

Write your name here

Surname

Other names

**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**

Wednesday 11 January 2012 – Morning

**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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**PEARSON**



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## Case Study – Vacuum Backpack

Rachel has designed a convenient household product called a VacBack. The VacBack is powered by an on board, rechargeable battery. This product is still at the concept stage, therefore the design and look of the product is her own work. A friend has offered to help Rachel develop the product and has suggested that she should protect her idea.

Rachel wants her VacBack to be manufactured using high volume production processes.



### Instructions

You are to investigate the viability of a VacBack product. Your study should identify the steps Rachel will need to undertake if the product is to be a success. Your study should investigate the following areas:

- intellectual property
- financial support
- research and development, including testing
- a range of suitable materials and their properties, including those used in the power source
- high volume production processes (hose, main suction tube, nozzle and buckle)
- potential impact on the home, workplace and built environment
- social and environmental impact



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

- 1 (a) The four main types of intellectual property are shown on the left. 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	Description
Trademark	Protects the visual appearance or 'eye appeal' of the product
Patent	Protects material such as art, music and sound recordings
Copyright	Protects signs and symbols that can distinguish the goods and services of one trader from those of another
Design	Protects the technical and functional aspects of products or processes



(b) (i) State which intellectual property type Rachel should use to protect the technical literature that should be supplied with the VacBack.

(1)

(ii) For this type of intellectual property, state **four** simple methods of proving ownership.

(4)

1 .....

2 .....

3 .....

4 .....

(c) Give **three** advantages of registering intellectual property for the VacBack product.

(3)

1 .....

2 .....

3 .....

**(Total for Question 1 = 12 marks)**



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

(a) Financial

Draw a straight line to connect each type of fund provider to the most appropriate description.

(4)

**Fund provider**

**Description**

Stakeholder

An institution that offers its customers a range of financial services such as loans

Building Society

A person or organisation that will support the development of a product

Venture Capitalist

An individual or group with an interest in the success of the VacBack

Sponsor

A speculator who makes money available for innovative projects





3 Rachel aims to produce the VacBack in large numbers using modern materials.

(a) Identify **two** physical properties of a material that would be suitable for extruding the main suction tube.

(2)

1 .....

.....

2 .....

.....

(b) Name **one** appropriate metal that is suitable for extruding the main suction tube.

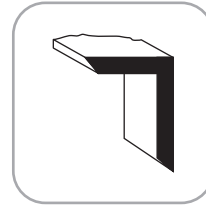
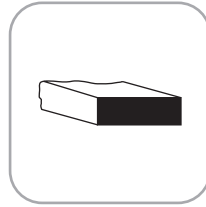
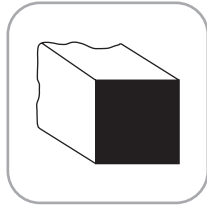
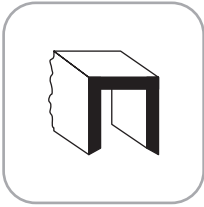
(1)

.....

(c) The diagrams below show **four** different forms that materials are supplied in.

Label each of the forms.

(4)



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(d) What is meant by the term **alloy**?

(2)

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(e) (i) Define a ferrous metal.

(1)

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(ii) Name a ferrous metal.

(1)

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**(Total for Question 3 = 11 marks)**

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4 Rachel's product uses rechargeable batteries.

(a) Identify a specific material that is used to make the cells in the batteries.

(1)

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.....

(b) Explain **two** disadvantages of using rechargeable batteries in the home environment.

(4)

1 .....

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2 .....

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**(Total for Question 4 = 5 marks)**





6 Rachel is very concerned about environmental issues.

Identify and explain how the manufacture of the VacBack could impact on the environment in terms of the following:

(a) waste disposal

(6)

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