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 25 May 2010 – 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.

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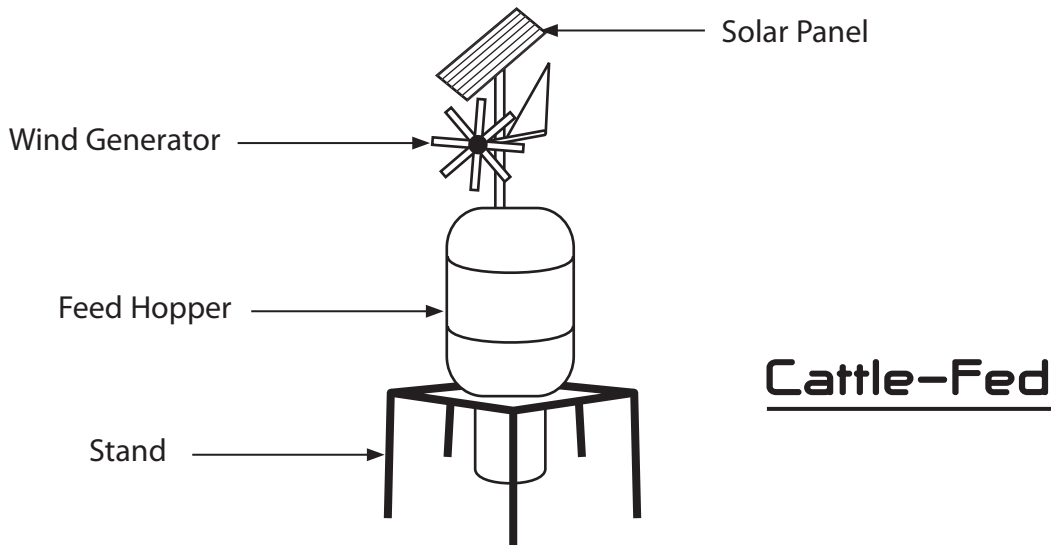
The following questions are based on the pre-released case study which you have already prepared for.

Michael and David have thought up a technical idea and want to produce and sell their new product. The idea is to manufacture an automatic cattle feeder called Cattle-Fed. The novel idea puts together existing technologies such as wind and solar power combined with an electronic timer. Michael and David want to protect their idea, and supporting technical documentation, because it is substantial and new.
Michael and David will research the market place to identify demand for the product and how it will impact on everyday life. They will calculate set-up, marketing and production costs for the product and also estimate their financial requirements, to make Cattle-Fed a success.

Michael and David want their product to meet three main criteria:

1. To be made of suitable materials.
2. The production process (or build) to have as little negative impact on the environment as possible.
3. To ensure that the product is recyclable, or biodegradable when its life is finished.



Instructions
You are required to investigate the viability of the Cattle-Fed product. Your study should identify the steps Michael and David 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 (feed hopper)
- potential impact on the home, workplace and built environment
- social and environmental impact

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

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

(a) Look at the descriptions below for each intellectual property. Match the different types of intellectual property to its correct description. Write your answers in the spaces provided.

(4)

Patents	Designs	Trademarks	Copyrights

..... protect the visual appearance or 'eye appeal' of products.

..... protect signs or symbols that can distinguish the goods and services of one trader from those of another.

..... protect the technical and functional aspects of products and processes.

..... protect material such as literature, art, music, sound recordings, films and broadcasts.

(b) State which intellectual property Michael and David should use to protect the Cattle-Fed logo.

(1)

.....

(c) (i) State what the symbol © means and where it might be found for this product.

(2)

.....

.....

.....

.....

(ii) For this intellectual property, describe simple methods of proving ownership.

(3)

.....

.....

.....

.....

.....

.....

(Total for Question 1 = 10 marks)

2 Before the Cattle-Fed product can be sold, a number of financial, developmental and research activities need to be carried out.

(a) Financial

Explain the advantages and disadvantages of a secured loan.

(4)

Advantages

Disadvantages

(b) Development

State **two** factors which must be considered when testing the safety of the Cattle-Fed product.

(2)

1 .....

2 .....

(c) Research

Identify and describe **two** research methods.

(4)

1 .....

2 .....

(Total for Question 2 = 10 marks)

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3 Michael and David need to understand materials before they can safely and cost-effectively produce their Cattle-Fed product.

(a) Brass is an alloy of which **two** metals?

(2)

1 .....

2 .....

(b) The diagrams below show **four** different forms that materials are available in.

Label each.

(4)

....

....

(c) Draw a straight line to connect each property to the most appropriate description.

(4)

Properties	Descriptions
Strength	The ability of a material to resist a force or stress without breaking
Plasticity	The ability of a material to withstand a sudden impact or force
Toughness	The ability of a material to return quickly to its original shape after being bent or deformed
Elasticity	The ability of a material to deform to a stretched state when a load is applied and retain its change in shape after the load is removed

(d) Define the term **annealing** and describe the process.

(4)

.....

.....

.....

.....

(Total for Question 3 = 14 marks)

4 One of the components of the Cattle-Fed is a feed hopper.

(a) Identify suitable material properties for the feed hopper.

(2)

(b) Considering your answer in (a), select an appropriate material.

(1)

(c) Explain the advantages and disadvantages of the material given in (b).

(3)

(Total for Question 4 = 6 marks)

5 Taking any new product from initial idea to the end user will have an impact on the environment.

(a) Suggest an environmental impact and how it could be reduced for each of the **two** activities below.

(i) Production process

(2)

Impact

Reduction

(ii) Raw materials and transport

(2)

Impact

Reduction

(b) Evaluate the potential environmental impact of the Cattle-Fed product.

(6)

(Total for Question 5 = 10 marks)

6 Cattle-Fed is powered by sustainable sources of energy.

(a) Compare and contrast the **two** different sustainable sources of electricity generation.

(5)

(b) Identify ways Michael and David can reduce the energy consumption associated with making the component parts of the Cattle-Fed product.

(5)

(Total for Question 6 = 10 marks)

TOTAL FOR PAPER = 60 MARKS