

Design & Technology

Edexcel GCSE

Biofuels

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

Advice

- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don't spend too much time on one question

Good luck!

Q1. Which type of renewable energy is sourced from plants?

- A** Biomass
- B** Solar
- C** Tidal

Q2. What is bioethanol made from?

- A** Crude oil
- B** Fermented sugar or starch crops
- C** Coal

Q3. Why are biofuels described as almost carbon neutral?

- A** They release no carbon dioxide when they are burned
- B** They are made from fossil fuels
- C** The carbon dioxide absorbed by plants as they grow is about the same as the amount released when burned

Q4. Which of the following is a disadvantage of biofuels?

- A** Land used to grow fuel crops may be needed to grow food
- B** They will eventually run out
- C** They cannot be stored

Q5. Which of the following can be used to make biodiesel?

- A** Natural gas
- B** Used cooking oil
- C** Uranium

Q6. What does E10 petrol contain?

- A** 10% biodiesel
- B** 10% water
- C** 10% bioethanol

Q7. A wooden toy sheep is made by a small manufacturer. The wood used to make the sheep is delivered to the manufacturer using vehicles powered by biofuels.

Explain one advantage of using biofuels to power the delivery vehicles. **(2 marks)**

Q8. Renewable energy can be used to create electricity.

Complete the missing information in the table below. **(4 marks)**

Description of how renewable energy is used to create electricity	Type of renewable energy
A dam is used to trap water; when water is released it turns turbines which turn generators	
.....	Wind power
Photovoltaic cells convert light to electricity	
Fuel (wood, organic material, sugar cane etc.) is burnt to generate heat which creates steam and turns turbines which turn generators	

Answers

Q1. A

Q2. B

Q3. C

Q4. A

Q5. B

Q6. C

Q7.

Any one advantage of using biofuels (1 mark) and a linked justification of that advantage (1 mark). Possible points include:

- Biofuels are a renewable/sustainable source of energy (1), which means there will always be a supply/they will not run out/they reduce the rate at which conventional fuels are being used (1)
- Less carbon is emitted when burnt as fuel (1), which reduces pollution levels/emissions from the delivery vehicles (1)
- Biofuels are relatively carbon neutral/have a smaller carbon footprint (1), which means the absorption of CO₂ during growth is almost equal to the emissions produced when being burnt (1)

Q8.

1 mark for each correct answer (4 marks):

- A dam is used to trap water...: Hydroelectric (1)
- Wind power: Blades catch wind, which turn turbines/power generators (1)
- Photovoltaic cells convert light to electricity: Solar power (1)
- Fuel (wood, organic material, sugar cane etc.) is burnt...: Biomass or biofuel (1)