Write your name here

Surname	Other names

Pearson Edexcel
International GCSE

Centre Number | | | | | |

Candidate Number | | | | |

Human Biology

Unit: 4HB0
Paper: 01

Tuesday 6 January 2015 – Morning
Time: 2 hours

Paper Reference
4HB0/01

You must have:
Ruler
Candidates may use a calculator.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Show all the steps in any calculations and state the units.

Information

- The total mark for this paper is 120.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Write your answers neatly and in good English.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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1/1/1/1/1/

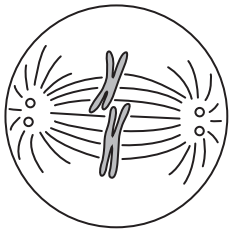
P 4 4 2 5 2 A 0 1 2 8

PEARSON

Answer ALL questions.

1 For each of the questions (a) to (j), choose an answer **A**, **B**, **C** or **D** and put a cross in the box ☒. Mark only one answer for each question. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

(a) The diagram shows stages in the process of mitosis.



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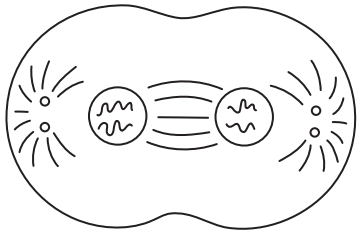

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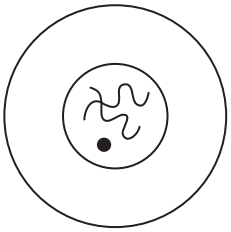


3

4

Which is the correct order of these stages?

(1)

☒ **A** 1 2 3 4

☒ **B** 3 1 4 2

☒ **C** 4 3 2 1

☒ **D** 2 4 1 3

(b) The source of energy for a food chain is

(1)

- ☒ **A** sunlight
- ☒ **B** photosynthesis
- ☒ **C** respiration
- ☒ **D** green plants

(c) Muscles are attached to bones by

(1)

- ☒ **A** ligaments
- ☒ **B** synovial capsule
- ☒ **C** cartilage
- ☒ **D** tendons

(d) During aerobic respiration

(1)

- ☒ **A** glucose combines with carbon dioxide to release energy
- ☒ **B** oxygen is exchanged for carbon dioxide in the lungs
- ☒ **C** glucose is broken down to release energy
- ☒ **D** muscles produce lactic acid

(e) One advantage of having stereoscopic vision is that

(1)

- ☒ **A** distant objects can be focused on the retina
- ☒ **B** colours can be distinguished easily
- ☒ **C** the distance of objects can be judged more accurately
- ☒ **D** objects can be seen more clearly in dim light

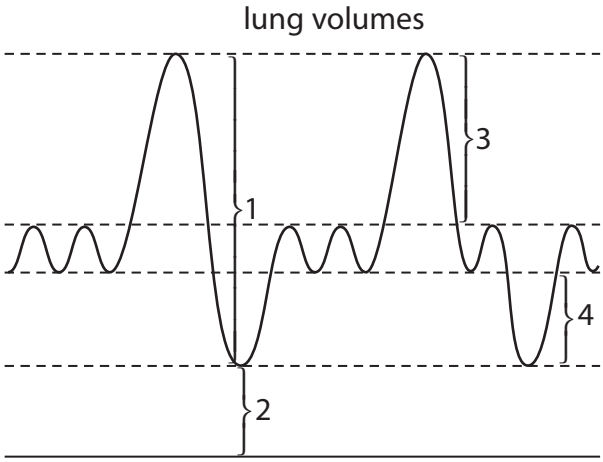
(f) Droplet infection is a method of transferring diseases.

It occurs when the disease is spread by

(1)

- ☒ **A** coughing and sneezing
- ☒ **B** physical contact
- ☒ **C** drinking contaminated water
- ☒ **D** a vector

(g) The diagram shows a spirometer trace of changes in air volume in human lungs during breathing.



Four different volumes are shown on the spirometer trace.

Which change in volume represents the vital capacity?

(1)

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

(h) During a reflex action the response to a stimulus is carried out by

(1)

- ☒ **A** a receptor
- ☒ **B** an effector
- ☒ **C** a sensory neurone
- ☒ **D** a motor neurone

(i) Which vitamin can be made by the action of sunlight on human skin?

(1)

- ☒ **A** vitamin A
- ☒ **B** vitamin B
- ☒ **C** vitamin C
- ☒ **D** vitamin D

(j) In humans, **meiosis** takes place in the

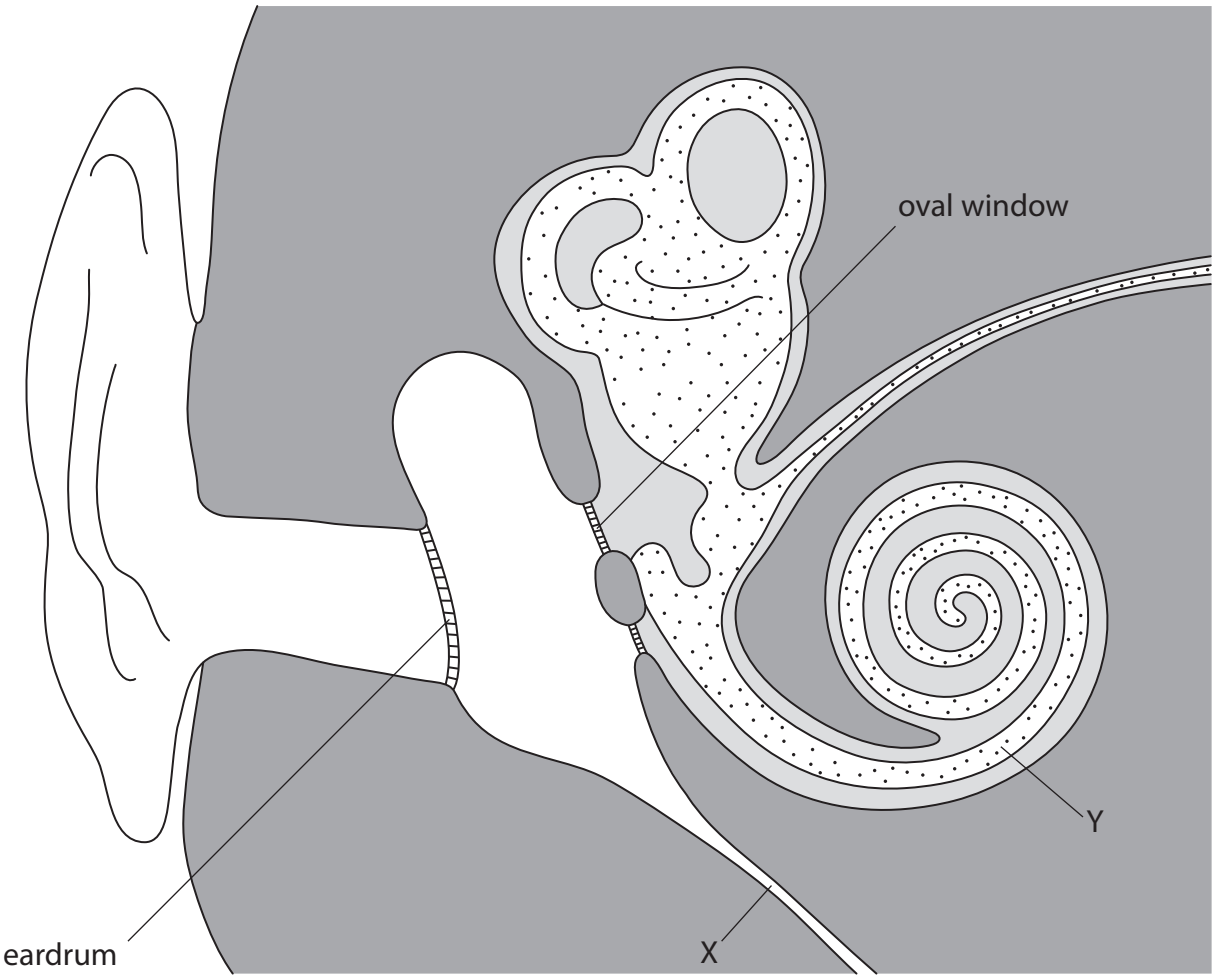
(1)

- ☒ **A** uterus
- ☒ **B** penis
- ☒ **C** testis
- ☒ **D** urethra

(Total for Question 1 = 10 marks)

2 The diagram shows a section through the ear.

The ear ossicles (bones) are not shown.



(a) (i) Complete the diagram by drawing the ear ossicles and labelling them with their correct names.

(3)

(ii) Describe the function of the ear ossicles.

(2)

(b) The structures labelled X and Y are tubes.

(i) State what is contained in tube X and tube Y.

(2)

tube X .....

tube Y .....

(ii) Explain the functions of tubes X and Y in the process of hearing.

(4)

X .....

Y .....

(Total for Question 2 = 11 marks)

3 The box contains a list of food substances.

Use words from the list in the box to complete the table to link each description with the correct food substance.

You may use each word once, more than once or not at all.

(7)

glucose	lipid	cellulose	glycogen	salt
protein	starch	fatty acids		

Description of food substance	Food substance
contains carbon, hydrogen, oxygen and nitrogen	
plant fibre that cannot be digested by humans	
its digestion starts in the mouth	
it is stored in the liver	
it is essential for growth	
in high amounts it can lead to high blood pressure	
it gives a positive result when the Benedict's test is carried out	

(Total for Question 3 = 7 marks)

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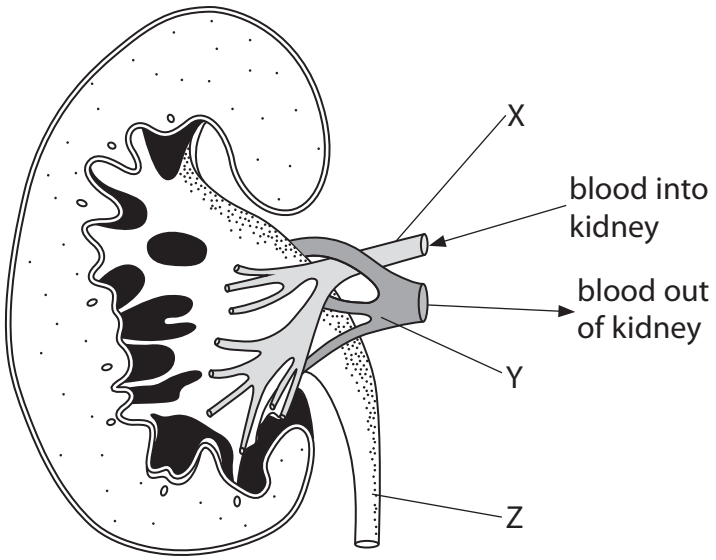
4 The diagram shows a human kidney.



(a) Name the structures X, Y and Z.

(3)

X .....

Y .....

Z .....

(b) A solution passes along structure Z.

(i) Name this solution.

(1)

.....

(ii) Where is this solution stored after passing along structure Z?

(1)

.....

(c) (i) Draw a label line on the diagram to show where blood is filtered in the kidney.

Label this line F.

(1)

(ii) Each kidney is made up of over one million tubules (nephrons).

Explain why the presence of so many tubules is important to the functioning of the kidney.

(4)

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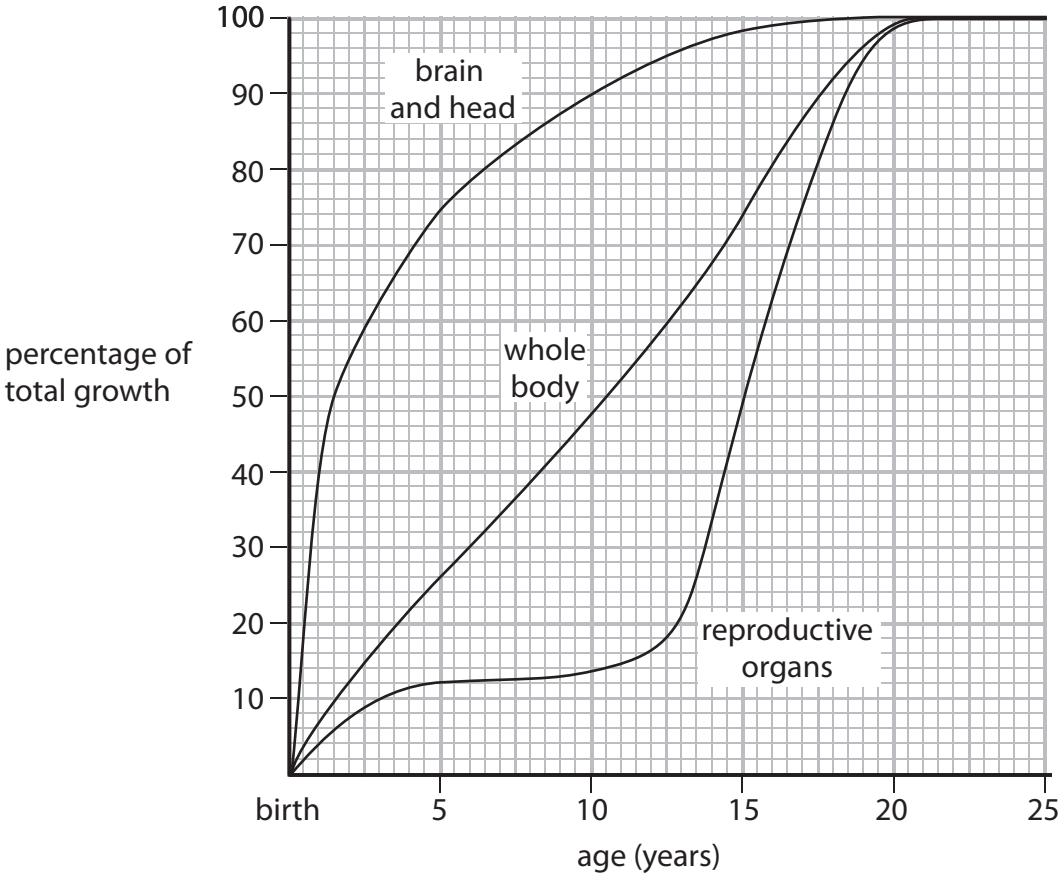
(Total for Question 4 = 10 marks)

5 The graph shows the pattern of growth of different parts of the human body between birth and 25 years of age.



(a) (i) State the percentage of total growth reached by the brain and head at 10 years of age.

(1)

percentage = ... %

(ii) State the percentage of the total growth reached by the whole body at 10 years of age.

(1)

percentage = ... %

(iii) Suggest reasons for the differences between the percentages in part (i) and part (ii).

(2)

.....

.....

.....

.....

(b) (i) Describe the pattern of growth of the reproductive organs from birth to 25 years of age.

(4)

(ii) Explain the pattern of growth described in part (b)(i).

(3)

(Total for Question 5 = 11 marks)

6 An investigation was carried out to measure the resting pulse rates of 30 students.

The figures show the pulse rate for each student in beats per minute.

80	92	75	63	64	74	65	77	72	73
81	83	74	90	90	77	73	81	81	73
62	86	70	67	90	82	81	94	56	83

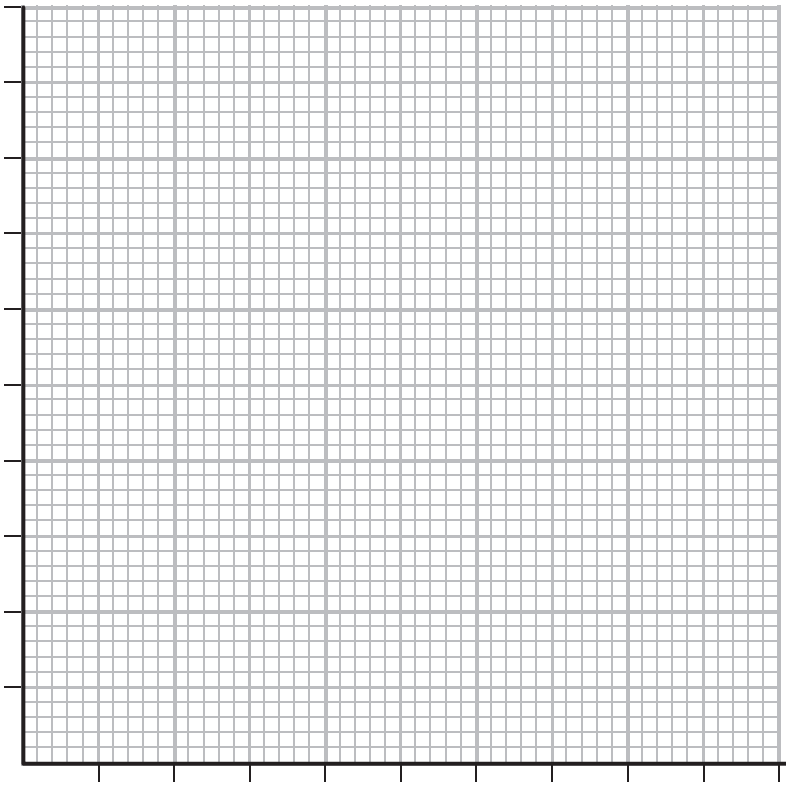
(a) (i) Complete the table to show the number of students in each pulse rate range.

(3)

pulse rate range	56–60	61–65	66–70	71–75	76–80	81–85	86–90	91–95
number of students								

(ii) Use the grid to plot a bar chart of the results of this investigation.

(5)



(b) Describe a method that could be used to obtain the pulse rates of the students.

(5)

(c) If the investigation had been carried out straight after the students had been exercising the results would have been different.

Explain this difference in results.

(5)

(Total for Question 6 = 18 marks)

7 (a) The boxes show seven structures of the human reproductive system and the process that occurs in each structure.

Draw a straight line from each structure linking it to its correct process.

(6)

Structure	Process
fallopian tube	ova are produced
ovary	fertilisation takes place
placenta	sperm cells are produced
seminal vesicle	seminal fluid is produced
testes	oxygen passes to the fetus
uterus	receives penis during intercourse
vagina	the embryo implants

(b) Describe the advantages of breast feeding a baby compared with bottle feeding.

(4)

(Total for Question 7 = 10 marks)

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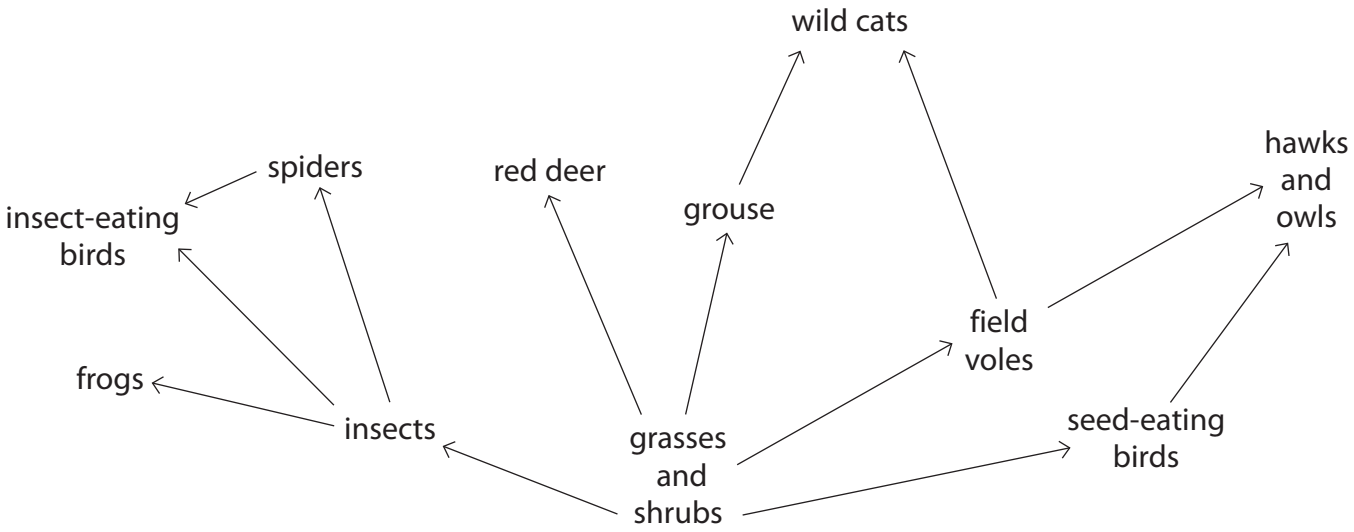
8 The diagram shows a food web.



Use the food web shown in the diagram to answer parts (a) to (f).

(a) Name an organism that can convert light energy into chemical energy.

(1)

.....

(b) Name a primary consumer.

(1)

.....

(c) Name an organism feeding at more than one trophic level.

(1)

.....

(d) Write down a food chain of **four** trophic levels.

(2)

(e) Explain what is shown by the arrows in the diagram of the food web.

(1)

.....

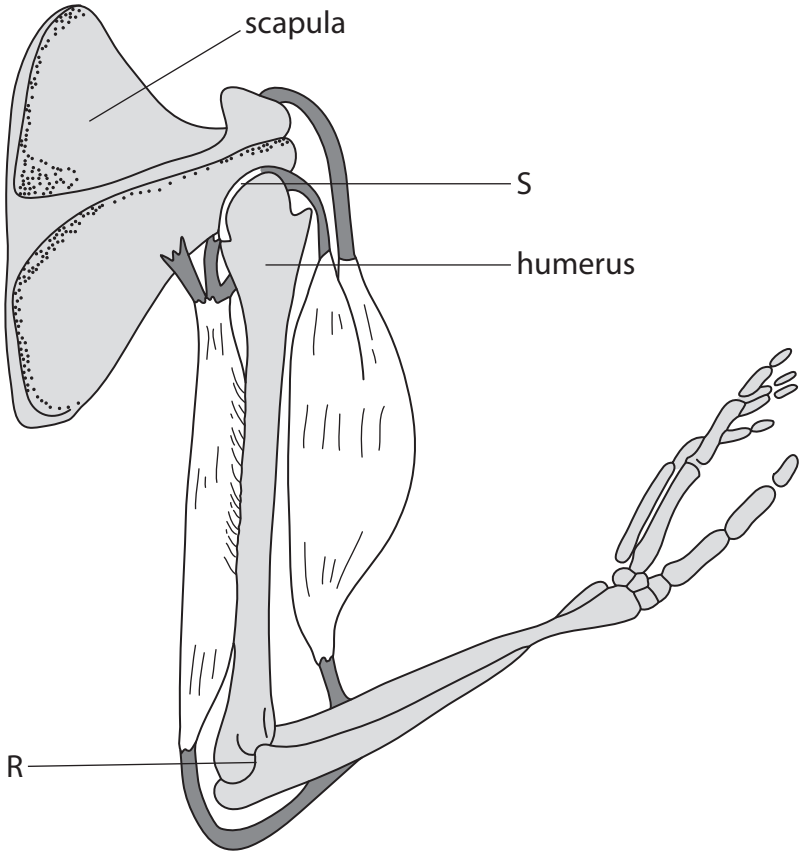
(f) Farmers often spray insecticides on their fields to kill insect pests.

Explain the possible effects of this on the food web in the diagram.

(4)

(Total for Question 8 = 10 marks)

9 The diagram shows the bones and muscles that are used in moving the forearm.



(a) (i) Name the muscle shown in the diagram that pulls the forearm up.

(1)

.....

(ii) Name the muscle shown in the diagram that pulls the forearm down.

(1)

.....

(b) (i) Name the type of joint labelled R and the type of joint labelled S.

(2)

Joint R .....

Joint S .....

(ii) Joints R and S both contain the same fluid.

Name this fluid.

(1)

.....

(iii) Describe the function of the fluid in part (ii).

(1)

.....

(iv) Describe how the movement of joint R differs from the movement of joint S.

(2)

.....

.....

.....

.....

(c) Explain why it is important for the scapula and humerus to remain still while the forearm moves.

(2)

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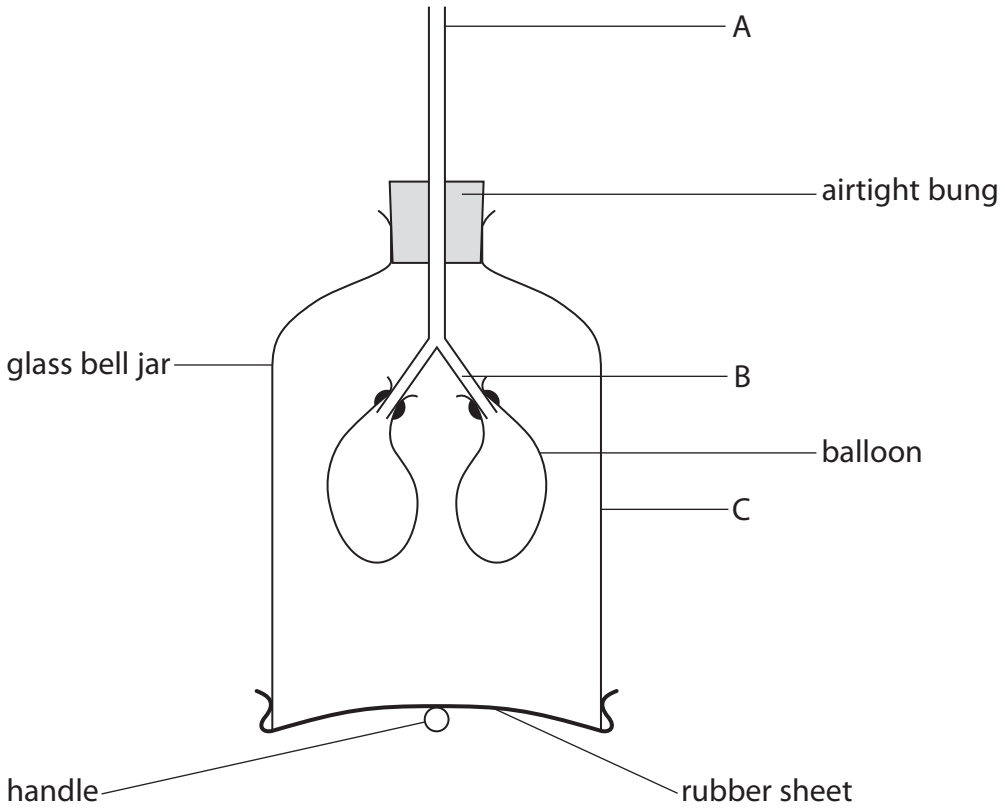
(Total for Question 9 = 10 marks)

10 The diagram shows a piece of apparatus that can be used to demonstrate the breathing-in process.



(a) Name the parts of the human breathing system represented in the apparatus by A, B and C.

(3)

A .....

B .....

C .....

(b) Describe how the apparatus can be used to demonstrate breathing-in.

(2)

.....

.....

.....

.....

(c) Describe one difference between the breathing-in process demonstrated using this apparatus and the breathing-in process of humans.

(2)

.....

.....

(Total for Question 10 = 7 marks)

11 Molecules can pass between cells by diffusion, osmosis or active transport.

(a) Complete the table, which compares these three processes.

(6)

	Diffusion	**Osmosis**	**Active transport**
ATP required (yes/no)			
Direction of movement in relation to concentration gradient			

(b) Explain how temperature affects the rate of diffusion of molecules between cells.

(2)

.....

.....

.....

.....

(Total for Question 11 = 8 marks)

12 The passage is about the process of controlling blood sugar levels.

Complete the passage by writing a suitable word in each of the spaces.

Blood sugar concentration is regulated by ..... feedback

involving hormones secreted by the ..... . The hormone

..... is secreted when reduced blood sugar concentration is

detected.

This hormone causes the blood sugar concentration to return to normal by stimulating

the conversion of glycogen to ..... . This takes

place in the ..... .

If high concentrations of blood sugar are detected, then the hormone

..... is secreted. This returns the blood sugar level to normal

by stimulating the reverse conversion and by stimulating the uptake of

..... into respiring cells.

This whole process of blood sugar control is an example of ..... .

(Total for Question 12 = 8 marks)

TOTAL FOR PAPER = 120 MARKS

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