Candidate Name _____ Centre Numb... ...date

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Joint Examination for the School Certificate and General Certificate of Education Ordinary Level

HUMAN AND SOCIAL BIOLOGY 5096/2

PAPER 2

OCTOBER/NOVEMBER SESSION 2002

2 hours

Additional materials:
Answer paper

TIME 2 hours

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer **three** questions.

Write your answers on the separate answer paper provided.

At the end of the examination,

1. fasten all separate answer paper securely to the question paper;
2. write an **E** (for Either) or an **O** (for Or) next to the number 11 in the grid below to indicate which question you have answered.

INFORMATION FOR CANDIDATES

The intended number of marks is given in brackets [ ] at the end of each question or part question.

You are advised to spend no longer than 1 hour on Section A.

FOR EXAMINER'S USE	
Section A	
Section B	
9	
10	
11	
TOTAL	

This question paper consists of 10 printed pages and 2 blank pages.

Section A

Answer **all** the questions.

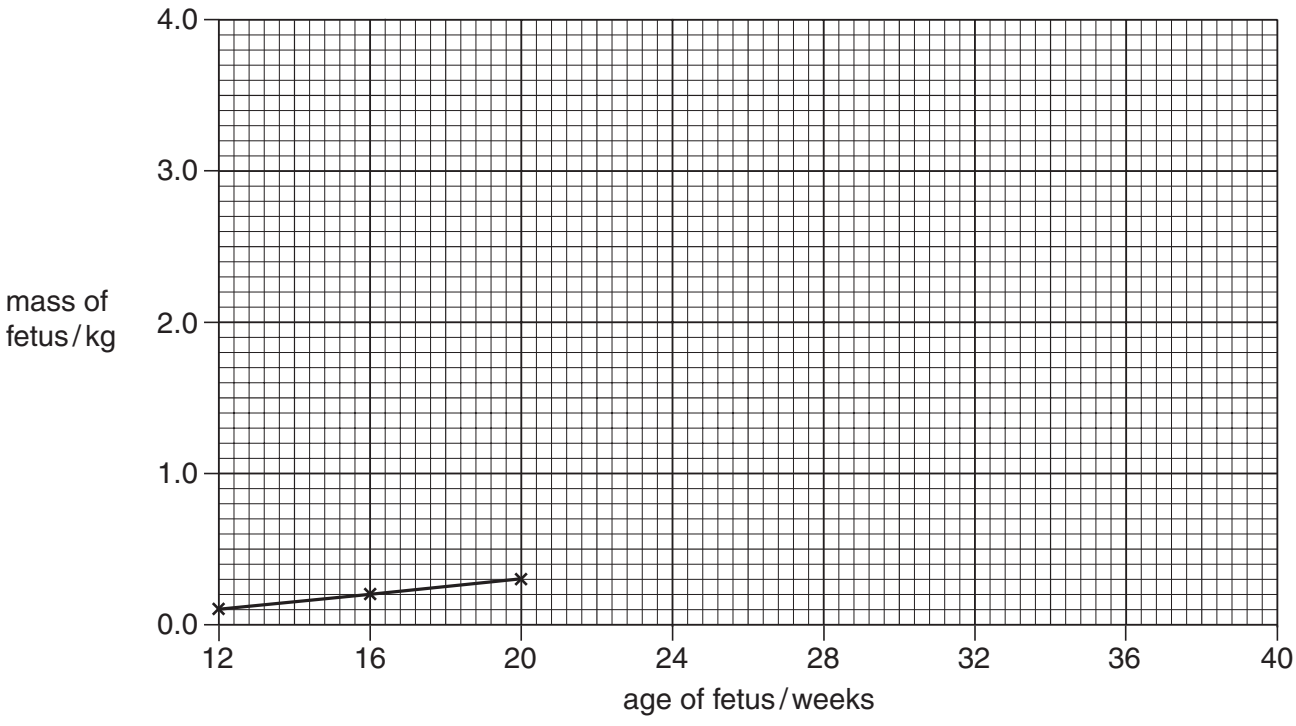
Write your answers in the spaces provided.

1 Table 1.1 shows the increase in mass of a fetus in the last 28 weeks of a pregnancy.

Table 1.1

age of fetus / weeks	mass of fetus / kg
12	0.1
16	0.2
20	0.3
24	0.7
28	1.25
32	1.75
36	2.25
40	3.5

(a) On Fig. 1.1, complete the graph of fetal growth. The first three points have been plotted for you. Join all the points up to make a line on your graph. [6]



(b) Using your graph, state over which period growth is

(i) fastest, *between week* ..... *and week* ..... [1]

(ii) slowest. *between week* ..... *and week* ..... [1]

(c) What was the weight of the fetus at 38 weeks? ..... kg [1]

(d) Add a second line to your graph to show the probable effect on fetal growth if the mother began smoking heavily in week 20 of the pregnancy. Label this line **S**. [3]

(e) Name the fluid that surrounds and cushions the fetus. .....[1]

(f) It is possible to remove some of this fluid during pregnancy and, using a microscope, to examine some of the fetal cells found floating there. If these cells are dividing, tiny rod-like structures are seen in the nuclei.

(i) What are these structures called? .....[1]

(ii) How many are there in a normal fetal nucleus? .....[1]

(iii) How do these structures differ in a male and female fetus?

.....

.....[2]

(g) During birth, which part of the uterus

(i) dilates during the first stage of birth; .....[1]

(ii) contracts strongly during the second stage; .....[1]

(iii) is expelled in the third stage? .....[1]

[Total : 20]

2 Fig. 2.1 shows some of the exchanges taking place between a green plant and its environment.

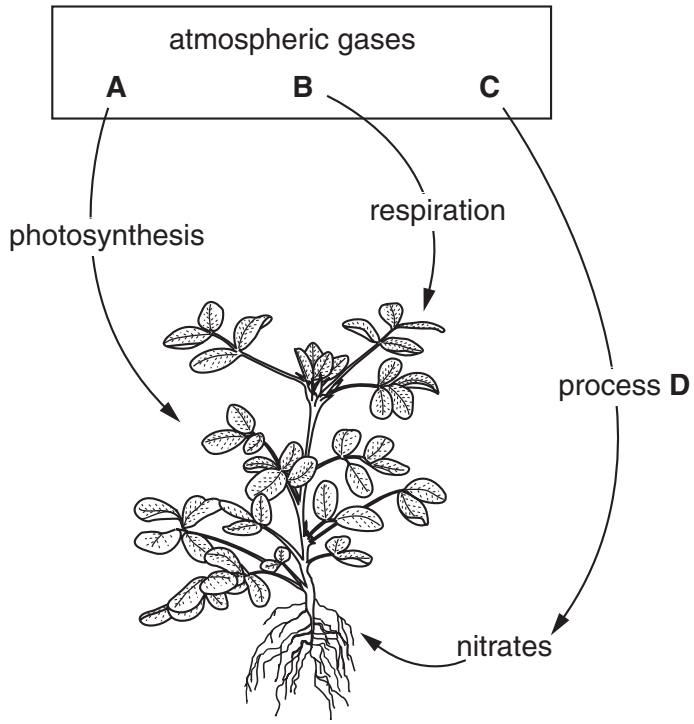


Fig. 2.1

(a) Name gases **A**, **B** and **C**.

A .....

B .....

C ..... [3]

(b) Name process **D**. .....[1]

(c) Which type of organism carries out process **D**?

.....[1]

[Total : 5]

3 Fill in the blanks to complete the description of breathing.

In order to breathe in, the diaphragm muscle and the external intercostal muscles ..... . The volume of the thorax (chest) ..... , while the pressure inside the chest ..... . Since the pressure inside is now ..... than the atmospheric pressure, air flows into the lungs. Forced exhalation, as in blowing up a balloon, requires the contraction of the ..... muscles.

[Total : 5]

4 **(a)** State three **early** signs or symptoms of gonorrhea in a man.

1. .....

2. .....

3. .....[3]

(b) Which type of organism causes gonorrhea? .....[1]

(c) Which method of contraception helps to limit the spread of gonorrhea?

.....[1]

[Total : 5]

5 Fig. 5.1 shows changes in blood pressure in the left atrium, left ventricle and aorta one heartbeat.

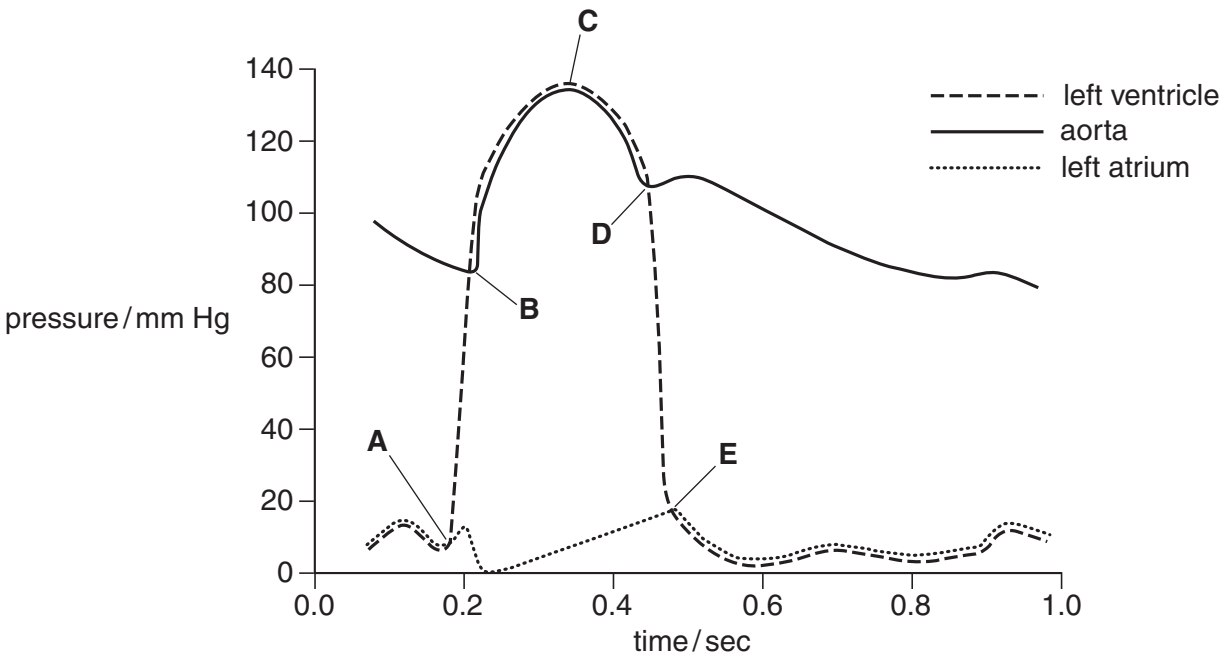


Fig. 5.1

(a) What is the highest pressure reached in

(i) the left ventricle, ... mm Hg [1]

(ii) the left atrium? ..... mm Hg [1]

(b) Valves close when the pressure in one chamber first becomes greater than that in the previous chamber.

Which letter, **A**, **B**, **C**, **D** or **E**, indicates the closing of

(i) the bicuspid valve, ...[1]

(ii) the aortic valve? .....[1]

(c) Which feature of the left ventricle enables it to generate a pressure four times greater than that of the right ventricle?

.....

.....[1]

[Total : 5]

6 **(a)** State two uses of calcium ions in the body, other than in forming bones and teeth.

1. .....

2. .....[2]

(b) Which vitamin is needed for the uptake of calcium from the gut? .....[1]

(c) Why does a breast-feeding mother need high calcium levels in her blood?

.....[1]

[Total : 4]

7 Fig. 7.1 compares the number of smokers and non-smokers suffering from bronchitis in two towns. Town **A** has a higher level of air pollution than town **B**.

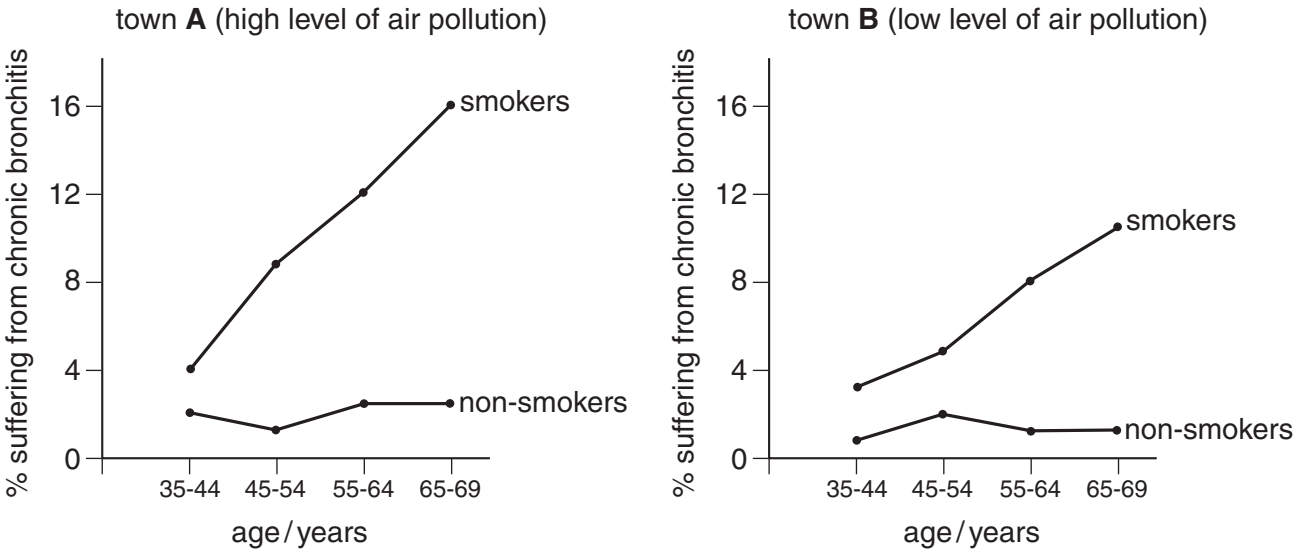


Fig. 7.1

What is the evidence from the two graphs that

(a) smoking increases the incidence of bronchitis;

.....

.....[2]

(b) air pollution also increases the incidence of bronchitis;

.....

.....[2]

(c) smoking progressively damages the body's defences?

.....

.....[2]

8 Fig. 8.1 shows a blood smear as seen under the microscope.

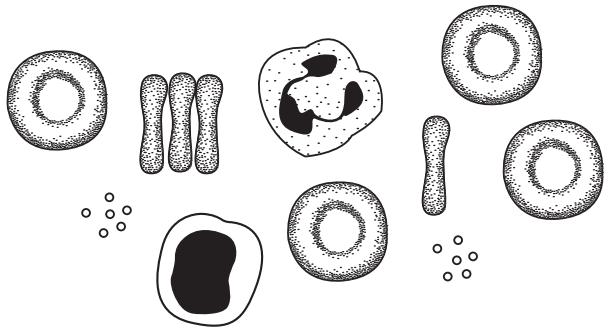


Fig. 8.1

(a) On Fig. 8.1, label a phagocyte. [1]

(b) Using only the terms **natural active**, **artificial active**, **natural passive** and **artificial passive**, state which type of immunity is being described below.

(i) immunity developed from a serum

.....[1]

(ii) immunity following an attack of influenza

.....[1]

(iii) immunity resulting from antibodies crossing the placenta

.....[1]

(iv) immunity developed from a vaccine

.....[1]

[Total : 5]

Section B

Answer **three** questions.

Question **11** is in the form of an **Either / Or** question. Only one part should be answered.

Write your answers on the separate answer paper provided.

9 **(a)** Use your knowledge of digestion to explain the following statements.

Runners in a long-distance race will have a large, starchy meal several hours before their race starts.
Sprinters eat glucose tablets just before their race starts. [10]

(b) In the blood of the hepatic portal vein, glucose levels rise some hours after a meal. In the blood of the hepatic vein, glucose levels remain constant. Explain how the blood glucose level is regulated. [5]

[Total : 15]

10 **(a)** Describe the stages in making sewage harmless and include the parts played by microorganisms. [10]

(b) Describe the dangers to people and to the environment of allowing untreated sewage to flow into rivers. [5]

[Total : 15]

Question 11 is on the next page.

11 Either

(a) When reading a word in a book, we look directly at it, making sure it is well lit. Fr… knowledge of the retina, explain why we do this.

(b) Explain why, in dim light, objects are more clearly seen out of the corner of the eye. [2]

(c) What changes occur in the eye when we move from a dimly lit room into bright sunlight? [4]

(d) Eye-colour in humans is controlled by two alleles, **B** and **b**, where **B** is dominant and gives brown eye-colour.

(i) Using a genetic diagram, explain how two brown-eyed parents may have a blue-eyed child. [4]

(ii) What is the probability that any child of these parents is blue-eyed? [1]

[Total : 15]

Or

(a) The blood of patients with liver disease shows abnormally high levels of amino acids and little or no urea. Why is this? [2]

(b) Blood arriving at the kidneys contains proteins, amino acids and urea. Describe what happens to these substances as they pass through the kidneys. [6]

(c) How does the urine of a person who has been sweating a lot differ from the urine produced by that person on a cold day? Explain how the differences come about. [5]

(d) Patients with high blood pressure are given diuretics. These are medicines that increase urination. How does this help to reduce blood pressure? [2]

[Total : 15]

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