

Write your name here

Surname

Other names

**Pearson Edexcel
Principal Learning**

Centre Number

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Candidate Number

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Engineering

Level 2

**Unit 8: Exploring Engineering Innovation,
Enterprise and Technological Advancements**

Thursday 22 May 2014 – Afternoon

Time: 1 hour 30 minutes

Paper Reference

EG208/01

You do not need any other materials.

You are not allowed to bring your pre-release work into this examination.

Total Marks

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Instructions

- Use **black** ink or ball-point pen.
- **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 60.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

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

Turn over ►

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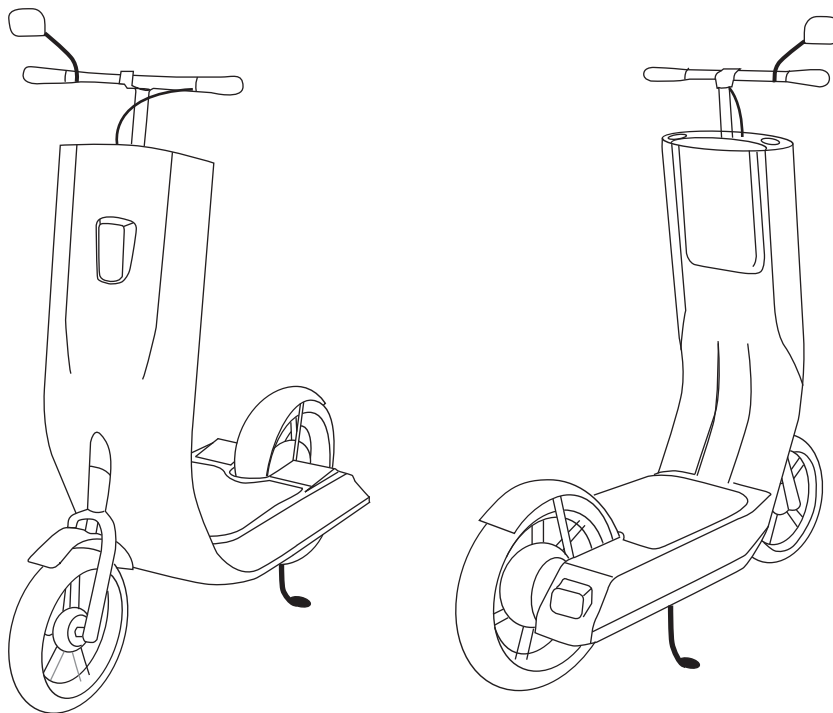
Case Study – Hydrogen Powered Scooter

KleenXtreme is an eco-friendly manufacturing company that has designed a new product. Although the idea is not new, the design and look of the product are its own.

The new product is called the KX2 which is a scooter powered by a hydrogen fuel cell and a body made from a composite material.

The scooter is designed to be environmentally friendly and provide transport over short distances. This is ideal for college campuses, sports villages or busy cities where quick and easy transport is required.

KleenXtreme wants the KX2 to be manufactured using high volume production processes, including those used for manufacturing the aluminium alloy wheels.



Instructions

You are to investigate the viability of the KX2 product. Your study should identify the steps KleenXtreme will need to undertake if the product is to be a success.

Your study should investigate the following areas:

- intellectual property
- research and development activities
- financial review
- a range of materials, their properties and forms of supply
- potential impact of hydrogen fuel cells on a range of environments
- high volume production processes (wheels, the body and handlebars)
- sustainability of resources and social impact.



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

1 There are four types of intellectual property.

(a) Complete the table below by:

(i) identifying the correct type of intellectual property described.

(2)

Intellectual Property	Description
	Protects material such as technical literature and recorded materials
	Protects the visual appearance of a product

(ii) describing each intellectual property.

(4)

Intellectual Property	Description
Trademark	
Patent	

(b) State which organisation KleenXtreme should use to register its design idea.

(1)

(c) What symbol should be used to indicate a trademark if registration is still pending?

(1)



(d) Give **two** advantages of registering intellectual property.

(2)

1

.....

2

.....

The following question must be answered with a cross . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

(e) KleenXtreme is considering applying for a patent for its product.

Identify **two** criteria the product must meet to be considered for a patent.

It must:

(2)

A	be a mathematical discovery	<input type="checkbox"/>
B	have an inventive step of some kind	<input type="checkbox"/>
C	be musical or artistic work	<input type="checkbox"/>
D	have a distinctive logo	<input type="checkbox"/>
E	be capable of industrial application	<input type="checkbox"/>
F	contain a range of moving parts	<input type="checkbox"/>
G	have gone through prototyping	<input type="checkbox"/>

(Total for Question 1 = 12 marks)



2 Before the KX2 can be sold, a number of research, development and financial activities need to be carried out.

(a) Research

Describe **two disadvantages** of carrying out market research activities.

(4)

1

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2

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(b) Development

Describe **two advantages** of using CAD during the development stage of the product.

(4)

1

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2

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(c) Finance

Give **four** different types of organisation or individual that could provide KleenXtreme with funds to support its idea.

(4)

- 1
- 2
- 3
- 4

(Total for Question 2 = 12 marks)



3 KleenXtreme want the KX2 to be made of suitable materials.

(a) (i) State **two** appropriate properties of a composite material that could be used to make the body of the KX2.

(2)

1

2

(ii) Suggest a suitable composite material for the body of the KX2.

(1)

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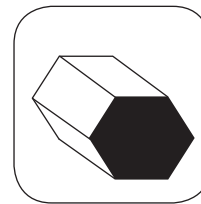
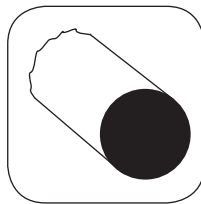
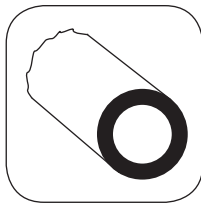
(b) Name a suitable metal for the handlebars of the KX2.

(1)

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(c) The diagrams below show four different forms in which metals can be supplied. Label each form of supply.

(4)



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(d) Define each of the following:

(i) a thermosetting material

(2)

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(ii) a thermoplastic material.

(2)

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(Total for Question 3 = 12 marks)



4 KleenXtreme will use hydrogen fuel cells as a means of providing power for the KX2. This is widely considered to be the energy source of the future.

(a) Identify **two** by-products of using hydrogen fuel cells.

(2)

1

2

(b) Describe **one advantage** of using hydrogen fuel cells in the built environment.

(2)

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(c) Describe **one disadvantage** of using hydrogen fuel cells in the home.

(2)

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(Total for Question 4 = 6 marks)



