



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

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TWENTY FIRST CENTURY SCIENCE (CORE)

0608/01

Paper 1 Multiple Choice

October/November 2013

1 hour

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

* 8 8 2 0 7 0 8 7 1 7 *

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.

DO NOT WRITE IN ANY BARCODES.

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.

Electronic calculators may be used.

This document consists of **14** printed pages and **2** blank pages.



- 1 What happens during **asexual** reproduction?
- A** Genetically identical offspring are made from one parent.
- B** One parent produces two types of sex cell which join.
- C** One parent splits to form two offspring that have different genes.
- D** Two parents make sex cells that join to make an embryo.
- 2 Which statement about identical five year old twins could be true?
- A** They are the same weight but have different blood groups.
- B** They have different eye colour and different shaped ears.
- C** They have the same eye colour but have different weights.
- D** They have the same blood group but have different eye colour.
- 3 Cystic fibrosis is an inherited disease caused by a recessive allele. The allele for cystic fibrosis is represented by *c*. The dominant healthy allele is represented by *C*.

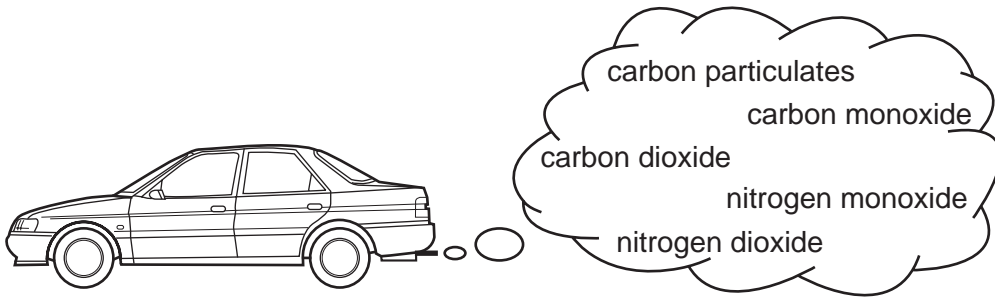
The table shows the alleles possessed by the parents of a child.

| | | | |
|--------|----------|----------|----------|
| | | mother | |
| | | <i>c</i> | <i>c</i> |
| father | <i>C</i> | | |
| | <i>c</i> | | |

What is the risk of their child being a **carrier** of cystic fibrosis?

- A** 25% **B** 50% **C** 75% **D** 100%
- 4 Cystic fibrosis often results in death at a young age because several organs are weakened.
- What is the best explanation of how the organs are affected?
- A** The faulty allele causes organs to be blocked with thick mucus.
- B** The faulty allele causes the fibres in muscles to be weakened.
- C** The faulty allele leads to a weakening of the bones.
- D** The faulty allele produces red blood cells which do not carry oxygen.

- 5 The diagram shows some pollutants produced in a car engine.



Which pollutants are produced by incomplete combustion?

- A carbon dioxide and nitrogen monoxide
 - B carbon monoxide and nitrogen dioxide
 - C carbon particulates and carbon monoxide
 - D carbon particulates, carbon monoxide and carbon dioxide
- 6 How are carbon particulates removed from the air?
- A They are used by plants for photosynthesis.
 - B They dissolve in the sea.
 - C They form a solid deposit on surfaces.
 - D They react with rainwater and oxygen to form acid rain.

The following information should be used for questions 7 and 8.

Liz uses an electronic sensor to test the percentage of carbon monoxide in the exhaust gases of a car.

She repeats the test five times.

The table shows the results.

| test | percentage of carbon monoxide in % |
|------|------------------------------------|
| 1 | 0.12 |
| 2 | 0.03 |
| 3 | 0.04 |
| 4 | 0.03 |
| 5 | 0.02 |

7 Liz treats test 1 as an outlier.

Why does she do this?

- A The first test was just a rough trial.
- B The result does not agree with the best estimate.
- C The test result is higher than the mean of the other results.
- D The test result lies well outside of the range of the other results.

8 Liz uses her results to calculate the best estimate of the percentage of carbon monoxide in the car exhaust.

What is the value of the best estimate?

- A 0.02% B 0.03% C 0.04% D 0.048%

9 Japan is a series of islands.

It has many volcanoes and experiences many earthquakes.

What does this suggest?

- A The islands are in the middle of the mantle.
- B The islands are on the edge of tectonic plates.
- C The islands were created when an asteroid crashed on Earth.
- D The islands were formed from clouds of dust and gas.

10 Astronomers recently discovered a new planet orbiting a distant star.

They published their initial observations in a peer reviewed scientific journal.

Why is it important to publish in this way?

- A It shows the astronomers are right.
- B The journal only contains articles about astronomy.
- C So other astronomers can try and repeat the findings.
- D To explain their findings to the general public.

11 South America and South Africa are separated by a large ocean.

Fossils of *Mesosaurus*, an ancient reptile, have been found in South America and in South Africa.

Scientists think that this is evidence that

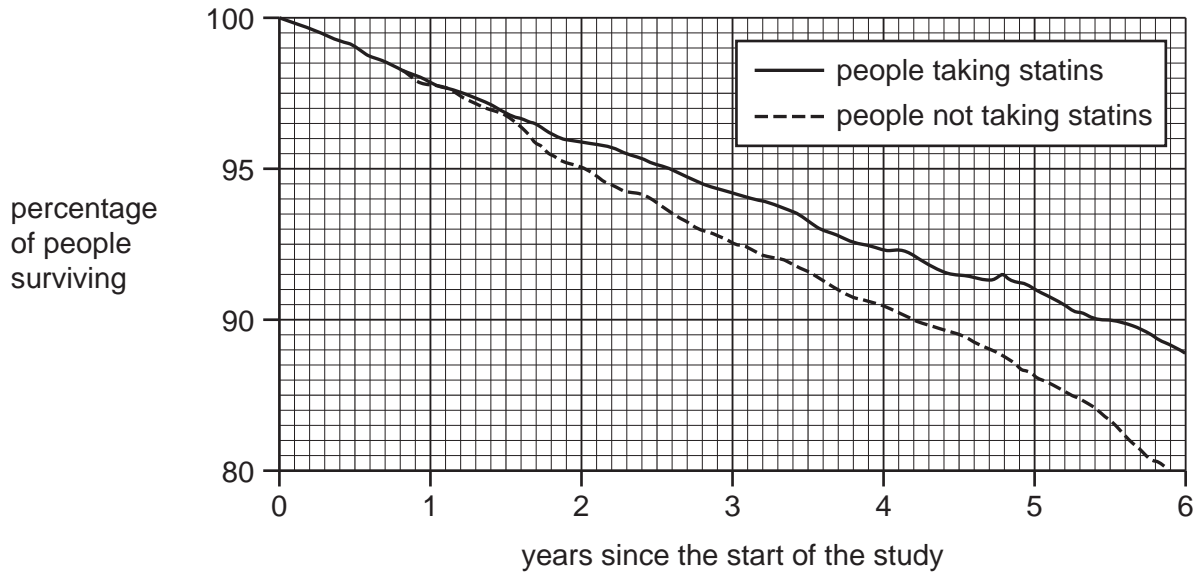
- A life evolved differently in South America and South Africa.
- B *Mesosaurus* was able to swim large distances.
- C South America and South Africa were once part of the same land mass.
- D all the fossils in South America and South Africa must be the same.

12 Which objects in the solar system travel the greatest distance from the Sun?

- A asteroids
- B comets
- C moons
- D planets

13 Scientists think that a type of drug called statins might help prevent heart disease.

The graph shows the results of a drug trial.



Which conclusion can be made from the results?

- A All the people who took statins survived six years.
- B People do not get heart disease if they take statins.
- C People who took statins lived longer on average.
- D There is no difference in the death rate of the two groups.

14 What causes influenza?

- A a bacterium
- B a fungus
- C a toxin
- D a virus

15 How does the body's immune system attack microorganisms?

- A Red blood cells make antibodies.
- B Red blood cells make antibiotics.
- C White blood cells make antibodies.
- D White blood cells make antibiotics.

- 16** Blood is carried away from the heart in arteries and back to the heart in veins.

The pressure of the blood in arteries is much higher than in veins.

Which features of veins are correct?

- A** thick walls and no valves
 - B** thick walls and valves
 - C** thin walls and no valves
 - D** thin walls and valves
- 17** Anand is shopping for a new winter coat. He knows that natural and synthetic materials can be used to make coats.

Which material is synthetic?

- A** cotton
 - B** nylon
 - C** silk
 - D** wool
- 18** Joshua and his friends are going on a climbing holiday. Joshua buys a new rope before he goes.

The rope is made of nylon fibres.

What is the most important property of the fibres?

- A** density
- B** hardness
- C** tensile strength
- D** stiffness

19 Poly(ethene) is made from molecules of ethene.

The diagram shows a molecule of ethene.



key



carbon atom



hydrogen atom

500 ethene molecules join to make a single poly(ethene) molecule.

Which row in the table shows the correct number of atoms of carbon and hydrogen in this molecule?

| | number of carbon atoms | number of hydrogen atoms |
|----------|------------------------|--------------------------|
| A | 2 | 4 |
| B | 500 | 1000 |
| C | 1000 | 1000 |
| D | 1000 | 2000 |

20 What is the name of the process that happens when ethene molecules join to make poly(ethene)?

- A** petrochemical
- B** polymerisation
- C** cross linking
- D** polymer modification

21 Which polymer, **A**, **B**, **C** or **D**, has the largest forces between its molecules?

| | melting temperature in °C | use |
|----------|---------------------------|-----------------------|
| A | 160 | drinking cups |
| B | 115 | carrier bags |
| C | 500 | pan handles |
| D | 90 | stretch wrap for food |

22 Jack looks at a web page on a computer screen.

Which statement correctly describes the processes that are happening?

- A The air reflects light which is emitted by the screen.
- B The air transmits light which is emitted by the eye.
- C The screen absorbs light which is reflected by the eye.
- D The screen emits light which is transmitted by the air.

23 Which electromagnetic radiation is ionising?

- A microwave
- B radio
- C visible light
- D X-ray

24 Susie sunbathes on the beach.

Her mum tells her to put on sun cream.

Why does she do this?

- A It will block the microwave radiation.
- B It will block the ultraviolet radiation.
- C It will keep water away from her skin.
- D It will stop her from getting too hot.

25 The Maldives are a series of low lying islands in the Indian Ocean.

The government of the Maldives is one of the most active in promoting measures to limit global warming.

Which statement best explains why?

- A Global warming is due to the increase in carbon dioxide in the atmosphere.
- B Global warming is likely to cause sea levels to rise.
- C Global warming is likely to cause the temperature in all parts of the world to increase.
- D Global warming is likely to increase the number of earthquakes.

The following information should be used for questions **26** and **27**.

A scientist investigates why snails that live on different mountains have different coloured shells.

He makes the following statements.

1. The snails move very slowly.
2. The snails 'fight' for resources.
3. Many of the snails are eaten by birds.
4. Natural selection has happened.

26 Which word can be used to describe the snail's behaviour in statement 2?

- A** biodiversity
- B** competition
- C** evolution
- D** variation

27 Which statement contains an explanation for why snails that live on different mountains have different coloured shells?

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

28 Many types of insect feed on oak trees. Small birds eat these insects and larger birds eat the small birds.

How does the energy enter this food web?

- A** as carbon dioxide
- B** as food in the soil
- C** as rain
- D** as sunlight

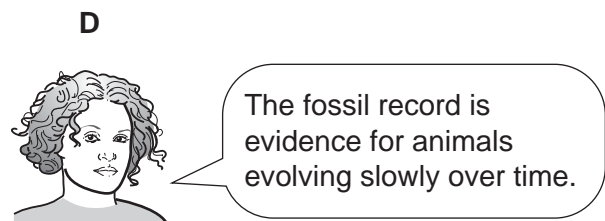
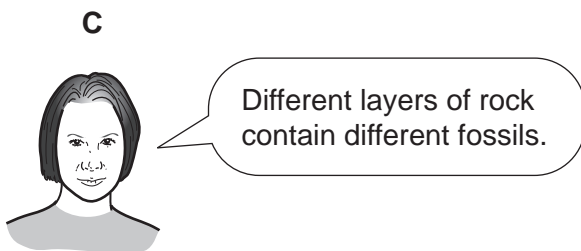
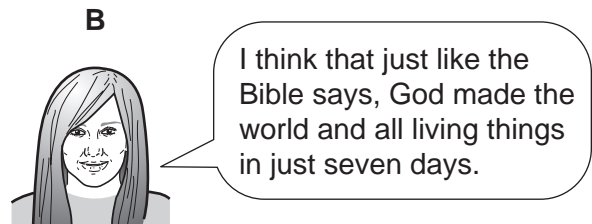
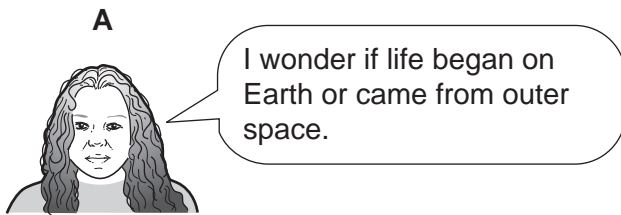
29 Farmers want to produce chickens that lay as many eggs as possible.

What is the process they may use to do this?

- A** divergence
- B** genetic testing
- C** natural selection
- D** selective breeding

30 Different people have different views about the origin of life on Earth and evolution.

Which person is making a statement that contains only **data**?



31 Scientists studying human evolution make predictions. Other scientists later make observations that may or may not agree with the original predictions.

Which statement about human evolution describes an observation that **agrees** with a prediction?

- A** A scientist thought that *Homo habilis* evolved from *Australopithecus afarensis* but only fossils of a common ancestor have been found.
- B** Fossils have been found that link *Homo habilis* with *Homo erectus* just as early scientists thought.
- C** Fossils show that *Homo habilis* became extinct around 1.5 million years ago, which is later than scientists originally thought.
- D** *Homo sapiens* is now found in Europe, Africa, Asia and America, but was originally found only in Africa.

32 Which element in fertilisers is most important for plant growth?

- A** carbon
- B** hydrogen
- C** nitrogen
- D** oxygen

33 Which list contains parts of the body that are all made from mainly protein?

- A fat, teeth, nerves
- B muscles, tears, bones
- C tendons, skin, blood haemoglobin
- D vitamins, water, hair

34 Eve and Clare both have jobs that involve making cakes.

They talk about the ingredients they use.



Eve

I bake cakes to sell in my own local shop. I use all natural, fresh ingredients.

I bake cakes to sell in supermarkets. I add antioxidants and preservatives to my cakes.



Clare

Why do Eve and Clare need to use different ingredients?

- A By law, food sold in supermarkets must contain artificial additives.
- B Cakes sold locally do not need to be transported or stored for long periods.
- C Supermarket cakes need to contain more additives because they always contain more sugar and fat.
- D Supermarkets do not use natural ingredients in their foods.

35 Why are antioxidants and preservatives added to foods?

| | reason for adding antioxidant | reason for adding preservatives |
|----------|--|---|
| A | to stop fats and oils in the food from reacting with oxygen | to stop the growth of harmful microbes in the food |
| B | to stop oil and water in the food from separating | to keep the nutrient content in food from deteriorating |
| C | to stop fats and oils in the food from reacting with oxygen | to keep vitamin levels high in the food |
| D | to stop sugar in the food from reacting with oxygen in the air | to stop the growth of harmful microbes in the food |

36 Which is an example of a secondary energy source?

- A coal
- B electricity
- C nuclear fuel
- D wind

37 A scientist places a radiation detector near a small piece of americium-241 and notes that the count rate is 42 counts per minute.

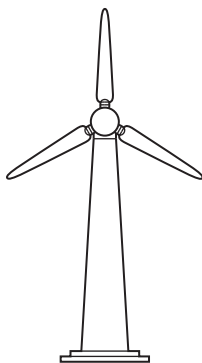
What would reduce the count rate?

- A heating the piece of americium
- B grinding the americium into a powder
- C placing the radiation detector at a greater distance
- D reacting the americium with oxygen to form americium oxide

38 There are many different types of power station.

Each changes energy from one form to another.

One type of renewable energy is a wind turbine.



Which row shows the energy transfers in coal fired power stations and in wind turbines?

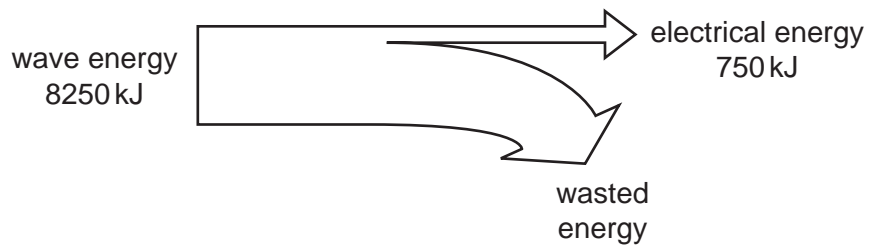
| | coal fired power stations | wind turbines |
|----------|---------------------------|-----------------------|
| A | chemical → electrical | electrical → chemical |
| B | chemical → electrical | kinetic → electrical |
| C | electrical → chemical | electrical → kinetic |
| D | kinetic → chemical | kinetic → electrical |

39 Statements about four different types of power station are given below.

Which statement is most likely to be about a coal burning power station?

- A may damage local wildlife e.g. birds
- B needs hills or mountains
- C produces carbon dioxide
- D produces radioactive waste

40 This is the Sankey diagram for a generator that uses wave energy to make electricity.



What is the amount of energy wasted?

- A 150 kJ
- B 900 kJ
- C 7500 kJ
- D 9000 kJ

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