



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

www.PapaCambridge.com

TWENTY FIRST CENTURY SCIENCE (CORE)

0608/01

Paper 1 Multiple Choice

October/November 2010

1 hour

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

* 2 4 6 9 9 7 1 4 9 8 *

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 **14** printed pages and **2** blank pages.



- 1 *Staphylococcus* is a type of bacteria that often grows on the body surface.

It only causes problems if it gets into the bloodstream. The bacteria can then be killed by a tablet containing a drug.

Which type of drug is the tablet likely to contain?

- A an antibiotic
 - B an antibody
 - C a disinfectant
 - D a vaccine
- 2 A new resistant strain of *Staphylococcus* bacteria has now appeared.

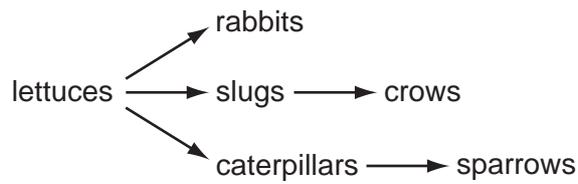
Which action would help stop resistant strains of bacteria appearing?

- A Allow people to buy the drug without a prescription.
 - B Always complete the dose of the drug.
 - C Give the drug to everybody to stop the bacteria spreading.
 - D Stop taking the drug as soon as you feel better.
- 3 Scientists think that all life on Earth developed from molecules.

Which properties did these molecules have?

- A the ability to breakdown other molecules
- B the ability to copy themselves
- C the ability to resist strong acids
- D the ability to survive very high temperatures

- 4 The diagram shows some food chains in a garden.

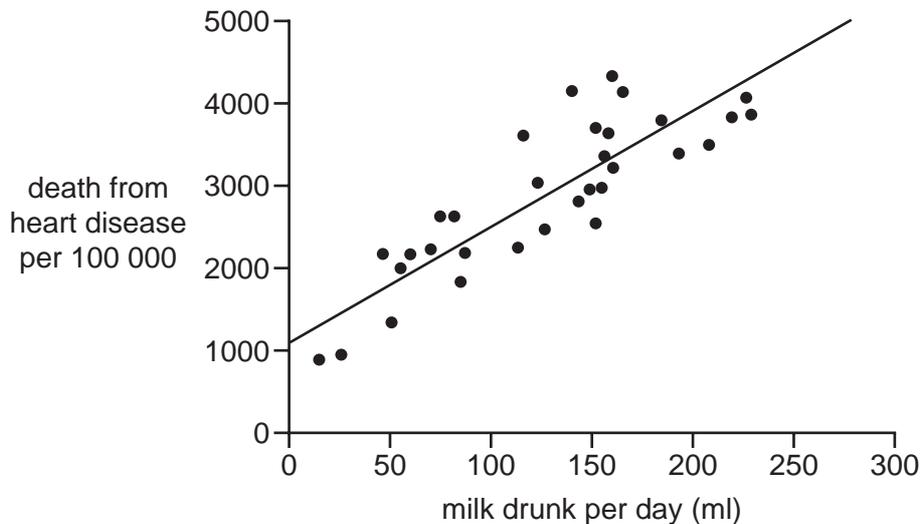


A gardener uses chemicals in his garden to kill all the slugs.

Which is **most** likely to happen?

- A The numbers of rabbits went down.
 - B The number of sparrows went down.
 - C The number of crows went down.
 - D The number of lettuces increased.
- 5 A scientist wanted to see if there was a link between the amount of milk people drink and their chance of dying from heart disease.

He looked up death rates from heart disease for many different countries and how much milk people drank in each country. He plotted his data on a graph.

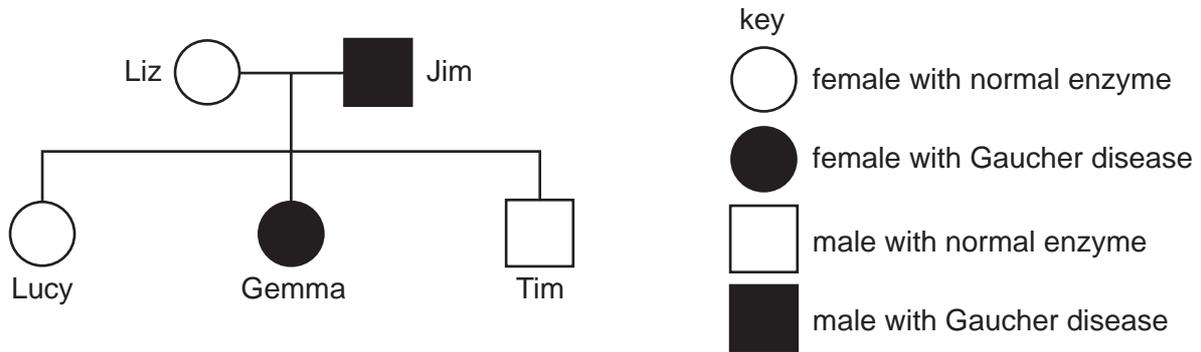


Which conclusion can be made from the scientist's data?

- A Drinking large amounts of milk causes heart disease.
- B Drinking milk gives some protection from heart disease.
- C There does not seem to be any link between the amount of milk drunk and the chance of having heart disease.
- D There is a correlation between the amount of milk drunk and the number of people dying of heart disease.

- 6 Gaucher disease is a genetic condition caused by a recessive allele.

The diagram is part of a family tree showing some individuals that have Gaucher disease.



Which individuals are carriers for Gaucher disease?

- A Gemma and Jim
 - B Liz and Jim
 - C Liz, Lucy and Tim
 - D Tim, Gemma and Lucy
- 7 In people with Gaucher disease, fat builds up in the body and stops many organs from working properly.

The most likely explanation for this is that the gene affected codes for

- A an enzyme that breaks down fat.
 - B DNA.
 - C fat.
 - D sugar that is converted to fat.
- 8 When fossil fuels burn, particles of carbon are released into the air.
- Four people are talking about what happens to the particles of carbon.
- Which person gives the correct explanation for what happens to the carbon particles?
- A 'Carbon particles are used up by plants.'
 - B 'The particles dissolve in the rain.'
 - C 'The particles settle on buildings.'
 - D 'They are a gas so they just float away.'

- 9 Liz works in a garage. One of her jobs is to check the amount of carbon monoxide in the exhaust emissions.

How does carbon monoxide form?

- A Impurities in the petrol burn to form carbon monoxide.
 - B Sunlight causes exhaust gases to react together as they leave the car.
 - C The high temperature of the engine causes gases in the air to react together.
 - D There is not enough oxygen in the car engine for the fuel to burn completely.
- 10 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/%
1	0.12
2	0.03
3	0.04
4	0.03
5	0.02

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.
- 11 Liz uses her results to calculate the best estimate of the concentration 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

- 12 Poly(ethene) used to wrap food has a plasticiser added to it.

How does the plasticiser change the properties of the poly(ethene)?

- A** It goes a darker colour.
B It has a higher melting point.
C It is harder and stronger.
D It is softer and more flexible.
- 13 A shop uses poly(ethene) bags. The owner of the shop is thinking about starting to use paper bags.

The table shows some information about each type of bag.

Which row shows why the Life Cycle Assessment is different for each type of bag?

	poly(ethene) bag	paper bag
A	made from crude oil	made from trees
B	stretches when pulled hard	breaks when pulled hard
C	transparent	opaque
D	used for the last 50 years	used for hundreds of years

- 14 The table shows the melting temperature of three polymers.

polymer	melting temperature / °C
1	115
2	120
3	140

Which polymers are solid at 130 °C?

- A** 1, 2 and 3
B 1 and 2 only
C 3 only
D none

- 15 Which statement suggests that asteroids could be hazardous?
- A All asteroids are in stable orbits around the Sun, between Mars and Jupiter.
 - B An asteroid hitting the ocean would cause a tsunami.
 - C There are many more small asteroids than large asteroids.
 - D There is less chance of the Earth being hit by a large asteroid than a small asteroid.
- 16 What is the correct increasing order of size for the Earth, the Milky Way galaxy and the Sun?
- A Earth → Milky Way galaxy → Sun
 - B Earth → Sun → Milky Way galaxy
 - C Milky Way galaxy → Earth → Sun
 - D Sun → Earth → Milky Way galaxy
- 17 Sunlight is needed by plants to provide energy for photosynthesis.

Which gas is removed from the atmosphere by photosynthesis?

- A carbon dioxide
 - B methane
 - C oxygen
 - D ozone
- 18 The table shows some information about people who have contact with the radioactive sources in a hospital.

doctor	decides on use of sources
radiographer	prepares and uses sources
nurse	helps patients treated with sources
porter	moves patients and sources around hospital

If not specially protected, who is **most** likely to receive the largest radiation dose over a year?

- A doctor
- B radiographer
- C nurse
- D porter

19 What did the Sun start its life as?

- A a cloud of gas
- B a galaxy
- C a planet
- D a white dwarf

20 Which statement best describes visible light?

- A Light is a microwave.
- B Light is a type of electromagnetic radiation.
- C Light is ionising radiation.
- D Light is radiation produced by radioactive sources.

21 The Sun produces a lot of ultraviolet radiation. The Earth's atmosphere blocks most of this ultraviolet radiation.

Which gas in the atmosphere absorbs most of the ultraviolet radiation?

- A carbon dioxide
- B methane
- C nitrogen
- D ozone

The following information should be used to answer questions **22** and **23**.

A scientist looked at tree snails on different mountains in Hawaii. He noticed that the snails that lived on different mountains had different coloured shells.

He made four statements about the snails.

- 1 Snails are often born with different coloured shells.
- 2 The snails are 'fighting' for resources.
- 3 Many of the snails are eaten by birds.
- 4 Natural selection produced different results on different mountains.

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

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

23 Each of the four statements contains data or is an explanation.

Which statement contains an explanation for the different coloured snails on different mountainsides?

- A 1 B 2 C 3 D 4

24 Which is the best definition of 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.

25 Charles Darwin visited many islands over a hundred years ago. He noticed that on small islands, animals may evolve to produce smaller animals.

These statements use Darwin's ideas to explain how small animals could evolve on an island.

- 1 Animals that are smaller need less food and so are more likely to survive.
- 2 Animals are all born with different genes controlling their size.
- 3 The smaller animals pass on their genes for small size.
- 4 Animals that survive are more likely to reproduce.

What is the correct order of events that could lead to the animals on the island becoming smaller?

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

26 Jane is sitting reading a book.

The door bell rings.

She gets up to answer it.

What are the **effectors** in Jane's response to the door bell?

- A her ears
- B her eyes
- C her glands
- D her muscles

27 *Staphylococcus* is often destroyed on the skin by natural chemicals made by the body.

In which liquid are these chemicals found?

- A blood
- B saliva
- C stomach acid
- D sweat

28 Which product is **not** made from the chemicals in crude oil?

- A fuels
- B lubricants
- C natural fibres
- D poly(ethene)

29 The diagram shows the arrangement of atoms in some molecules.



Which compound is **not** shown in the diagram?

- A CO
- B CO₂
- C H₂O
- D SO₂

30 The diagram shows the atoms in a molecule found in living things.



key

- carbon
- hydrogen
- oxygen
- nitrogen

What is the name of this type of molecule?

- A amino acid
- B carbohydrate
- C hydrocarbon
- D polymer

The following information should be used to answer questions 31 and 32.

Eve has a fridge magnet that shows the healthy amounts of sugar, fat and salt in food.

Check the LABELS!

	What's a little? (per 100 g)	What's a lot? (per 100 g)
sugar	2 g	10 g
fat	3 g	20 g
salt	0.3 g	1.5 g

She looks at the label on a packet of Krunchy Crisps.

	per 100 g
energy	2190 kJ
sugar	2.5 g
fat	33.0 g
salt	1.9 g

Use the fridge magnet and label to decide if the crisps are high or low in sugar, fat or salt.

31 Which statement is correct?

- A The crisps are high in fat and salt but not sugar.
- B The crisps are high in sugar, fat and salt.
- C The crisps are low in salt.
- D The crisps are very low in sugar.

32 Eve knows that she cannot assess the risk of eating Krunchy Crisps, to her health, using only this information.

Which statement shows why she **cannot** assess the risk?

- A Other brands of crisps have different amounts of sugar, fat and salt.
- B She does not know the outcome of eating too much sugar, fat and salt.
- C She might be eating other foods that are high in sugar, fat and salt.
- D There are other factors in Eve's life to consider.

33 Eve reads an article that says eating too much fat can increase the risk of getting heart disease. She knows that her grandmother eats lots of fatty foods but has a very healthy heart. Which statement explains this?

- A Eve's grandmother eats lots of fat and sugar too.
- B Eve's grandmother may get heart disease in the future.
- C Smoking is also a cause of heart disease.
- D The article is making a correlation between groups of people.

34 Some food additives are approved by Food Agencies.

Which statement about food additives is **not** correct?

- A All approved additives have passed a safety test.
- B Fresh food without additives is always safer.
- C Some additives increase the storage life of foods.
- D Some approved additives may cause health problems.

The following information should be used to answer questions 35 and 36.

Kelly and Tunde are discussing the plan to build a nuclear power station near where they live.

I don't want the power station. It might replace 2 or 3 coal power stations or 500 wind turbines but it would put tourists off from visiting our excellent beach.



Kelly

I think we should have the power station, as we need more electricity. But I think the nuclear waste is a problem that we need to spend more money on to make it safe, because nuclear power is the most reliable.



Tunde

35 Who made a comment about power output?

- A Kelly
- B Tunde
- C both Kelly and Tunde
- D neither Kelly nor Tunde

36 Who made a comment about economic cost?

- A Kelly
- B Tunde
- C both Kelly and Tunde
- D neither Kelly nor Tunde

37 Which statement about microwaves is **not** correct?

- A Microwaves can cause water molecules to vibrate.
- B Microwaves produce ions in living cells.
- C The energy in microwaves is carried as photons.
- D The intensity of microwaves decreases as the distance from the source increases.

38 A scientist thinks that mountains must be forming all the time.

She uses some of the statements below in her explanation.

- 1 Mountains are part of the Earth's crust.
- 2 Erosion causes mountains to be worn down.
- 3 The Earth is older than the oldest rocks.
- 4 If no new mountains are formed, the world would be flat.
- 5 Mountains exist today.
- 6 Mountains are only formed on drifting continents.

Which statements make up an explanation for mountains forming all the time?

- A 1, 3 and 6 B 2, 4 and 5 C 3, 4 and 6 D 4, 5 and 6

39 Radiations from radioactive sources have different powers of penetration.

What is the order of penetration for alpha, beta and gamma radiation?

	most	→	least
A	alpha	beta	gamma
B	alpha	gamma	beta
C	beta	gamma	alpha
D	gamma	beta	alpha

40 How is the energy produced by a nuclear fuel?

- A The fuel captures sunlight energy.
- B The fuel is burnt.
- C The fuel produces tides.
- D The nucleus of a fuel atom changes.

