Write your name here

Surname	Other names

Pearson Edexcel Principal Learning

Centre Number | | | | | |

Candidate Number | | | | |

Engineering

Level 2

Unit 8: Exploring Engineering Innovation, Enterprise and Technological Advancements

Monday 18 May 2015 – 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

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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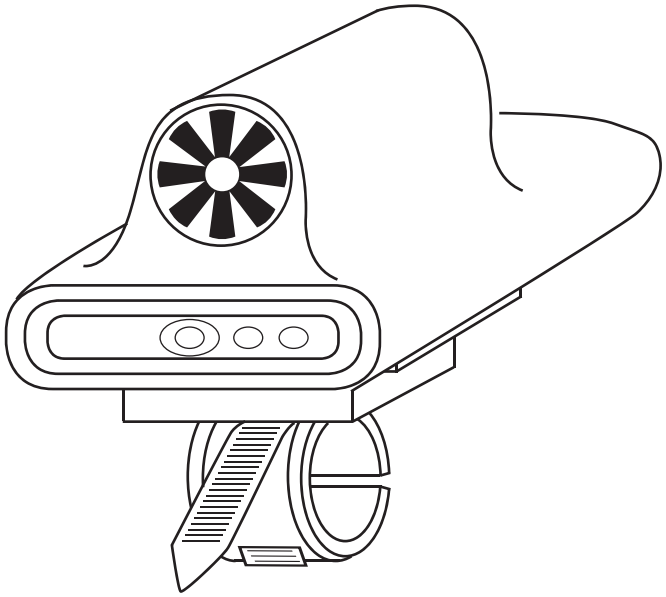
PEARSON

Case Study – Wind Powered Bike Light

Ben has designed an environmentally friendly bike light called BreezeLite. The BreezeLite is powered by a small wind turbine.

The product is still at the concept stage, therefore the design and look of the product are Ben's own. A colleague has offered to help Ben develop the product and has suggested that he should protect his idea.

Ben wants the BreezeLite to be manufactured using high volume production processes.



Instructions

You are to investigate the viability of the BreezeLite product. Your investigation should identify the steps Ben needs to undertake if the product is to be successful.

You should investigate the following areas:

- intellectual property
- finance, research and development activities
- a range of materials, their properties and forms of supply
- creating power from renewable energy sources
- high volume production processes (casing, lens and turbine)
- social and environmental impact.

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

1 (a) On the left there are the four types of Intellectual Property. On the right there is a description of how each offers protection.

Draw a straight line to connect each type of intellectual property to its correct description.

(4)

Type of intellectual property	Description
Design	Protects signs and symbols that can distinguish the goods and services of one trader from those of another.
Trademarks	Protects material such as technical literature and sound recordings.
Patent	Protects the visual appearance or 'eye appeal' of the product.
Copyright	Protects the technical and functional aspects of products or processes.

(b) State which intellectual property type Ben should use to protect the shape of the BreezeLite.

(1)

.....

(c) Give **four** methods of proving ownership of intellectual property.

(4)

1 .....

2 .....

3 .....

4 .....

(d) Trademarks cannot be registered if they are not distinctive. Identify **three** other factors that would prevent a trademark from being registered.

(3)

1 .....

.....

2 .....

.....

3 .....

.....

(Total for Question 1 = 12 marks)

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

(a) (i) Financial

Complete the table by identifying the correct name of the fund provider described.

(2)

Fund Provider	**Description**
	An institution that offers its customers a range of financial services, such as secured loans.
	A person or organisation that will support the development of a product in return for advertising their own business.

(ii) Describe **one** advantage of obtaining a secured loan.

(2)

(b) Research

Explain why it is necessary to carry out market research activities before launching the BreezeLite.

(4)

(c) Development

Describe **two** advantages of producing a prototype before the BreezeLite is mass produced.

(4)

1 .....

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2 .....

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(Total for Question 2 = 12 marks)

3 Ben wants the BreezeLite to be manufactured in large quantities using modern materials.

(a) (i) Suggest a suitable thermoplastic material for the lens of the BreezeLite.

(1)

.....

(ii) State **two** appropriate properties of a thermoplastic material that could be used to make the lens of the BreezeLite.

(2)

1 .....

2 .....

(b) The turbine has been made from an alloy.

(i) Define the term 'alloy'.

(2)

.....

.....

.....

.....

(ii) Give an example of an 'alloy'.

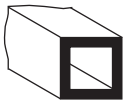
(1)

.....

(c) On the left there are four forms of supply for materials. On the right are four images of a form of supply for materials.

Draw a straight line to connect each form of supply to its correct image.

(4)

Form of Supply	**Image**
Box section	
Angle	
Channel	
Flat bar	

(Total for Question 3 = 10 marks)

4 On the bike, Ben will use a small wind turbine as a renewable source of energy to provide power for the BreezeLite.

(a) Identify **two** other sources of renewable energy.

(2)

1 .....

2 .....

(b) Outline how the wind turbine is used to create power for the BreezeLite.

(4)

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(Total for Question 4 = 6 marks)

5 Ben plans to use injection moulding to manufacture the majority of the plastic parts for the BreezeLite.

Describe the process of injection moulding, including the key features of using this technology. You may use diagrams.

(Total for Question 5 = 8 marks)

6 Ben is concerned about the environmental impact of the BreezeLite.

Explain how the manufacture of the BreezeLite could impact on the environment in terms of:

(a) waste disposal

(6)

(b) energy efficiency

(6)

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS