Write your name here

Surname	Other names

Edexcel
Principal Learning

Centre Number	Candidate Number

Engineering

Level 2

Unit 8: Exploring Engineering Innovation, Enterprise and Technological Advancements

Tuesday 14 January 2010 – 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

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.

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H 3 5 7 8 4 A 0 1 1 2

Turn over ▶

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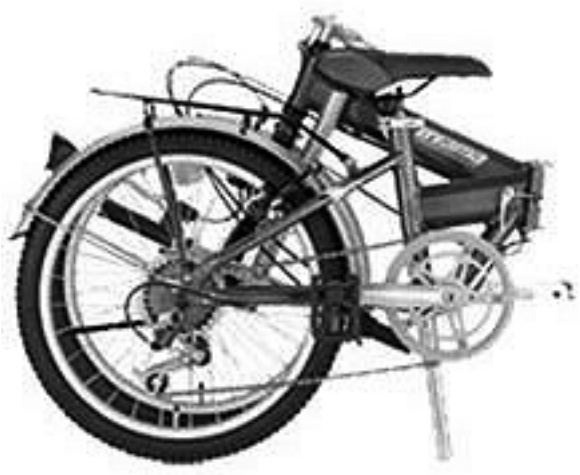
The following questions are based on the pre-released case study, which you have already prepared for.

Susan has designed a fold away bicycle called Pack-a-Bike and, although the idea is not new or novel, the design and look of the product are her own work. A friend has offered to help Susan develop the product and has suggested that she should protect her idea. Susan and her friend will research how this is done.

Susan wants her bicycle to be built from a range of sustainable and recyclable materials.



Instructions
You are required to investigate the viability of the Pack-a-Bike product. Your study should identify the steps Susan will need to undertake if the product is to be a success. Your study should include investigating the following areas:

- intellectual property
- research and development, including testing
- financial support
- sustainability of a range of materials and their properties (frame, saddle and mudguards)
- potential impact on the home, workplace and built environment
- social and environmental impact.

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

1 There are four types of intellectual property; they are patent, design, trademark and copyright.

(a) Below are five descriptions, put a cross ☒ in the box that correctly describes the term 'copyright'. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

(1)

A	Protects the visual appearance or 'eye appeal' of products.	☒
B	Protects signs or symbols that can distinguish the goods and services of one trader from those of another.	☒
C	Protects material such as technical literature and sound recordings.	☒
D	Protects a product from theft and stops unauthorised copying.	☒
E	Protects the retail marketplace and price of a product.	☒

(b) State which intellectual property Susan should use to protect her Pack-a-Bike idea.

(1)

.....

(c) State which UK organisation Susan should contact to register her intellectual property rights.

(1)

.....

(d) Give **three** advantages of registering intellectual property for the Pack-a-Bike product.

(3)

1 .....

2 .....

3 .....

(Total for Question 1 = 6 marks)

2 Before Susan's product can be sold, a number of research, finance and development activities need to be carried out.

(a) Research

Give **four** different market research activities that could be used to determine whether the product might be successful when it reaches the market.

(4)

1 .....

2 .....

3 .....

4 .....

(b) Finance

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

(4)

1 .....

2 .....

3 .....

4 .....

(c) Development

Describe **two** different types of pre-production test that can be carried out on the Pack-a-Bike.

(4)

1 .....

.....

.....

.....

2 .....

.....

.....

.....

(Total for Question 2 = 12 marks)

3 Susan needs to know about the different materials that are available to her before she produces her Pack-a-Bike.

(a) The diagrams below show **four** different forms that materials can be supplied in. Label each.

(4)

....

....

(b) State **two** corrosion resistant metals.

(2)

1 .....

2 .....

(c) A polymer that can be remoulded repeatedly is classified as a:

(1)

.....

(d) Draw a straight line to connect each material to the most appropriate description.

(5)

Material	Description
Titanium	Black colour, flexible, non-metal
Carbon fibre	Grey colour, high strength, expensive
Steel	Grey colour, inexpensive, ferrous
Rubber	Silver-grey colour, lightweight, non-ferrous
Aluminium	Black colour, lightweight, expensive

(Total for Question 3 = 12 marks)

4 Susan will build the Pack-a-Bike frame from aluminium alloy.

(a) Explain the term 'alloying' and outline the process.

(5)

(b) Explain the advantages and disadvantages of using alloyed metals.

(5)

(Total for Question 4 = 10 marks)

5 Susan has decided the mudguards of the Pack-a-Bike will be made from an injection moulded polymer.

Identify what specific type of polymer would be suitable, state its properties and explain the moulding process. You may use diagrams.

(Total for Question 5 = 10 marks)

6 Susan is very concerned about social and environmental issues.

(a) Suggest **one** way the manufacture of the Pack-a-Bike might impact on the environment in terms of each of the following:

(3)

Use of material

.....

Waste disposal

.....

.....

Energy efficiency

.....

.....

(b) Identify and explain **two** positive social impacts of **using** the Pack-a-Bike.

(4)

1 .....

.....

.....

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2 .....

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.....

(c) Explain design considerations for end of life disposal of the Pack-a-Bike.

(3)

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(Total for Question 6 = 10 marks)

TOTAL FOR PAPER = 60 MARKS

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