



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

21ST CENTURY SCIENCE

0608/01

Paper 1

For Examination from 2009

SPECIMEN PAPER

1 hour

Additional Materials: Multiple Choice Answer Sheet
 Soft clean eraser
 Soft pencil (type B or HB is recommended)
 Data Booklet

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will **not** be deducted for a wrong answer.

Any rough working should be done in this booklet.

This document consists of **15** printed pages and **1** blank page.



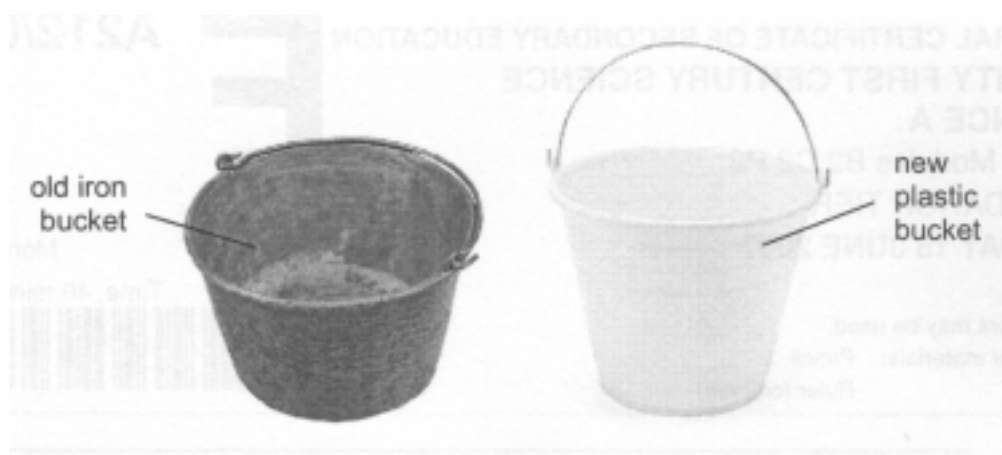
- 1 Petrol, diesel fuel and fuel oil contain mainly compounds of two elements. Which are these two elements?
- A carbohydrate and hydrogen
 - B carbon and hydrogen
 - C carbon dioxide and hydrogen
 - D carbon and oxygen
- 2 Which of these formulae represent the two gases produced when petrol burns completely?
- A CO and H₂O B CO₂ and H₂O C NO₂ and H₂O D SO₂ and H₂O
- 3 Using cars causes air pollution.
- If more people travelled by bus, there would be less air pollution. Which is the best explanation for this?
- A Buses are bigger than cars
 - B A bus uses less fuel than a car.
 - C Buses do not produce pollutant gases.
 - D Each bus carries more people than each car.
- 4 When fuel is burned in power stations, sulfur dioxide is released into the air.
- What happens to this sulfur dioxide?
- A It escapes into space.
 - B It reacts with nitrogen dioxide to make acid rain.
 - C It reacts with water and oxygen to make acid rain.
 - D It forms deposits of sulfur.

- 5 The number of cars driving on the streets of a city reaches a maximum during the early morning and early evening.

The concentration of carbon monoxide in the air of a city reaches a maximum during the early morning and early evening.

Which of these is the best conclusion to draw from these data?

- A** Driving cars causes the rise in concentration of carbon monoxide.
- B** There is a correlation between the number of cars driven and the concentration of carbon monoxide.
- C** An increase in the number of cars results in an increase in concentration of carbon monoxide.
- D** There is no connection between the number of cars and concentration of carbon monoxide
- 6 Most buckets used to be made of iron. Now most buckets are made of plastic.



Which statement gives the best reason for using a plastic bucket instead of an iron bucket to carry hot water?

- A** iron rusts but plastic does not
- B** iron is stiffer than plastic
- C** iron melts at a higher temperature than plastic
- D** iron is stronger than plastic

- 7 The effects of a product on the environment can be considered by using a Life Cycle Assessment (LCA).

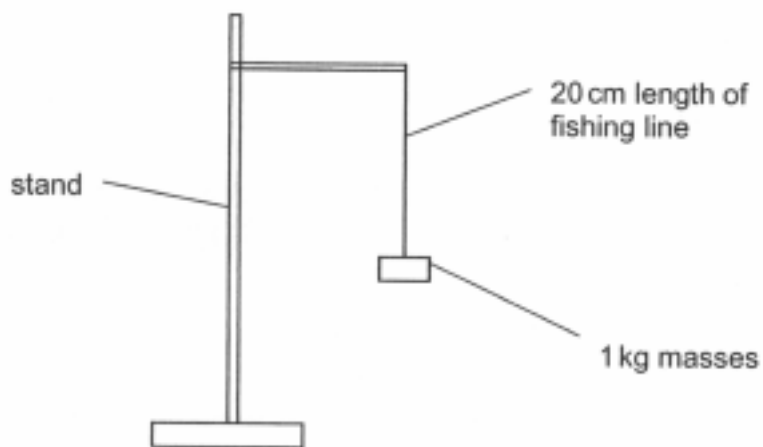
Which of these is part of the LCA for a plastic bucket?

- A the energy used to make the plastic
 - B the strength of the plastic
 - C the cost of the plastic
 - D the density of the plastic
- 8 Scientists want to conserve natural resources and protect the environment. This is called sustainable development.

Which of the following would make our use of plastics more sustainable?

- A use plastic film to keep food fresh
- B use plastic that has a high melting point
- C use landfill sites to dispose of waste plastic
- D use plant materials to make plastic

The diagram shows apparatus used to test the strength of fishing line. The mass is increased until the line breaks. Use this diagram to help you answer questions 9 and 10.



- 9 Scientists test six samples of each fishing line, and take an average.

Why do they test six samples instead of just one?

- A to make sure it is a fair test
- B so that they can improve with practice
- C to make the result more reliable
- D they have lots of fishing line available

- 10 The table shows the mass needed to break each of six samples of one type of fishing line.

sample	1	2	3	4	5	6
mass needed/kg	12	5	12	11	9	11

One of these results is an outlier.

To get a best estimate ignore the outlier and work out the mean (average) of the other five results.

This best estimate is

- A** 9 kg **B** 10 kg **C** 11 kg **D** 12 kg
- 11 Farmers use different methods to protect their crops from pests and diseases.
Which of these methods is most likely to have a bad effect on the environment.
- A** crop rotation **B** herbicide **C** hand weeding **D** natural predators
- 12 Which of these is **not** an essential part of a balanced diet?
- A** carbohydrate **B** fat **C** protein **D** urea
- 13 Which additive is added to food to prevent the growth of harmful microbes?
- A** antioxidant **B** flavouring **C** preservative **D** sweetener
- 14 An emulsifier is added to certain foods to help mix the ingredients and prevent them separating.
Which ingredients are these?
- A** vinegar and water
B oil and water
C flour and sugar
D solids and liquids

15 Genes make up chromosomes in the nuclei of cells.

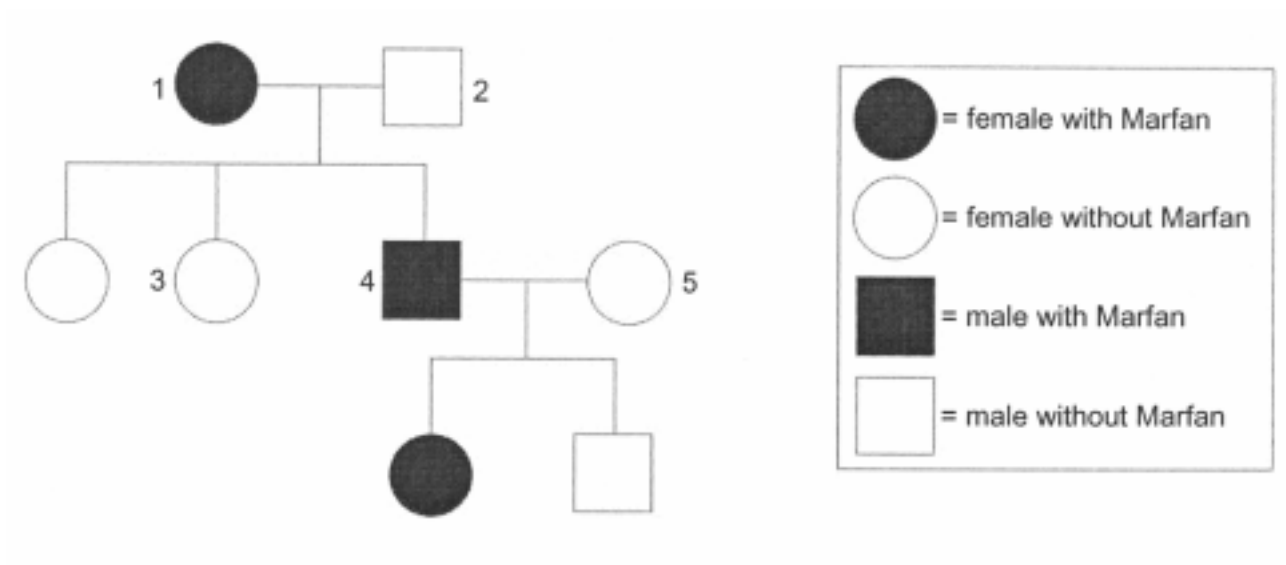
Which is the correct description of a gene?

- A a section of a protein
- B a section of an enzyme
- C a collection of enzymes
- D a section of DNA

16 A gene gives instructions for a cell that describe how to make

- A carbohydrate
- B protein
- C fat
- D DNA

Marfan syndrome is an inherited disorder caused by a single gene. It is caused by a dominant allele. The diagram shows a family tree. Use this diagram to help you answer questions 17 and 18.



A is used to represent the dominant allele for Marfan, and **a** is used to represent the recessive allele for normal.

17 What is the genotype of the person labelled 5?

- A AA
- B Aa
- C aA
- D aa

18 Which number on the family tree represents a female with the genotype **Aa**?

- A** 1 **B** 2 **C** 3 **D** 4

19 Which system helps to protect the body from infection?

- A** nervous system
B digestive system
C skeleton
D immune system

20 White blood cells can release substances that kill invading micro-organisms.

These substances are called

- A** allergies **B** antibiotics **C** antibodies **D** allotropes

21 Vaccination can be used to protect us from some diseases.

Why do new vaccines against influenza have to be developed regularly?

- A** The influenza virus changes very quickly.
B The vaccines do not last very long.
C The vaccines are difficult to make.
D The effect of the vaccine wears off.

22 The rate of death from heart disease in the United Kingdom fell from 1987 to 2007.
The number of people in the United Kingdom who smoke cigarettes fell from 1987 to 2007.

What can be concluded from this data.

- A** smoking causes heart disease
B there is a correlation between the decrease in smoking and the decrease in heart disease
C people with heart disease smoke more than those without heart disease
D there is no connection between smoking and heart disease

23 In non-industrialised countries the rates of death from heart disease are lower than they are in the United Kingdom.

Which statement gives the best reason why these people have less heart disease?

- A they earn less money
- B they have fewer medicines
- C they eat less fatty food
- D they live mainly outdoors

24 Which of these statements about hormonal and nervous communication is true?

- A nervous response lasts a long time
- B hormones travel in the blood
- C hormonal response is quicker than nervous response
- D hormonal communication travels through the central nervous system

25 Evolution happens due to which process?

- A natural selection
- B selective breeding
- C cloning
- D reproduction

26 Which type of cell is **not** part of the nervous system?

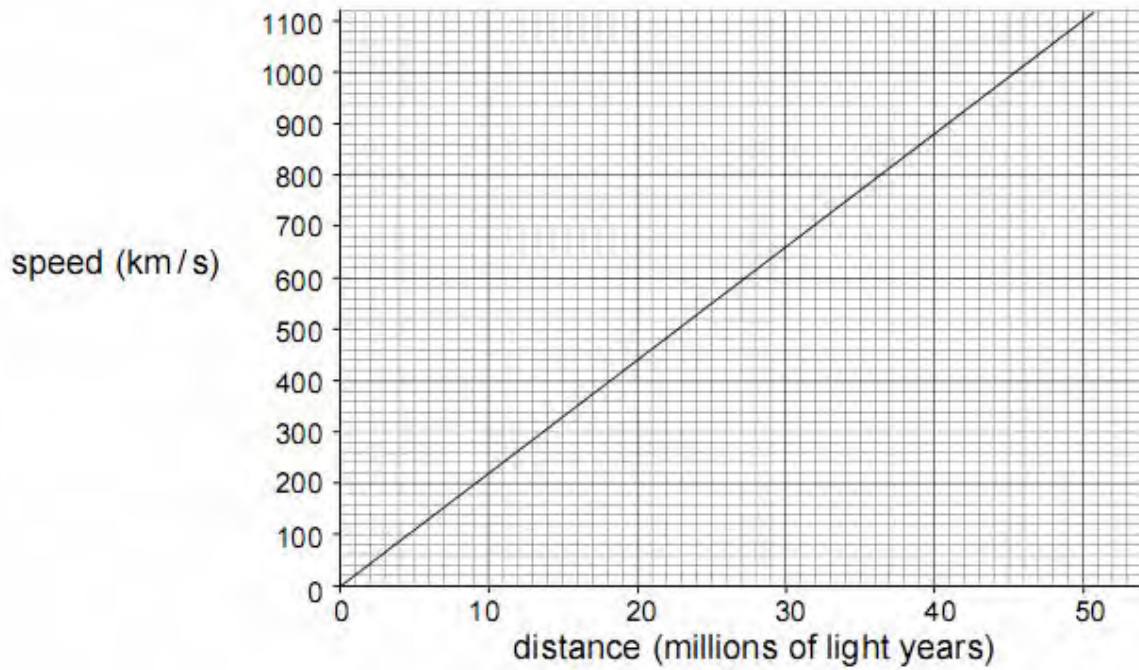
- A sensor
- B neurone
- C effector
- D muscle

27 These statements give both data about evolution and part of the explanation for evolution.

Which of the statements is part of the **explanation** for evolution?

- A 98% of human genes are the same as those of a chimpanzee
- B 85% of human genes are the same as those of a mouse
- C life on Earth started from a few simple living things
- D there are gaps in the evolutionary record

- 28 Recent work by astronomers shows that galaxies are moving relative to us with speeds given by this graph:



galaxy	speed (km/s)
A	500
B	1100
C	600
D	300

Which one of the galaxies in the table is 23 million light years away from us?

A

B

C

D

Use this information to help you answer questions 29 and 30.

Four people find out that a new mobile phone (cell phone) transmitter is planned for their area. This is what they say:

The diagram consists of four portrait photos of people arranged in a 2x2 grid. Each photo is connected by a line to a speech bubble containing a statement. The labels A, B, C, and D are placed inside the speech bubbles.

- A** (top-left): "I think that mobile phones cause cancer, but I don't know how."
- B** (top-right): "We should keep the number of phone masts down to the smallest number needed, just in case there is a real problem."
- C** (bottom-left): "I don't think we should take any risks with our health."
- D** (bottom-right): "I saw on television that there are more cases of cancer in places near these transmitters."

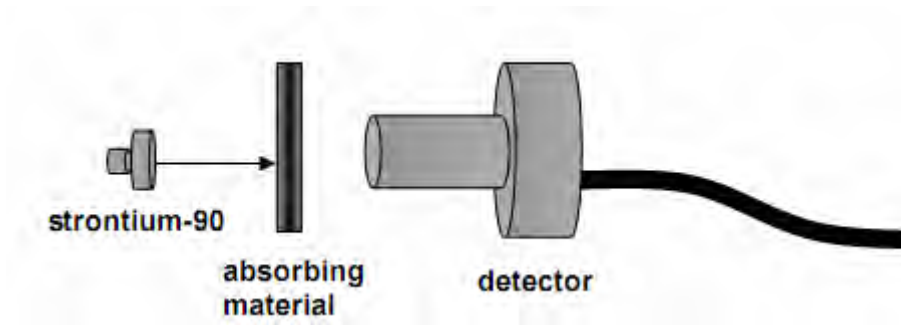
29 Which person is referring to a **correlation** between a risk and an outcome?

A B C D

30 Which person is referring to a risk being the **cause** of an outcome?

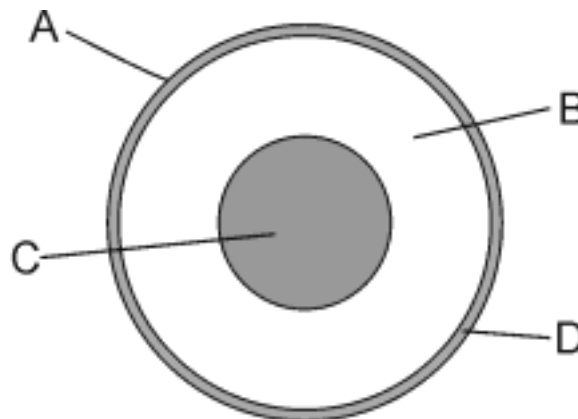
A B C D

- 31 Strontium-90 is radioactive. It emits beta radiation.
One way of classifying different types of radioactive emission is by their penetration properties.
An experiment was done to confirm that strontium-90 is emitting beta radiation.



Which correctly describes the penetration properties of beta radiation?

- A It can pass through a few cm of lead, but not thick concrete.
 - B It can pass through a few cm of aluminium, but not a few cm of lead.
 - C It can pass through a sheet of paper, but not a few cm of aluminium.
 - D It can pass through a few cm of air, but not a sheet of paper.
- 32 Look at the diagram showing parts of the Earth.



Which part is the **mantle**?

- A B C D

Questions 33 and 34 are about earthquakes in San Francisco in California.

The pictures below show San Francisco City Hall before and after the 1906 earthquake.



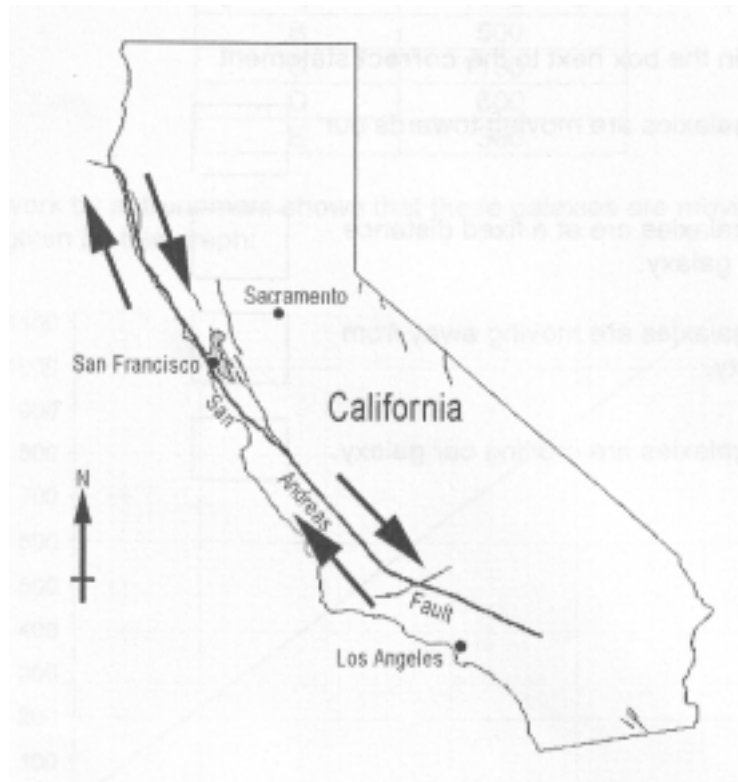
before the earthquake

after the earthquake

33 Where are earthquakes most likely to happen?

- A** at the centre of a tectonic plate
- B** at the edge of a tectonic plate
- C** at the South Pole
- D** in the desert

- 34 The map shows the position of the San Andreas Fault, San Francisco and Sacramento in California.



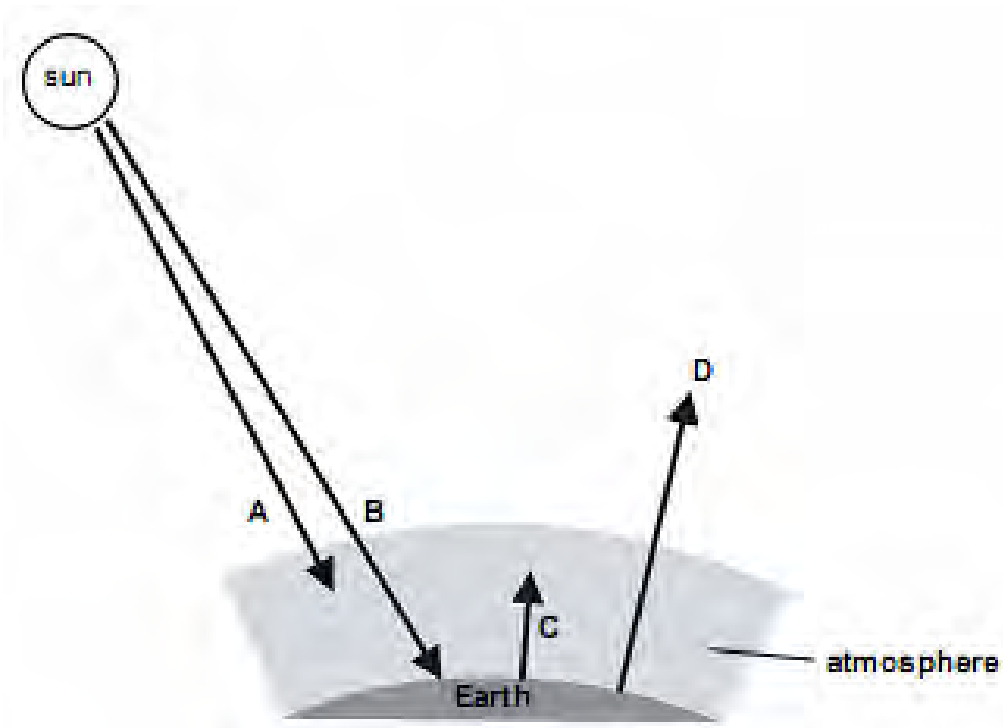
The California State Government is planning to build new houses. It is worried about future earthquakes on the San Andreas Fault. Here are some possible actions that the State Government could take.

- W** build bigger buildings along the San Andreas Fault
- X** build taller buildings along the San Andreas Fault
- Y** build more new houses at Sacramento
- Z** stop building new houses along the San Andreas Fault

Which **two** are sensible actions that the State Government could take?

- A** **W** and **Y**
- B** **W** and **Z**
- C** **X** and **Y**
- D** **Y** and **Z**

Use this diagram to help you answer questions 35, 36 and 37. These questions are about the effect of electromagnetic radiation on the Earth's atmosphere.



The four arrows **A**, **B**, **C** and **D** in the diagram show electromagnetic radiation.

35 Which radiation warms the Earth's surface?

A **B** **C** **D**

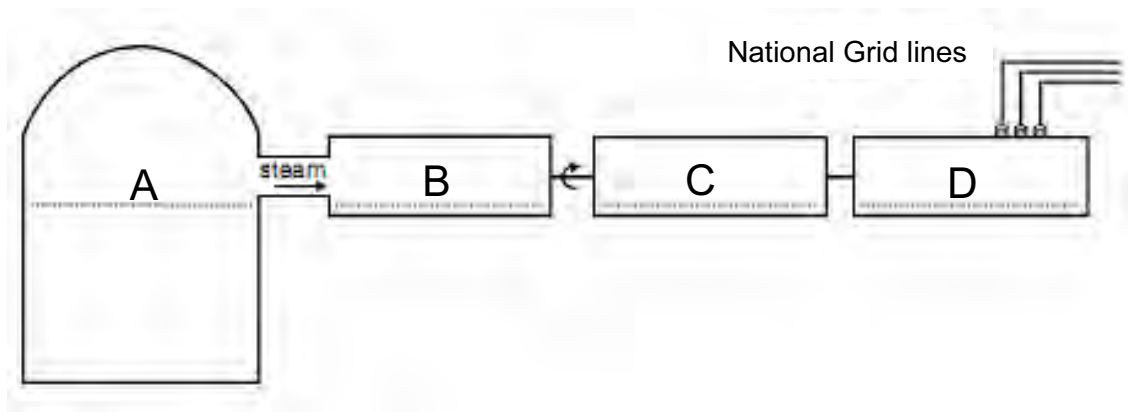
36 Which radiation is absorbed by the ozone layer?

A **B** **C** **D**

37 Which radiation produces the greenhouse effect?

A **B** **C** **D**

The diagram below shows how a nuclear power station produces electricity.
Use this diagram to help you answer questions 38 and 39.



38 Which part is the **turbine**?

- A B C D

39 Which part is the **reactor**?

- A B C D

40 Workers in nuclear power stations wear special badges.



Why do the workers need these badges?

- A The badges protect them from radiation.
B Government regulations make them wear these badges.
C The badges are part of the workers' uniform.
D The badges measure their radiation dose.

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