



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

TWENTY FIRST CENTURY SCIENCE (CORE)

0608/01

Paper 1 Multiple Choice

May/June 2011

1 hour

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



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.

You may use a calculator.

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



- 1 A scientist tests an embryo to find out its sex.

If the embryo is a normal male, which sex chromosomes are in each cell?

- A XY B YYX C XX D YXX

- 2 Sickle cell anaemia is a genetic disorder.

What are the symptoms of Sickle cell anaemia?

- A difficulty in breathing and digesting food
B high fever and sweating every evening
C problems with memory loss and controlling movement
D tiredness and pain in the bones and muscles

- 3 A gardener takes two cuttings from a single plant.

He grows them in different places.

The diagram shows the plants after a few weeks.



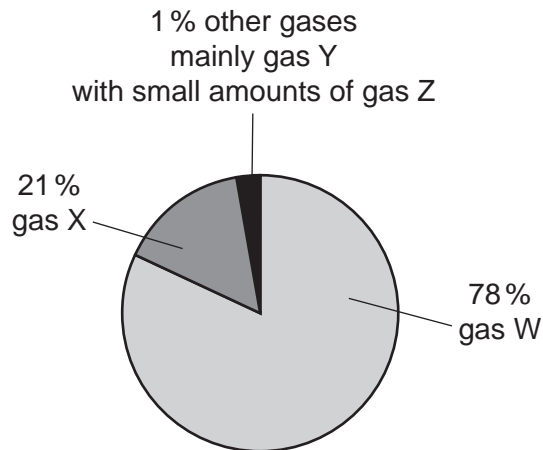
What is the most likely reason for the difference between the two plants?

- A They have different genes.
B They have received different amounts of light.
C The larger plant has more chromosomes in each cell.
D The larger plant has more dominant alleles.
- 4 Jack and John are identical twins.
- How are identical twins produced?
- A An embryo splits into two.
B One egg is fertilised by two sperm.
C An egg splits into two and each is fertilised.
D Two eggs are fertilised by two sperm at the same time.

5 What is an embryonic stem cell?

- A a cell in the embryo that is specialised
- B a cell that can develop into any type of cell
- C a cell that can join with another cell to form an embryo
- D a cell that has half the number of chromosomes

6 The pie chart shows the percentage of gases in air.



What are the names of the gases?

| | W | X | Y | Z |
|----------|----------|----------------|----------------|----------------|
| A | nitrogen | carbon dioxide | oxygen | argon |
| B | nitrogen | oxygen | argon | carbon dioxide |
| C | nitrogen | oxygen | carbon dioxide | argon |
| D | oxygen | nitrogen | argon | carbon dioxide |

The following information should be used to answer questions 7, 8 and 9.

A team of research scientists are collecting data about air quality near a school, on a busy road.

They measure the amounts of some pollutants in the air.
They take readings at 12.00 mid-day and 12.00 midnight.

The table shows their results.

| name of pollutant | amount of pollutant in sample / parts per million | |
|---------------------|---|----------------|
| | 12.00 mid-day | 12.00 midnight |
| sulfur dioxide | 0.2 | 0.1 |
| nitrogen oxides | 0.3 | 0.1 |
| carbon monoxide | 0.2 | 0.1 |
| particles of carbon | 0.1 | 0.05 |

7 Which pollutants are formed by incomplete burning of the fuel?

- A all of them
- B carbon monoxide only
- C carbon monoxide and particles of carbon only
- D sulfur dioxide, nitrogen oxides and carbon monoxide only

8 The scientists are talking about their results.

Which scientist is making a statement that is correct?

A



The levels of pollutants are lower at night.

B



The highest level of pollutant at midday is sulfur dioxide.

C



The amount of particles of carbon increases at night.

D



The level of carbon monoxide doubles at night.

- 9 The scientists talk about how to make a best estimate of the air quality at the school.

Which scientist is talking about making a best estimate?

A



We could take readings at more times during the day.

B



We need to find out what the air quality is like at other parts of the town.

C



If we repeat each reading several times, we could find the average.

D



We could measure the air quality at other schools.

- 10 A car company makes a new type of car. The company says that their new car has 'lower than ever carbon dioxide emissions.'

Which statement explains why the new car has lower carbon dioxide emissions than older cars?

- A The new car has a catalytic converter.
 - B The new car runs on lower sulfur fuel.
 - C The new car is heavier than older cars.
 - D The new car engine is more efficient and gives more kilometres per litre of fuel.
- 11 Rocks provide evidence for changes in the Earth.

Which piece of evidence does **not** come from rocks?

- A erosion
- B folding
- C greenhouse effect
- D sedimentation

- 12 The Earth has many high mountains. Mountains are continually worn down by erosion. The eroded material washes into the sea. Over a few million years, the mountains are worn down to sea level. This time is small compared to the age of the Earth.

Based on this information, which statement must be true?

- A All mountains are formed from materials washed into the sea.
 - B All mountains are many millions of years old.
 - C Mountains are forming all the time.
 - D Mountains were only formed when the Earth first formed.
- 13 What is the source of the Sun's energy?
- A burning
 - B fission
 - C fusion
 - D radiation

- 14 Recent earthquakes in China have caused schools to collapse and many people to be hurt.

The public authorities can try different things to stop this happening in the future.

What will **not** reduce the harm caused by earthquakes?

- A Change building regulations to make buildings stronger.
 - B Educate people so they know what to do if an earthquake happens.
 - C Limit the burning of fossil fuels in power stations.
 - D Prepare emergency plans and train emergency staff.
- 15 What is measured in light years?
- A distance
 - B energy
 - C speed
 - D time

16 Which method could be used to find the distance to a nearby star?

- A fusion
- B parallax
- C radioactive dating
- D radiation

17 Anita is talking about visiting another country.

“Before I go I am going to get a vaccination so that I don’t get yellow fever.”

What does the vaccine contain?

- A a small number of bacteria
- B an antibiotic
- C dead bacteria
- D white blood cells

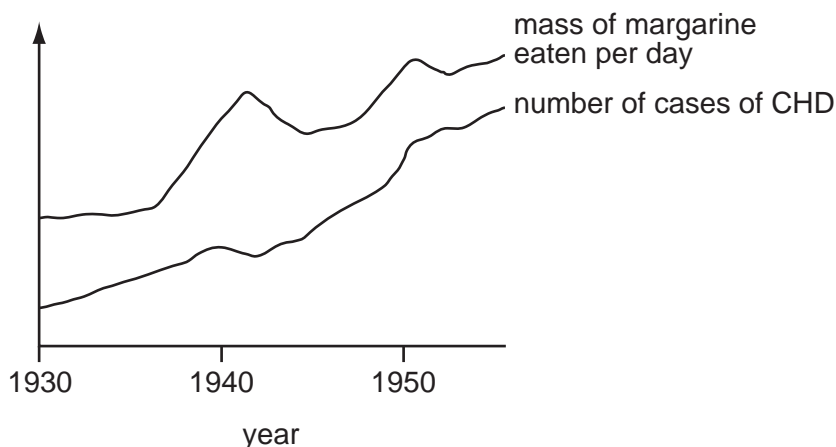
18 Scientists have recently published results of a study into heart disease. The results were published in a scientific journal.

The results were peer reviewed before they were published in this journal.

Why is this?

- A because scientists are interested in improving their health
- B to make sure that the public understand the language used
- C to check that the study was performed in a reliable way
- D to see if the public would be interested in the results

- 19 The graph shows how the average mass of margarine eaten per person has changed over a number of years. It also shows the number of cases of coronary heart disease (CHD) in that time.



What is a reasonable conclusion from this graph?

- A Eating high levels of margarine causes CHD.
 - B The mass of margarine eaten per day has increased by the same amount each year.
 - C There is a correlation between the mass of margarine eaten and the number of cases of CHD.
 - D There is no link between the mass of margarine eaten and the number of cases of CHD.
- 20 Crude oil is used to make many different products for cars.

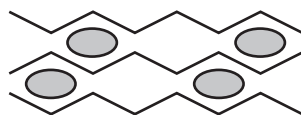
Which product is **not** made from crude oil?

- A lubricating oil for car engines
 - B metal bodywork
 - C petrol for fuel
 - D synthetic polymers for making seat covers
- 21 Poly(ethene) is used to make plastic packaging for foods.

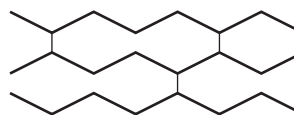
Which statement about poly(ethene) is correct?

- A Poly(ethene) forms when many small molecules join together.
- B Poly(ethene) is a monomer.
- C Poly(ethene) is a natural material made from living things.
- D When poly(ethene) is made, ethene molecules react with water.

22 The diagram shows two polymers, polymer X and polymer Y.



polymer X



polymer Y

Polymer X contains a plasticiser and polymer Y contains cross links.

Which statement about the two polymers is correct?

- A Polymer X has a much higher melting point than polymer Y.
 - B Polymer X is a better electrical conductor than polymer Y.
 - C Polymer X is harder and stronger than polymer Y.
 - D Polymer X is more flexible than polymer Y.
- 23 Some shops now use paper carrier bags instead of plastic carrier bags.

The life cycle assessments for a paper carrier bag and a plastic carrier bag are different.

Which statement gives the best explanation for the difference in life cycle assessment?

- A Plastic bags are more colourful than paper bags.
 - B The bags are different sizes.
 - C The bags are made from different raw materials.
 - D The bags cost different amounts of money.
- 24 Which row gives examples of the uses of infrared and microwave radiation?

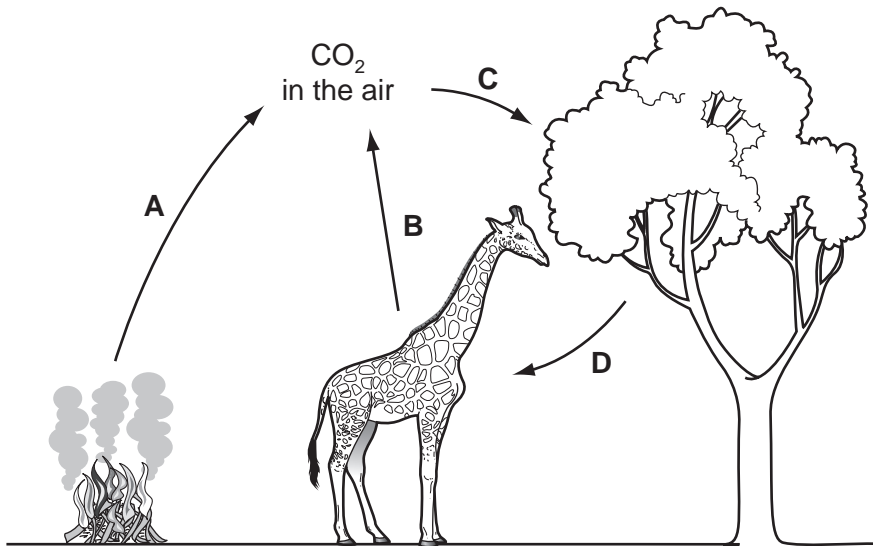
| | infrared | microwaves |
|----------|-----------------------|-----------------------|
| A | mobile phone | TV remote control |
| B | radio control toy car | mobile phone |
| C | satellite TV | radio control toy car |
| D | TV remote control | mobile phone |

25 People often get mixed up about the greenhouse effect and the hole in the ozone layer.

Which statement is correct?

- A Carbon dioxide absorbs most of the ultraviolet light from the Sun.
- B Ozone is a greenhouse gas.
- C The hole in the ozone layer allows more heat emitted by the Earth to escape.
- D The ozone layer protects living organisms from ultraviolet radiation.

26 In the diagram of the carbon cycle, which arrow shows photosynthesis?



27 Global warming can cause severe problems.

What problem is caused by global warming?

- A more earthquakes
- B more floods
- C more skin cancer
- D more volcanic eruptions

28 Some scientists have put forward theories to explain how life on Earth started.

Stanley Miller thought that it was started by lightning in the Earth's early atmosphere.

Fred Hoyle thought that life arrived on Earth from space.

Graham Cairns-Smith thought that life started on Earth from crystals in clay.

Which scientists think that life started on Earth?

- A Fred Hoyle and Graham Cairns-Smith
- B Stanley Miller and Graham Cairns-Smith
- C Fred Hoyle only
- D Stanley Miller only

29 Read the newspaper article.

Low fat sheep

Farmers are planning to use a machine to measure the percentage of body fat in their sheep.
Farmers hope that this will allow them to choose sheep with less fat.
Farmers will then use these sheep to breed a new flock.

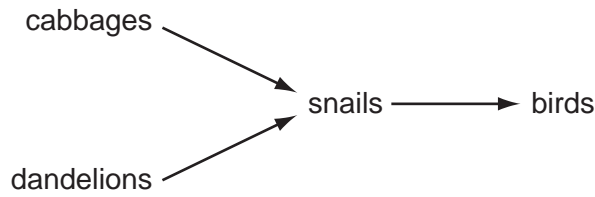
Which process do the farmers want to use to improve their sheep?

- A natural selection
- B gene therapy
- C genetic testing
- D selective breeding

The following information should be used to answer questions **30** and **31**.

A farmer is growing cabbages in his field. Dandelions are growing in between his cabbages.

The diagram shows a food chain from his field.



30 Which statement is correct?

- A** The cabbages and dandelions are competing for sunlight.
- B** The cabbages and dandelions are competing for snails.
- C** The snails and the birds are competing for the plants.
- D** There is no competition between the organisms.

31 Many of the birds in the area are killed by a disease.

What is the likely effect on the farmer's crop of cabbages?

- A** The crop will increase because there will be more snails.
- B** The crop will decrease as more cabbages will be eaten by snails.
- C** There will be no change in the crop as the sunlight will not change.
- D** The crop will increase because there will be less competition with the dandelions.

32 Humans and chimps shared a relative six million years ago.

What is the name given to such a shared relative?

- A** common ancestor
- B** hominid
- C** gene carrier
- D** selected species

33 Which two food additives are added to food to give it a longer shelf life?

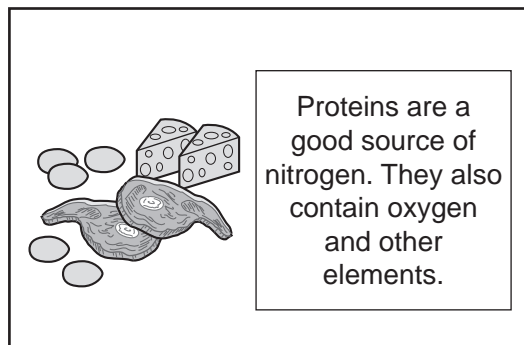
- A artificial sweeteners and preservatives
- B emulsifiers and colourings
- C emulsifiers and flavourings
- D preservatives and antioxidants

34 Food labels show the amount of carbohydrates in foods.

Which substance found in food is **not** a carbohydrate?

- A cellulose
- B glucose
- C protein
- D starch

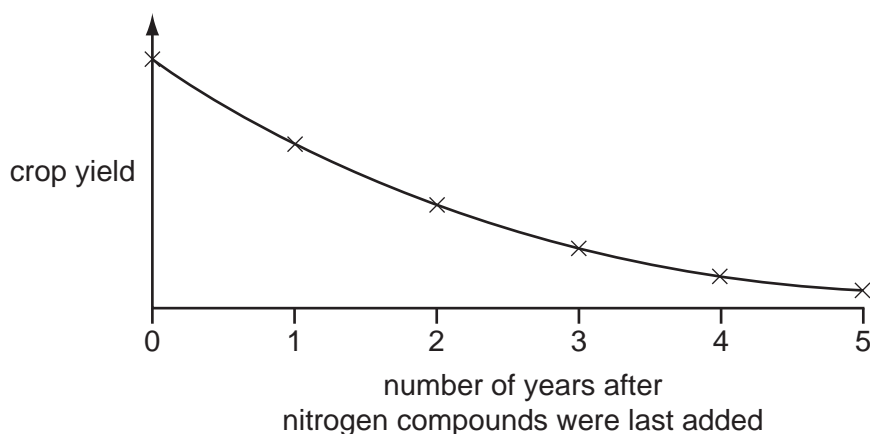
35 Joe makes a poster about proteins.



What other elements do proteins contain?

- A calcium and iron
- B carbon and hydrogen
- C phosphorus and potassium
- D sodium and chlorine

- 36 The graph shows what happens to the crop yield when farmers stop adding nitrogen compounds to the soil.



Which trend does the graph show?

- A Nitrogen compounds are needed for plant growth.
 - B The crop yield falls as the farmers add more and more nitrogen to the soil.
 - C The crop yield falls by half every year.
 - D The longer the time since nitrogen compounds were added to the soil, the lower the crop yield.
- 37 Why is electricity called a secondary energy source?
- A It can be used to power two or more machines at the same time.
 - B It is always produced from other energy sources.
 - C It is easily transmitted.
 - D It was the second energy source discovered.
- 38 In a hospital, radioactive materials are sometimes injected into patients. The syringes used for the injection are then disposed of.

What type of waste are the syringes?

- A high level radioactive waste
- B intermediate level radioactive waste
- C low level radioactive waste
- D non radioactive waste

The following information should be used to answer questions 39 and 40.

The table shows the risks of getting a particular cancer in different jobs.

| type of worker | number of workers | number of workers who developed the cancer | percentage of workers developing cancer |
|----------------|-------------------|--|---|
| medical | 37 650 | 1430 | 2.1 |
| industrial | 59 544 | 997 | 1.7 |
| nuclear power | 21 945 | 564 | 2.5 |
| education | 31 679 | 607 | 1.9 |
| dental | 42 194 | 746 | ? |

39 What is the percentage of workers in dental jobs developing cancer?

- A 0.02 B 1.8 C 17 D 56.5

40 Which workers have the greatest risk of getting cancer?

- A education
B industrial
C medical
D nuclear power

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