OCR
RECOGNISING ACHIEVEMENT

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A222/01

GENERAL CERTIFICATE OF SECONDARY EDUCATION
TWENTY FIRST CENTURY SCIENCE
BIOLOGY A
Unit 2 Modules B4 B5 B6 (Foundation Tier)

WEDNESDAY 23 JANUARY 2008

Afternoon
Time: 40 minutes

Candidates answer on the question paper.
Additional materials (enclosed):
None

Calculators may be used.
Additional materials: Pencil
Ruler (cm/mm)

CUP/T42369

Candidate Forename		Candidate Surname	
Centre Number		Candidate Number	

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or 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.
- Do **not** write outside the box bordering each page.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **42**.

FOR EXAMINER'S USE		
Qu.	Max.	Mark
1	11	
2	6	
3	8	
4	6	
5	8	
6	3	
TOTAL	42	

This document consists of **12** printed pages.

[Turn over

Answer **all** the questions.

1 This question is about keeping things inside the body the same.

(a) Which word means **maintenance of a constant internal environment**?

Put a tick (✓) in the correct box.

homeopathy	☐
homeostasis	☐
homogenised	☐
homologous	☐

[1]

(b) Which **two** are examples of conditions inside the body that need to be kept constant?

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

body temperature	☐
hair growth	☐
water and salt balance	☐

[1]

(c) Which **two** activities are most likely to affect the maintenance of a constant internal environment?

Put ticks (✓) in the **two** most correct boxes.

sitting reading a book	☐
sleeping	☐
running a marathon	☐
watching the television	☐
camping in winter	☐

[2]

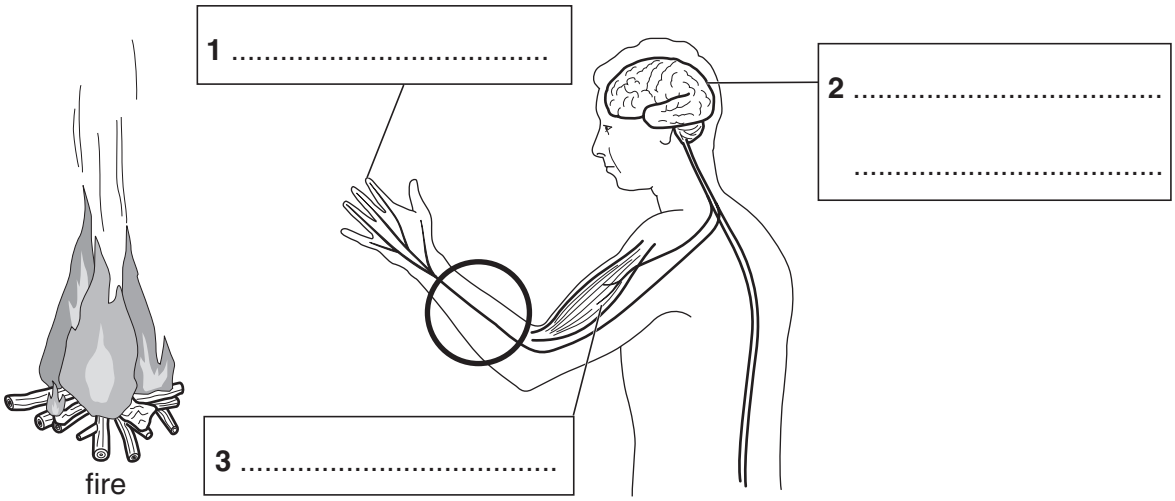
(d) The following diagram shows parts of the human body involved in controlling our body temperature.

Ian puts out his hand to feel the heat from a fire.

(i) Add labels to the boxes, **1**, **2** and **3**, to identify the parts involved.

Choose from this list.

effector **processing centre** **receptor** **synapse**



[3]

(ii) Draw an arrow in the circle to show the direction the nerve impulse travels. [1]

(iii) An animal responds to a stimulus.

Which of the following methods could be used to investigate this?

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

gossip	☐
internet	☐
rumours	☐
experiment	☐
library	☐
dreams	☐
argument	☐

[3]

[Total: 11]

2 This question is about processes in cells.

(a) Which statement **best** describes osmosis?

Put a tick (✓) in the correct box.

movement of molecules from a region of high concentration to a region of low concentration	☐
movement of water molecules from a dilute to a more concentrated solution through a partially permeable membrane	☐
movement of molecules from a region of low concentration to a region of high concentration	☐
movement of water molecules from a concentrated to a more dilute solution through a partially permeable membrane	☐

[1]

(b) Look at the examples of diffusion and osmosis in an animal cell.

Put a **d** in the boxes next to the examples of diffusion.

Put an **o** in the boxes next to the examples of osmosis.

carbon dioxide moving out of a cell	☐
water moving into a cell	☐
oxygen moving into a cell	☐
water moving out of a cell	☐
digested food moving into a cell	☐

[3]

(c) Enzymes are found in cells.

Which **one** of the following must remain constant for enzymes to work at their optimum?

Put a (ring) around the correct answer.

number of cells **size of cell** **temperature of cell** **shape of cell**

[1]

(d) Which condition will increase the rate of reaction of enzymes?

Put a tick (✓) in the correct box.

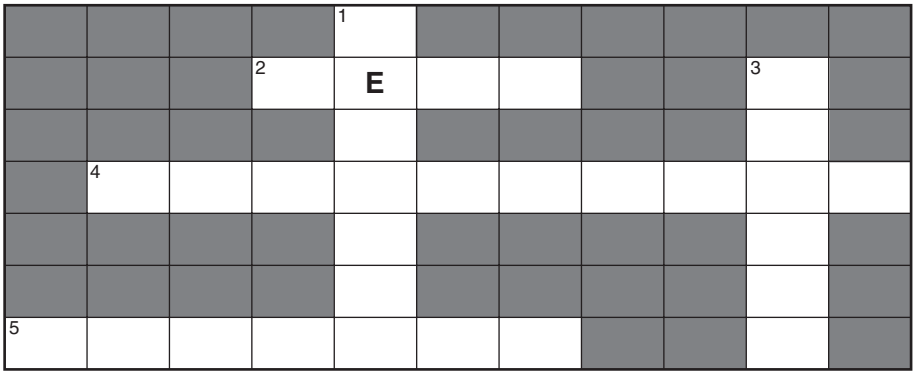
fewer collisions between enzymes and other molecules	☐
faster collisions between enzymes and other molecules	☐
slower collisions between enzymes and other molecules	☐
rapid changes of temperature	☐

[1]

[Total: 6]

3 This question is about how organisms produce more cells.

(a) Use the clues to complete the crossword puzzle.



Across

2 A section of DNA that codes for one protein

4 A long strand of DNA found in the nucleus of a cell

5 A type of cell division that produces identical copies of the cell

Down

1 A type of cell division that produces a sex cell with half the number of chromosomes

3 Another name for a sex cell

[5]

(b) The statements describe how organisms produce new cells.
They are in the wrong order.

A The copies of chromosomes separate.

B The number of organelles in the cell increases.

C The cell divides into two cells.

D Each strand is copied to make two new strands (chromosomes).

E The two strands of each DNA molecule separate.

Put the statements into the correct order. The first one has been done for you.

B				

[3]

[Total: 8]

4 This question is about DNA.

(a) DNA is made from different bases.

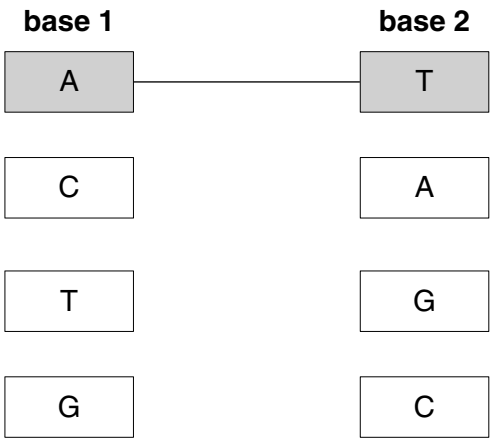
(i) Put a ring around the correct number of different bases found in DNA.

2 **4** **8** **16**

[1]

(ii) Draw **three** straight lines connecting the different bases in the left hand column with the correct bases in the right hand column to show which bases always pair up.

One has been done for you.



[2]

(b) In humans, the zygote divides by mitosis to form which structure?

Put a ring around the correct answer.

uterus

embryo

ovary

seed

[1]

(c) Which **two** of the statements best describe embryonic stem cells?

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

cells that have not yet become specialised	☐
cells that are found in plant stems	☐
cells that can develop into any other kind of cells	☐
cells that do not develop from an embryo	☐
cells that do not change once they have been produced	☐

[2]

[Total: 6]

5 This is a question about the human nervous system.

(a) Add labels to the boxes, **1**, **2** and **3**, to identify the parts involved.

Choose from this list.

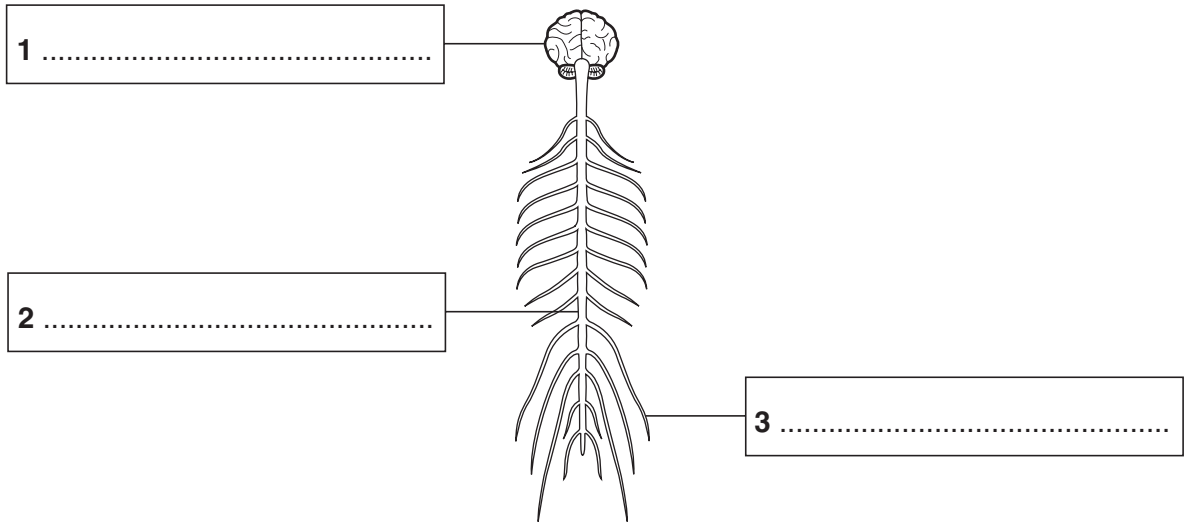
brain

effector

PNS (peripheral nervous system)

spinal cord

synapse



[3]

(b) Some actions controlled by the nervous system are called reflex actions.

Which **two** statements are examples of reflex actions?

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

working out a maths problem	☐
deciding what to eat	☐
pupils in the eyes closing in bright light	☐
new born baby gripping a parent's finger	☐
thinking about your last holiday	☐

[2]

(c) Human beings have the ability to learn.

This involves memory.

Which statement **best** describes memory?

Put a tick (✓) in the correct box.

reflex arc	☐
storage and retrieval of information	☐
response to a stimulus	☐
mapping the different regions of the brain	☐

[1]

(d) Verbal memory can be divided into long and short term memory.

The statements, **A**, **B**, **C**, **D** and **E**, are examples of either short term or long term memory.

Put the letter of each statement into the correct column in the table.

A using a phone number from a telephone directory

B remembering your address

C using a shopping list

D knowing your science teacher's name

E knowing whether you are male or female

long term memory	short term memory

[2]

[Total: 8]

6 This question is about how drugs affect the nervous system.

Neurons are separated by small gaps called synapses.

Drugs taken into the body are carried by the blood stream to the synapses where they have their effect.

The statements describe how this happens.
They are in the wrong order.

A drugs are carried by the blood around the body

B person experiences the effect of the drugs

C drugs then affect transmission of impulses across the synapse

D drugs are taken into the body

E drugs reach the synapse

Put the statements into the correct order. The first one has been done for you.

D				

[3]

[Total: 3]

END OF QUESTION PAPER