



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

**TWENTY FIRST CENTURY SCIENCE (CORE)**

**0608/01**

Paper 1 Multiple Choice

**October/November 2011**

**1 hour**

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

\* 6 1 8 3 2 1 7 8 1 1 \*

**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.

The following information should be used for questions 1, 2 and 3.

Lucy is expecting a baby.

1 A doctor tests one of the embryo's cells to find out its sex.

In which part of the cell are the genes?

- A cell membrane
- B chloroplast
- C cytoplasm
- D nucleus

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

- A XY
- B XXY
- C XX
- D YY

3 Some pregnant women only want to have a baby if it is a particular sex.

Four people think terminating a pregnancy is wrong.

Which person thinks terminations are ethically wrong?

A



Terminating babies because of their sex is wrong because it can lead to an imbalance in the population.

B



I think that terminations are wrong because they can lead to physical problems for the mother.

C



I think that the tests that are used to provide information for terminations are not very reliable.

D



I think that terminations should never be allowed because they are killing a potential life.

- 4 One of the molecules in petrol is heptane. Heptane is a hydrocarbon.

When heptane burns completely in air, it reacts with oxygen.

What forms when heptane burns?

- A carbon dioxide and water
  - B nitrogen and carbon dioxide
  - C water and hydrogen
  - D water and nitrogen dioxide
- 5 Coal burning power stations produce sulfur dioxide,  $\text{SO}_2$ .

Sulfur dioxide reacts with two substances in the air to form acid rain.

What are the names of these two substances?

- A carbon dioxide and oxygen
  - B carbon dioxide and water
  - C nitrogen and oxygen
  - D oxygen and water
- 6 The manager of a factory is worried about the air quality around the factory.

He talks to the workers about travelling to work by bus.

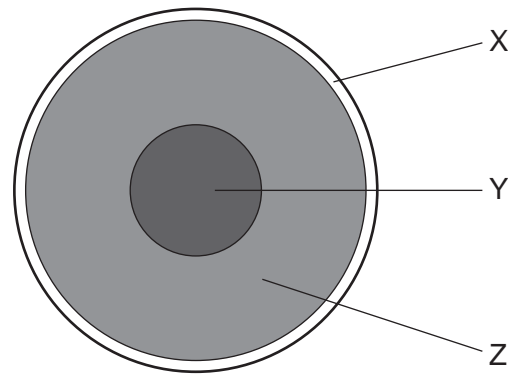
“The air quality near the factory is poor when everyone is travelling to work. If everyone used the bus instead of travelling by car the air quality around the factory would improve.”

Why would travelling by bus improve the air quality?

- A Everyone would arrive at the same time.
- B Many cars are used by people travelling to work.
- C One bus produces less pollutants than one car.
- D The bus would make more journeys per day than each car.

4

7 The diagram shows a section through the Earth.



What are the correct labels for X, Y and Z?

	X	Y	Z
<b>A</b>	core	mantle	crust
<b>B</b>	crust	core	mantle
<b>C</b>	crust	mantle	core
<b>D</b>	mantle	core	crust

8 Which one of the following is only found **outside** our solar system?

- A** asteroid
- B** comet
- C** galaxy
- D** moon

9 What is a light year?

- A** The distance light travels in a year.
- B** The speed of light for a year.
- C** The time it takes for light to go around the Sun.
- D** The total light that reaches the Earth in a year.

10 The table contains a theory and an observation related to the theory.

Which theory is **not** supported by its observation?

	theory	observation
<b>A</b>	The continents of the Earth were once joined together. They have since moved apart.	The seafloor spreads by about 10 cm each year as new rock is produced under the seas.
<b>B</b>	Mountain chains were formed by the surface of the Earth 'wrinkling' as it cooled down long ago.	The height of the mountains in the southern Alps is increasing by around 7 mm each year.
<b>C</b>	The Universe started in a 'big bang'.	All distant galaxies are moving away from Earth.
<b>D</b>	Some mountains are formed from rocks that came from the sea floor.	Fossils of shells are found in rocks at the top of mountains.

11 When Wegener published his theory of continental drift, most other scientists of his time rejected it.

Which reason was used for rejecting Wegener's theory?

- A** different continents seem to fit together
- B** identical fossils are found in Africa and America
- C** no-one could detect movement of the continents
- D** similar rock formations are found on opposite sides of oceans

12 The body has natural barriers that reduce the entry of microorganisms.

Which list contains only natural barriers?

- A** antibiotics, skin and sweat
- B** bandages, skin and tears
- C** stomach acid, sweat and white blood cells
- D** tears, sweat and stomach acid

13 Which system in the body is responsible for destroying microorganisms?

- A the immune system
- B the nervous system
- C the respiratory system
- D the skeletal system

14 The table contains information about different substances that are involved in infections.

Which row contains completely correct information?

	substance	made by	action
A	acid	stomach	makes microorganisms reproduce faster
B	antibiotics	white blood cells	kills microorganisms
C	antibodies	white blood cells	makes blood clot
D	toxins	microorganisms	damages body cells

15 Which statement explains why drugs are tested on humans?

- A The drugs are tested on healthy people to see if they work.
- B The drugs are tested on healthy people to see what dose may cause death.
- C The drugs are tested on ill people to find out how much the drug should cost.
- D The drugs are tested on people with the illness to see if the drug works.

16 Gary wants to know if he is likely to get heart disease.

Which fact is most likely to **increase** the risk of him getting heart disease?

- A He eats plenty of fruit.
- B He has a glass of wine twice a week.
- C He likes to swim regularly.
- D He smokes 20 cigarettes a day.

17 The table shows the properties of three different materials.

material	cost	heat insulation	melting point / °C	strength
low density poly(ethene) (LDPE)	low	poor	80	low
high density poly(ethene) (HDPE)	high	poor	180	high
polystyrene	medium	good	240	low

The manager of a fast food restaurant wants to use one of the materials to make boxes for hot food.

He chooses to use polystyrene.

Why is polystyrene the best choice?

- A It has a high melting point and is very strong.
- B It is the cheapest and the strongest.
- C It is the best heat insulator and has the highest melting point.
- D It is the most expensive and it has a low strength.

18 Natural rubber is a polymer.

Reacting the rubber with sulfur makes it harder.

Which statement gives the most likely explanation for the rubber becoming harder?

- A Strong bonds form between the polymer chains.
- B The chains of rubber move apart.
- C The melting point gets lower.
- D The polymer chains get shorter.

The following information should be used for questions 19 and 20.

Rose and Jane test the breaking strength of a length of nylon fibre.

19 The table shows Rose's results.

test number	1	2	3	4	5
weight to break fibre / N	0.60	1.45	0.90	1.35	0.70

What is the range of Rose's results?

- A 0.60 N to 0.70 N
  - B 0.60 N to 1.35 N
  - C 0.60 N to 1.45 N
  - D 1 N to 5 N
- 20 Jane does the same tests on another piece of the same nylon fibre.

The table shows Jane's results.

test number	1	2	3	4	5
weight to break fibre / N	0.95	0.80	0.90	1.00	0.85

Jane and Rose decide to use Jane's results to work out the best estimate of the strength of fibre.

Why do they decide to use Jane's results?

- A Jane's results are closer together than Rose's results.
- B Jane's results are higher than Rose's results.
- C None of Jane's results are higher than 1.00.
- D None of Rose's results were the same.



- 21** A scientist does a life cycle assessment for a type of plastic packaging.

The assessment shows that the waste plastic packaging should be burned rather than buried in a landfill site.

Some people do not agree with the scientist.

Which statement gives the best argument in favour of burying waste in a landfill site?

- A** Gases from burning the plastics may be toxic.
- B** Space to build new landfill sites is in short supply.
- C** The energy from burning the plastic can be used to generate electricity.
- D** The plastic packaging does not rot away.

- 22** Some shops now use paper carrier bags instead of plastic carrier bags.

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

Which statement gives the best explanation for why the life cycle assessments are different?

- A** Different shops use different types of bag.
- B** Some people prefer to use plastic carrier bags.
- C** The bags have different appearances.
- D** The energy use and environmental impact of using the bags are different.

- 23** Which type of radiation is an example of electromagnetic radiation?

- A** alpha
- B** beta
- C** gamma
- D** sound

- 24** Which type of electromagnetic radiation is an ionising radiation?

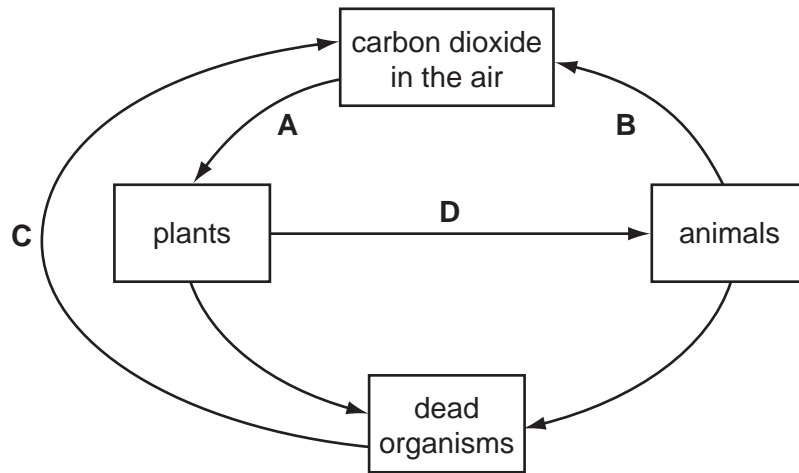
- A** infra red
- B** microwave
- C** ultraviolet
- D** visible light

25 Which statement about carbon dioxide is **not** correct?

- A Carbon dioxide absorbs visible light.
- B Carbon dioxide is a greenhouse gas.
- C Carbon dioxide is present in very small amounts in the atmosphere.
- D Carbon dioxide is removed from the atmosphere by photosynthesis.

The following information should be used to answer questions 26 and 27.

The diagram shows part of the carbon cycle with some of the processes labelled **A**, **B**, **C** and **D**.



26 Which process, **A**, **B**, **C** or **D**, is respiration?

27 Which process, **A**, **B**, **C** or **D**, is only carried out by microorganisms?

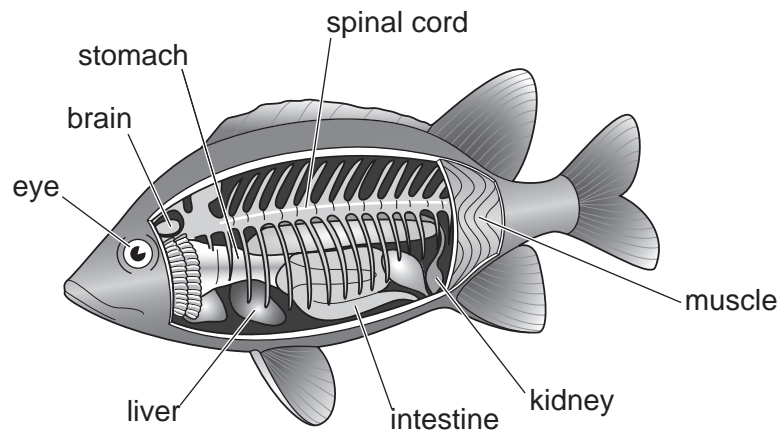
28 The table shows some information about variation.

Which row shows the correct information?

	environment		genes	
	Can it produce variation?	Can this variation be passed on?	Can it produce variation?	Can this variation be passed on?
<b>A</b>	yes	yes	yes	no
<b>B</b>	yes	no	yes	yes
<b>C</b>	no	no	yes	yes
<b>D</b>	no	no	no	no

The information below should be used for questions 29 and 30.

The diagram shows the structure of a fish.



29 Which organ in the fish contains the most receptors?

- A eye
- B kidney
- C liver
- D muscle

30 Which two organs in the fish make up the central nervous system?

- A eye and brain
- B brain and spinal cord
- C spinal cord and muscle
- D stomach and intestine

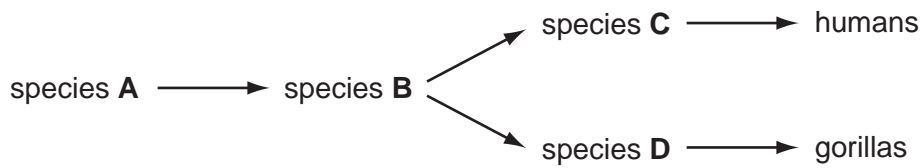
31 Multi-cellular organisms use both nervous and hormonal communication.

Which row shows the correct features of hormonal communication?

	messages travel in	responses are
<b>A</b>	blood	long-lasting
<b>B</b>	blood	short-lived
<b>C</b>	neurones	long-lasting
<b>D</b>	neurones	short-lived

32 The diagram shows how humans and gorillas evolved from a common ancestor.

Which species is the **most recent** common ancestor?



33 The café marron is a species of plant that lives on a small island near Mauritius. It was thought to be extinct.

What does extinct mean?

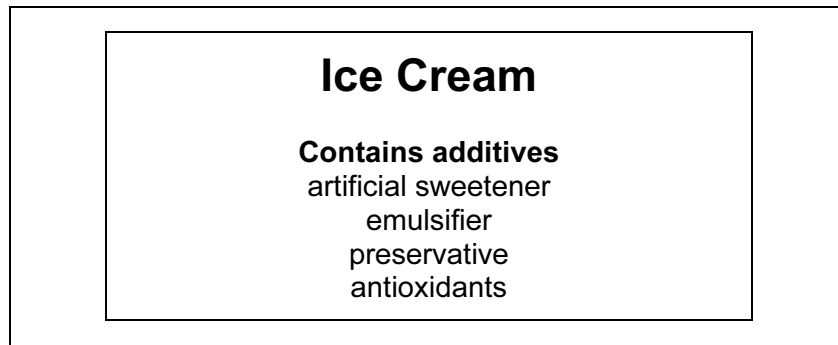
- A The species is endangered.
- B The species is rare.
- C There is no member of the species left alive.
- D The species only lives in places where it cannot be seen.

34 Farmers in developing countries use less synthetic fertiliser than farmers in developed countries.

Which statement describes the best reason for this?

- A Farmers in developing countries do not know about organic farming.
- B Synthetic fertilisers are not as widely available in developing countries.
- C The soil is much less fertile in developing countries.
- D There are not as many pests and diseases in developing countries.

35 The diagram shows a label from a tub of ice cream.



Why are emulsifiers added to food?

- A to mix oil and water in the food together
- B to prevent oxygen in the air reacting with the food
- C to reduce the need for adding sugar
- D to stop the growth of microbes

36 Ann is talking about food colourings.

‘I am very health conscious. I read all the labels of food and avoid eating food colourings.’

Why does Ann avoid eating food colourings?

- A She is cutting down on fat in her diet.
- B She is following a low calorie diet.
- C She is trying to eat less sugar.
- D She thinks some chemical additives may be harmful.

37 The diagram shows a label from a packet of crisps.

<b>Crunchy Crisps</b>	
<b>Typical values</b>	
	per 25 g pack
protein	1.5 g
carbohydrate	12.4 g
fat	8.5 g
salt	0.15 g

Which of the substances is broken down into amino acids by the body?

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

38 A scientist is trying to change the activity of a radioactive source.

Which method will change the radioactivity of the material?

- A dissolving in water
- B heating until the material melts
- C reacting with an acid
- D none of these

39 What is the meaning of 'half-life'?

- A half the time until a radioactive source is safe
- B the time until a radioactive source loses half its activity
- C the time until half a radioactivity experiment is finished
- D the time until there are half the number of protons in the nucleus

40 Which fuel is a renewable energy source?

- A coal
- B oil
- C uranium
- D wood

