICS/STYLE

Should be modern and stylish.
Should be imaginative and different to existing designs.
Manufactured in a range of colours.
Eye catching and create a desire to own.
Allow personalisation on the front.

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/prddes_2/carrier20.html

1b. You are to design a <u>REUSABLE</u> food carrier to contain and protect its contents. The carrier will be used by people who enjoy participating in leisure activities and need to carry a meal / lunch with them.

In the space below, use notes and sketches to design a suitable food carrier for leisure activities.

Marks will be given for:
- an original outcome
- details regarding the use of materials and the techniques and processes required for its manufacture.
- health and safety considerations and functionality.
- the level of communication and presentation.

15 marks

1-2 marks - just a sketch or just notes of a basic nature.

3-7 marks - basic answer with some notes and basic sketch.

8 - 15 - award according to clarity and detail of both notes and sketches.

1c. Evaluate your design and its suitability as a food carry, for people taking part in leisure activities. ***4 marks***

1-2 marks - basic answer with some relevant points included.

3-4 marks for appropriate detail

See next page for sample answer / appropriate points.

1d. Your product is to be manufactured through batch production. What is batch production and why is it suitable for your product? ***4 marks***

TO HELP YOU ANSWER THIS QUESTION	http://www.technologystudent.com/joints/scalep1.htm http://www.technologystudent.com/joints/rev_batch1.html

Follow the links for detailed answers / points to be included.

1 - 2 marks for basic answer

3-4 marks for level of detail.

Pupils should refer to the process of manufacture as being suitable for batch production.

1c.

Keeping the contents fresh. POSSIBLE ANSWERS

The contents of the container will remain fresh, because of the choice of material polypropylene and that way it has been used. Polypropylene is flexible which means that the lid stretches over the casing, creating a very good seal, keeping the food as fresh as possible.

Transportation of the contents.

The container is easy to transport. It is small and light and consequently easy to carry or pack in a school bag. It has a handy carrying handle, that has been ergonomically designed to fit a child's hand comfortably.

Protects the contents.

The food contents of the container are quite well protected. The container absorbs drops and knocks, because this is one physical property of polypropylene. However, if the container is shaken the food can move around and may be displaced. This is minimised due to the internal divide. Polypropylene is a hygienic material and washes well.

Aesthetically pleasing.

The container is designed to appeal to young children. It is a symmetrical shape and well balanced. The heart shape promotes the image of healthy eating and is a recognisable shape. The container comes in a range of colours, appealing to a wide base of potential customers.

Easy to manufacture

Polypropylene is suitable for blow moulding and consequently large number of containers can be made relatively quickly. The moulded polypropylene container may need triming by hand, to remove rough edges and excess material. However, this is a relatively simple task.

TO HELP YOU ANSWER THIS QUESTION	http://www.technologystudent.com/joints/oiltoplas1.html http://www.technologystudent.com/designpro/plastic2.html

1e. Describe the life cycle of your product? ***4 marks***

Can include notes and a sketch or either.

1-2 marks for basic answer but must describe a cycle form start to back to the beginning
3 -4 marks more detail describing every stage of the cycle.

Could include - at the end of the products life that polypropylene (PP) can be deposited at a recycling bank and recycled so that it can e reused to manufacture new products.

Section B

Answer **all** questions in the spaces provided.

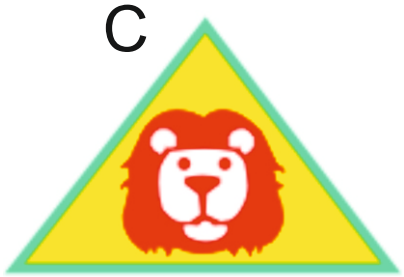
This question is focussed on materials and also symbols.

TO HELP YOU ANSWER THIS QUESTION	http://www.technologystudent.com/despro2/drink7.htm

2a. Three packaging symbols are seen below. Complete the table by adding the symbol letter to the correct description. ***3 marks***

A 

B 

C 

LETTER	DESCRIPTION
C	Displayed on a product it means that the manufacturer/retailer has agreed to the 'British Toy and Hobby Associations' Code of practice. It is a consumer symbol that represents the manufacturers promise to conform to all relevant safety information.
A	This means that the contents of the package has been produced in the Third World and that the producer (ie. the farmer) has received a fair and realistic price. subsidises.
CE	The product inside the package, has been tested to European safety standards. The symbol is normally applied to non-food products such as electronic products or toys. However, it may still be applied to the packaging, as a reference to the package itself being safe.

TO HELP YOU ANSWER THIS QUESTION

http://www.technologystudent.com/despro_flsh/laminate1.html

http://www.technologystudent.com/despro_flsh/laminate2.html

2b. The products shown below are manufactured from laminated card.

Write two reasons why this type of material is suitable for the products above. *2 marks*

REASON 1:

REASON 2:

For both reasons:

Follow link for full detail on answers.
Answers may include - cost, hygiene, protection of product.

1 mark per reason.

2c. The large clothes collection box is manufactured from corrugated polypropylene. Write two reasons why this material is suitable. *2 marks*

TO HELP YOU ANSWER THIS QUESTION

http://www.technologystudent.com/despro_flsh/charity13.html

REASON 1:

REASON 2:

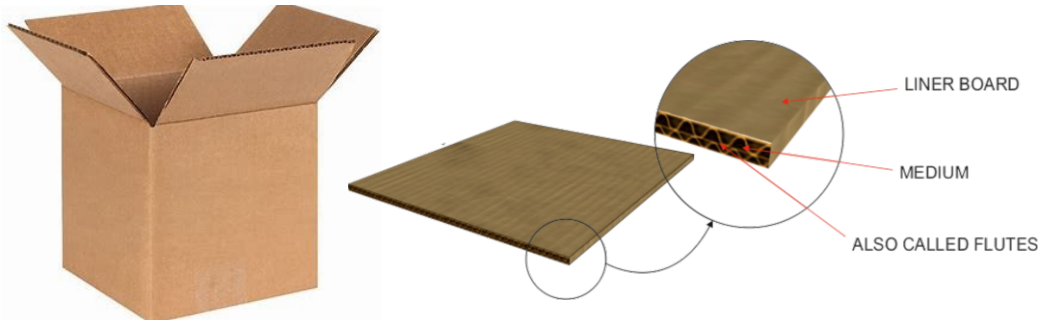
For both reasons:

Follow link for full detail on answers.
Answers may include - cost, hygiene, protection of product.

1 mark per reason.

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/despro2/crdpap2.htm

2d. The packaging box is manufactured from corrugated card. Write two reasons why this material is suitable. ***2 marks***



REASON 1:

For both reasons:

Follow link for full detail on answers.
Answers may include - cost, hygiene, protection of product.

REASON 2:

1 mark per reason.

TO HELP YOU ANSWER
2e and 2f

http://www.technologystudent.com/joints/aroma1.html

2e. What are aroma pigments and how do they work? Include a sketch in your answer. *3 marks*

1 mark for basic answer.

2 marks for basic answer with both sketch and notes

3 marks for full answer. Follow link for detail on aroma pigments.

2f. Give one example of the practical application of aroma pigments. Include a sketch in your answer. *3 marks*

1 mark for basic answer.

2 marks for basic answer with both sketch and notes

3 marks for full answer. Follow link for practical applications

3. This question is concerned with health and safety

3a. The kettle has been designed to be repaired when it eventually breaks down. *2 X 2 marks*

TO HELP YOU ANSWER THIS QUESTION
http://www.technologystudent.com/prddes1/repair1.html

List two advantages of a product that can be repaired, has over a product that cannot be repaired and must be replaced.

ADVANTAGE 1:

1 mark for simple / basic answer

2 marks for full answer

Follow link for sample answers.

ADVANTAGE 2:

TO HELP YOU ANSWER THIS QUESTION	http://www.technologystudent.com/prddes1/kettles4.html

3B. Identify one of the labelled parts of the kettle and describe one fault that can occur and how it can be a safety issue. *2 marks*

PART: _____

FAULT AND SAFETY ISSUE:

Part must be identified. Follow link for sample answers

For one mark - part is identified and fault explained but in a basic way.

For both marks - part is identified and fault explained in detail.

3C. A common hazard, it's risk level and associated controlled measure(s) are written in the table below. For your material area specialism, describe two hazards, their risk levels and control measures. Use the blank tables for your answers. *2 x 4 marks*

TO HELP YOU ANSWER THIS QUESTION	http://www.technologystudent.com/prddes1/healthandsaf1.html http://www.technologystudent.com/prddes1/helf2.html

HAZARD	RISK - LEVEL	CONTROL MEASURE(S)
Possibility of sharp, extremely hot steel 'swarf', flying at high speed in the direction of the operator.	***Medium level possibility, due to the physical properties of sheet steel.***	***Fit Guard. Ensure guard is in position. Goggles supplied. Foot stop for emergency. Staff training, so that drilling is controlled correctly by the operator and the risks are understood. Appropriate protective clothing provided.***

HAZARD - 1	RISK - LEVEL	CONTROL MEASURE(S)

HAZARD - 1	RISK - LEVEL	CONTROL MEASURE(S)

For any marks the hazard must be correctly identified.

1-2 marks for hazard and risk level

3-4 marks detail given to risk and control measure.

Use teacher discretion on this question / answers.

4. This question relates to environmental issues

4a. Explain each of the following environmental terms. *3 x 2 marks*

TO HELP YOU ANSWER THIS QUESTION	http://www.technologystudent.com/prddes1/lifecy1.html

Sustainability:

Follow the link for detailed answers. For any marks the phrase must be clearly understood.

1 mark for basic answer.

2 marks for full answer / detail.

TO HELP YOU ANSWER THIS QUESTION	http://www.technologystudent.com/prddes1/upcycling1.html

Upcycling:

Follow the link for detailed answers. For any marks the phrase must be clearly understood.

1 mark for basic answer.

2 marks for full answer / detail.

TO HELP YOU ANSWER THIS QUESTION	http://www.technologystudent.com/prddes1/susenv1.html http://www.technologystudent.com/joints/sustain1.html

Sustainability:

Follow the link for detailed answers. For any marks the phrase must be clearly understood.

1 mark for basic answer.

2 marks for full answer / detail.

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/prddes1/ict1.html

4b. Marketing/advertising, through the use ICT (Information Communication Technology), helps to promote new products.

Describe how ICT is used to promote new products to potential customers.
4 marks

Follow the link for detailed answers.

1 - 2 marks - basic answer with a couple of methods of promotion discussed.

3- 4 marks - several methods identified.

4c. Select one of the products shown in the table below. Then, describe two of the features that mean it is suitable for manufacture on a production line. ***2 x 2 marks***

STEEL CHAIR	PACKAGE	POLYPROP CHAIR
		
TO HELP YOU ANSWER THIS QUESTION	TO HELP YOU ANSWER THIS QUESTION	TO HELP YOU ANSWER THIS QUESTION

TO HELP YOU ANSWER THIS QUESTION
http://www.technologystudent.com/prddes1/barcelona2.html
http://www.technologystudent.com/grp08/pack1.html
http://www.technologystudent.com/prddes1/polyprop2.html

PRODUCT:

FEATURE 1:

For any marks the product must be clearly identified.

1 mark - one feature identified.

2 mars - 2 features identified.

FEATURE 2:

For any marks the product must be clearly identified.

1 mark - one feature identified.

2 mars - 2 features identified.

4d. For the product you selected in question 4c - name and describe <u>one</u> of the industrial processes used in it's manufacture. *4 marks*

TO HELP YOU ANSWER THIS QUESTION	http://www.technologystudent.com/prddes1/barcelona2.html http://www.technologystudent.com/grp08/pack1.html http://www.technologystudent.com/prddes1/polyprop2.html

INDUSTRIAL PROCESS: _____

DESCRIPTION OF MANUFACTURING PROCESS
INCLUDE NOTES AND A SKETCH(S)

Follow the links for sample manufacturing process for each product.

Use teacher discretion as products can be manufactured in a variety of ways.

1-2 marks - basic description. For 2 marks a sketch must also be present.

3-4 marks - award according to detail

5. This set of questions is concerned with production methods and product systems.

TO HELP YOU ANSWER THIS QUESTION	http://www.technologystudent.com/joints/scalep1.htm http://www.technologystudent.com/joints/revcard_oneoff1.html http://www.technologystudent.com/joints/rev_batch1.html

5a. What is the difference between Prototype Production and Batch Production? Include an example of a product manufactured by each system. ***4 marks***

Follow links for detail on both production systems.

1-2 marks - basic detail but correct in identifying at least one difference between the systems.

2-4 marks according to level of detail.

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/prddes1/prodpack14.html

5b. The image below shows a design for the packaging for a soft drink.

Add notes and sketches to give relevant details about the suitable materials, manufacturing and finishing processes. *4 marks*

Award 1 mark per material, process and finish.

Add discretional mark awarding to level of detail.

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/grp08/pack1.html

5c. The packaging for the soft drink is manufactured through a process called die cutting. In the space below, describe this process. Use notes and sketches. *3 marks*

Follow link for detailed answer.

For full marks the answer must include notes and sketch and have an appropriate level of detail.

Reduce marks according to level of detail / facts included.

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/prddes1/qual2.html

5d. The packaging is checked through a process called Quality Control. What is Quality Control ? *4 marks*

For any marks Quality Control must be clearly identified

1 mark for one facts / appropriate point.

2 marks for two facts / appropriate points.

3 marks for three facts / appropriate points.

4 marks for four facs / appropriate points.

5e. Describe three quality control measures that would be applied to the packaging, to ensure that it is manufactured to the highest possible quality. *3 marks*

1 mark for each quality control measure.

May include - use of a template, sensors, visual checks.

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/designpro/prtpro5.htm

5f. Colour is applied to the die cut package, through a process called lithography.

In the space below, describe this process. Use notes and a sketch(s). *8 marks*

Follow the link for a detailed answer.

Up to 2 marks for a basic description which may include a very basic sketch.

3-4 marks for a greater level of detail and a reasonable sketch.

5-8 marks for an increased level of detail.

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/grp08/biodr1.html

5g. Describe / explain the advantages of using biodegradable inks, for printing on the surface of the packaging. ***4 marks***

Award a mark per advantage.

Follow the link for a detailed answer.

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/despro_flsh/revise11.html

6. This set of questions relates to human factors and inclusivity

6a. Explain the term ANTHROPOMETRICS. *2 marks*

1 mark for basic answer
2 marks for detailed answer.

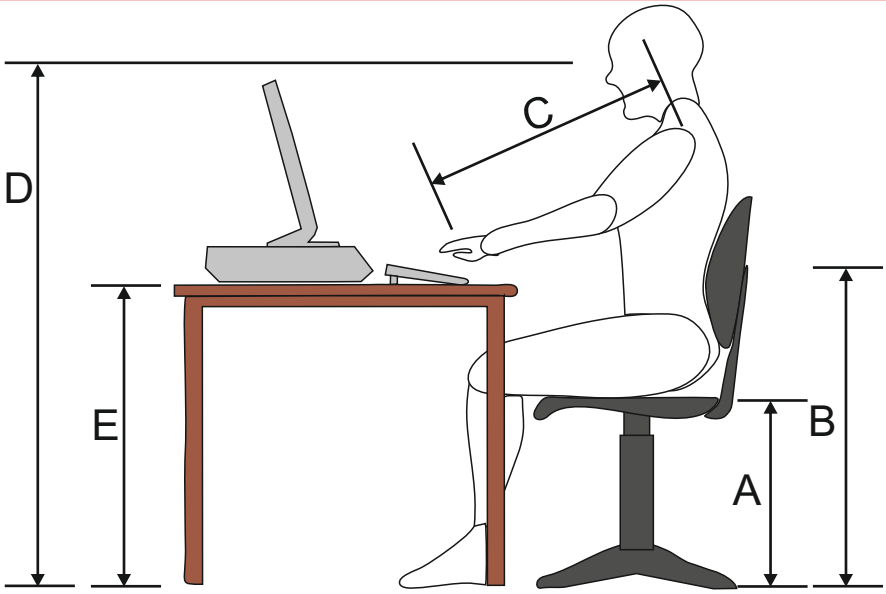
Follow link for detailed answer'

6b. Explain the term ERGONOMICS. *2 marks*

1 mark for basic answer
2 marks for detailed answer.

Follow link for detailed answer'

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/designpro/ergo1.htm



6c. The diagram opposite shows five important measurements that must be considered when setting up a computer workstation.

For each of the labelled dimensions, explain why it is important. *5 x 2 marks*

MEASUREMENT 'A':

MEASUREMENT 'B':

MEASUREMENT 'C':

MEASUREMENT 'D':

MEASUREMENT 'E':

Award 1 mark for a basic answer

Award 2 marks for relevant detail.

Follow link for sample answers

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/prddes1/inclusive1.html

7. This set of questions is about Inclusivity and products.

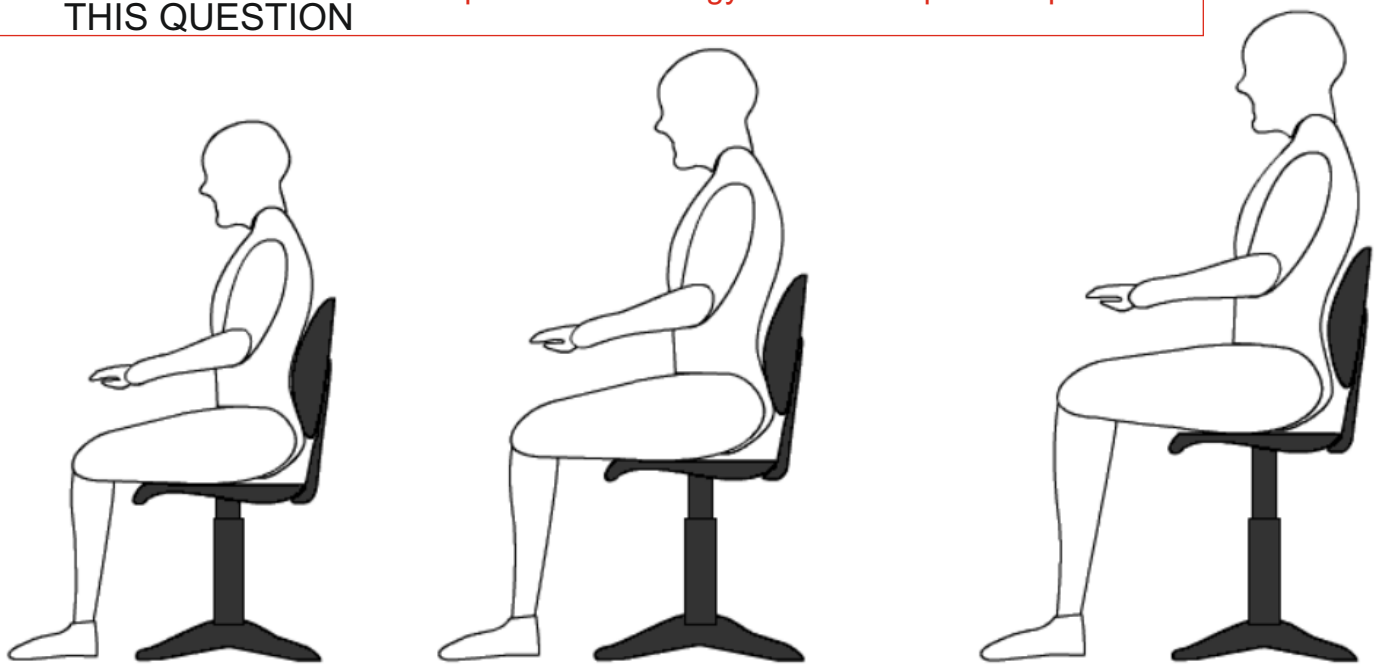
7a. What is an inclusive design? *2 marks*

1 mark for correct answer.

Additional mark for level of detail.

7b. Why can this adjustable office chair be regarded as an inclusive product? *4 marks*

TO HELP YOU ANSWER THIS QUESTION http://www.technologystudent.com/prddes1/pod1.html



Award a mark for each fact / point.

Follow link for sample answer.