OCR
RECOGNISING ACHIEVEMENT

F

GENERAL CERTIFICATE OF SECONDARY EDUCATION
TWENTY FIRST CENTURY SCIENCE
BIOLOGY A

A221/01

Unit 1 Modules B1 B2 B3
(Foundation Tier)

Candidates answer on the question paper
A calculator may be used for this paper

OCR Supplied Materials:
None

Other Materials Required:
- Pencil
- Ruler (cm/mm)

Monday 12 January 2009
Morning

Duration: 40 minutes

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- The total number of marks for this paper is **42**.
- This document consists of **16** pages. Any blank pages are indicated.

FOR EXAMINER'S USE		
Qu.	**Max.**	**Mark**
1	5	
2	4	
3	6	
4	7	
5	2	
6	5	
7	6	
8	4	
9	3	
TOTAL	42	

Answer **all** the questions.

1 Genes affect the way an organism develops.

(a) Where are genes found?

Put a (ring) around the **correct** answer.

cell membrane

vacuole

cytoplasm

nucleus

[1]

(b) Which two statements describe what genes do?

Put ticks (✓) in the boxes next to the **two** correct answers.

speed up chemical reactions in the cell	☐
carry instructions for a cell	☐
store food reserves	☐
code for making proteins	☐
trap sunlight	☐

[2]

(c) Which two statements describe the **structure** of genes?

Put ticks (✓) in the boxes next to the **two** correct answers.

Genes are …

… circular carbohydrate molecules. ☐

… sections of cytoplasm. ☐

… vacuoles that protect the DNA. ☐

… sections of very long DNA molecules. ☐

… structures that make up chromosomes. ☐

[2]

[Total: 5]

2 Stem cells could be useful in treating some diseases.

Cloning of embryos can be used to produce large numbers of stem cells.

Different people have different views about cloning embryos.

Read the views of these people and then answer the following questions.

(a) Which person is stating two different views about cloning embryos?

answer ..... **[1]**

(b) Read the following statement.

Cloning embryos may enable new tissues to be grown to treat diseases.

Which person's view agrees with this statement?

answer ..... **[1]**

(c) Which person supports the view that the right decision is the one that leads to the best outcome for the majority of people involved?

answer ..... **[1]**

(d) Which person is saying that certain actions are never justified because they are unnatural or wrong?

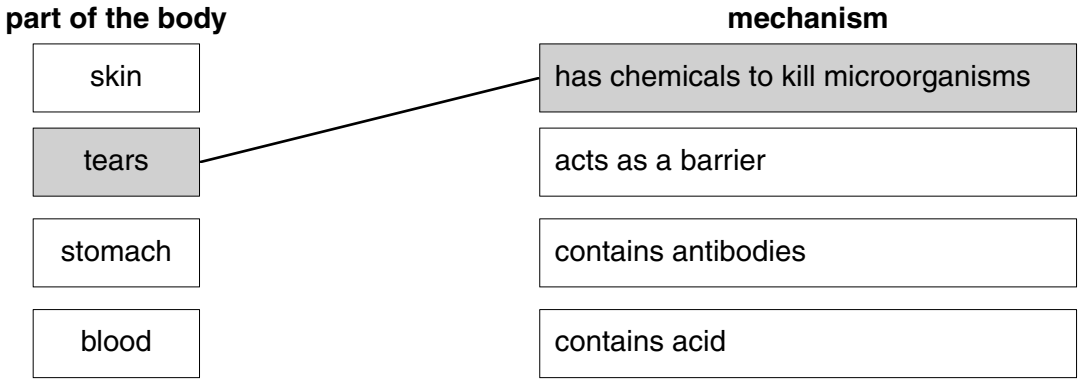
answer ..... **[1]**

[Total: 4]

3 Our bodies resist infection.

(a) Draw a straight line linking the **part of the body** with the **mechanism** it uses to resist infection.

One has been done for you.



[2]

(b) Once inside the body microorganisms can reproduce rapidly.

Which **two** conditions help this to happen?

Put ticks (✓) in the boxes next to the **two** best answers.

Hormones are found in the blood.	☐
Body temperature is 37 °C.	☐
Neurons connect parts of the body together.	☐
The body contains food and water.	☐
Kidneys excrete urea.	☐
The blood contains platelets.	☐

[2]

(c) Diseases caused by microorganisms have symptoms.

Which **two** statements best explain the causes of symptoms?

Put ticks (✓) in the boxes next to the **two** best answers.

microorganisms damage cells	☐
microorganisms cause a low body temperature	☐
drugs taken to cure the disease cause side effects	☐
numbers of antibodies in the blood increase	☐
microorganisms produce toxins	☐
microorganisms consume antibodies	☐

[2]

[Total: 6]

4 Huntington's disorder and cystic fibrosis are examples of genetic disorders.

(a) Draw straight lines linking each **disorder** with its correct **symptom** and the correct **cause**.

symptoms	disorder	cause
difficulty in breathing and digesting foods		one dominant allele of a single gene
high temperature and sweating	Huntington's disorder	two recessive alleles of a single gene
bleeding gums and wounds that will not heal	cystic fibrosis	three recessive alleles of a single gene
falling over, clumsiness and loss of memory		four dominant alleles of a single gene

[4]

(b) The tables show the different combination of alleles that can be inherited for each of the two disorders.

Huntington's disorder		cystic fibrosis	
A	HH	**B**	CC
C	Hh	**D**	Cc
E	hh	**F**	cc

Choose from the combinations to answer the following questions.

(i) Which **one** of the combinations, **A, B, C, D, E** or **F**, is found in a carrier?

answer ..... **[1]**

(ii) Which **two** combinations of alleles, **A B, C, D, E** or **F**, could be found in people who cannot pass the disorder on to their children?

answer ..... and .....**[2]**

[Total: 7]

5 Vaccines help keep us healthy.

(a) Which of the statements about a vaccine is true?

Put a tick (✓) in the box next to the **correct** answer.

A vaccine is …

… a safe form of the disease-causing microorganism. ☐

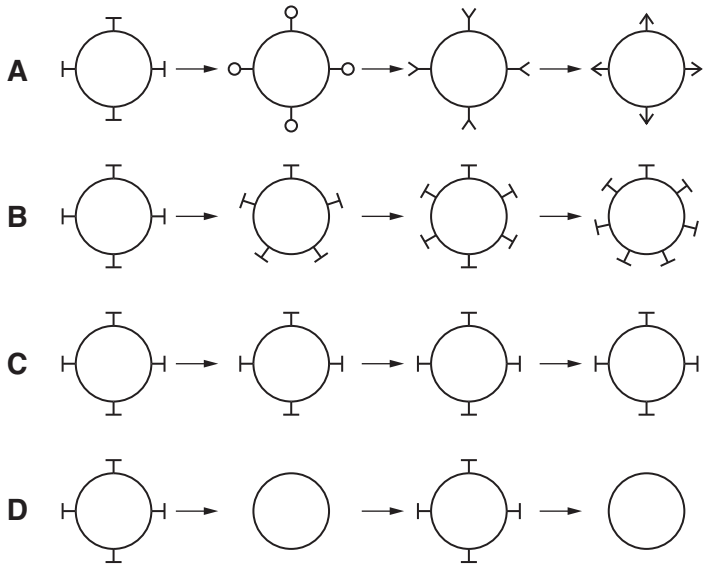
… a medicine that cures the disease. ☐

… a small amount of all the different vitamins. ☐

… a collection of white blood cells. ☐

[1]

(b) Look at the diagrams of the influenza virus. They show how the virus changes over a period of time.



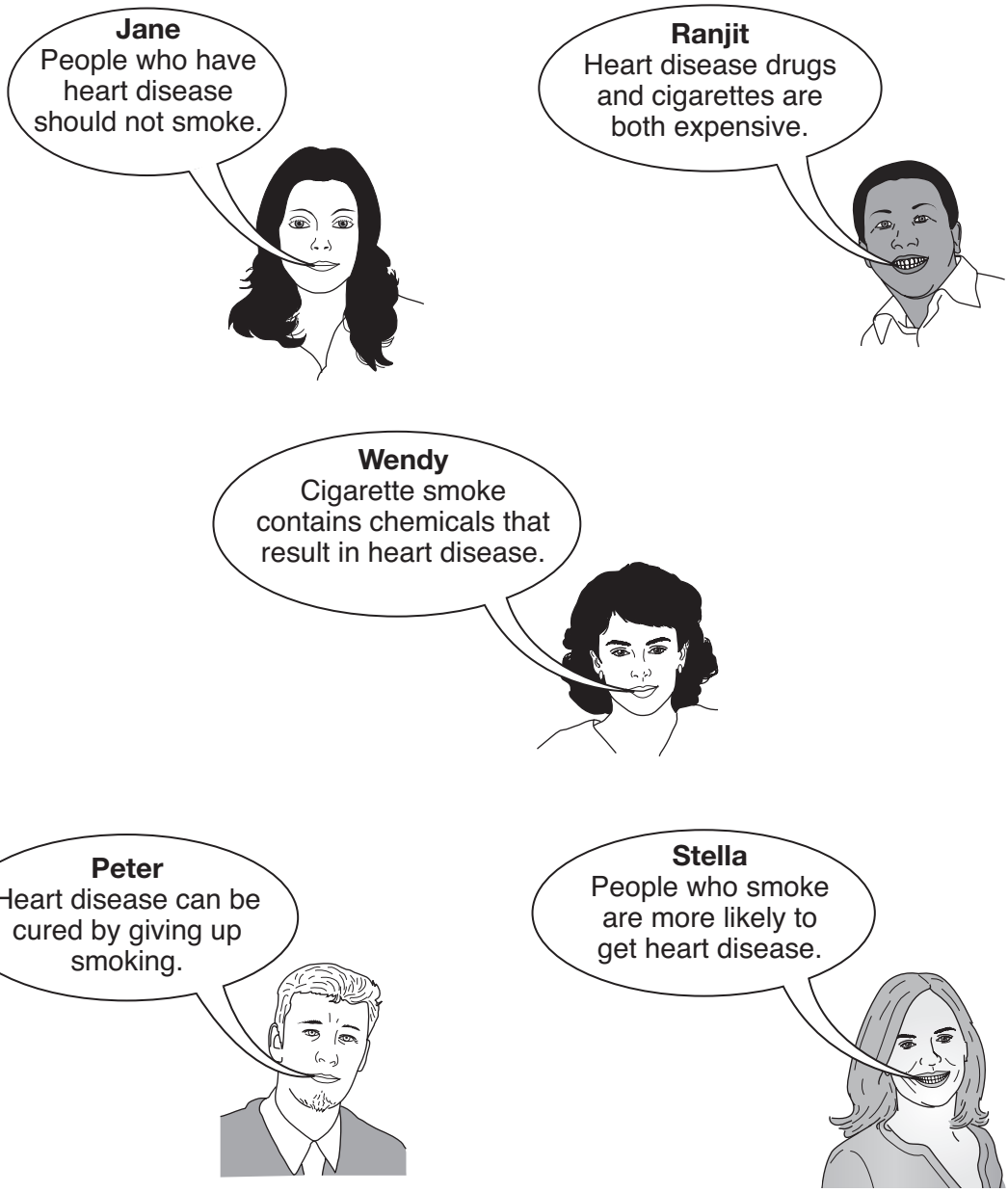
New influenza vaccines have to be developed every year.
Which of the diagrams, **A, B, C,** or **D,** shows why?

answer ..... **[1]**

[Total: 2]

6 Read the statements about cigarette smoking.

(a)



(i) Which person is describing a **cause**?

answer ..... **[1]**

(ii) Which person is describing a **correlation**?

answer ..... **[1]**

(b) Which of the following is an example of a correlation between a factor and an outcome?

Put a tick (✓) in the box next to the **correct** answer.

It is cold at the North Pole. ☐

Ice cream sales increase in hot weather. ☐

The average temperature in the summer is 22 °C. ☐

Ice cream can be made in different flavours. ☐

[1]

(c) Which of the following does **not** provide convincing evidence for a correlation?

Put a tick (✓) in the box next to the **best** answer.

Rain is more likely to fall on days that are most cloudy. ☐

People who eat lots of food are more likely to be overweight. ☐

John caught a cold when visiting Mary in hospital. ☐

Babies vaccinated with MMR are less likely to get measles. ☐

[1]

(d) Which of the following life style factors is **not** likely to increase the risk of getting heart disease?

Put a tick (✓) in the box next to the **best** answer.

taking very little exercise ☐

smoking cigarettes ☐

eating too much fatty food ☐

playing too much football ☐

[1]

[Total: 5]

7 Most scientists believe that life on Earth today exists because of evolution.

(a) Look at the statements about how variation may be caused.

A only by genes

B by both genes and the environment

C by neither genes or the environment

D only by the environment

(i) Which statement **A, B, C** or **D** states the cause of variation in all living things?

answer ..... **[1]**

(ii) Which statement **A, B, C** or **D** describes how variation is passed on to the next generation?

answer ..... **[1]**

(b) Natural selection and selective breeding can both produce changes in organisms. Draw straight lines to link each **change** with its correct **cause**.

cause	change	cause
	increasing milk yield in dairy cows	
	increasing antibiotic resistance in bacteria	
natural selection	producing larger eggs from chickens	selective breeding
	getting leaner meat from pigs	
	development of camouflage in zebras	

[3]

(c) Look at the statements about evolution.

Which statement explains how evolution by natural selection could have produced different results?

Put a tick (✓) in the box next to the **best** answer.

if conditions on Earth had been slightly different from what they actually were	☐
if a slightly shorter time had been available for evolution to happen	☐
if a slightly longer time had been available for evolution to happen	☐
if conditions on Earth were the same as they actually were	☐

[1]

[Total: 6]

8 Humans use both hormonal and nervous communication.

(a) Look at the different examples that involve communication.

A dropping a hot object

B controlling the blood's sugar level

C changes at puberty

D transmitting information from the eye to the brain

Complete the table by using the letters **A**, **B**, **C** and **D**.

hormonal communication	nervous communication

[2]

(b) Use the words to complete the sentences.

You may use the words only once.

chemical **electrical** **fast** **slow**

Hormones are ..... messengers that travel in the blood and bring about ..... acting responses.

Nerves use ..... impulses and bring about ..... acting responses.

[2]

[Total: 4]

9 Many different species live on planet Earth. Their survival depends upon various factors.

(a) Which factors affect their survival?

Put ticks (✓) next to the **two** best answers.

environment	☐
other species	☐
continental drift	☐
age of the Earth	☐

[2]

(b) Which statement is **most** likely to bring about the extinction of a species?

Put a tick (✓) in the box next to the **best** answer.

building a dam to create a reservoir	☐
building a new town	☐
reducing the amount of fossil fuels burnt	☐
destroying the rain forest to get timber	☐

[1]

[Total: 3]

END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE