Cambridge Assessment International Education

SECOND PREDICTED PAPER 4 MAY/JUNE 2025

Cambridge IGCSE™

CANDIDATE NAME: Solved by Anubha Roberts

CENTRE NUMBER | | | | | |

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BIOLOGY **0610**

Paper 4 Theory (Extended)

1 hour 15 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

For any further queries please contact on email below-

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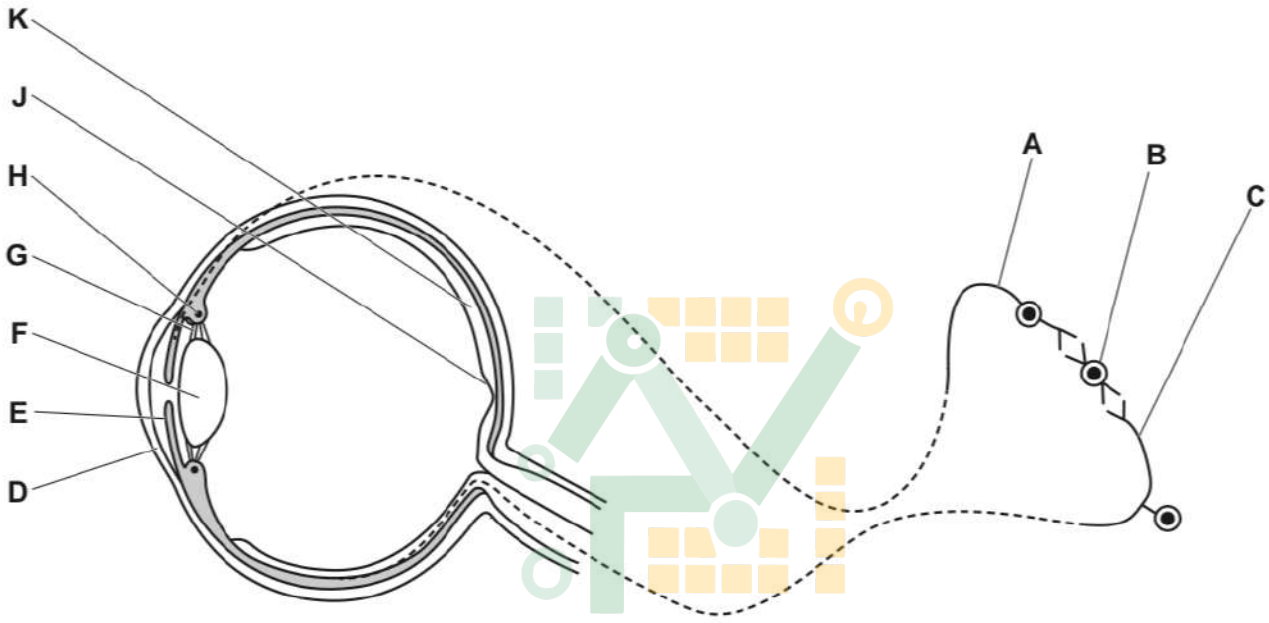
1 **(a)** Complete the sentence about the nervous system.

The brain and spinal cord form the ..... nervous system and the nerves coming into and out of the spinal cord are part of the ..... nervous system. [1]

(b) Fig. 1.1 shows part of a human eye and three neurones that conduct electrical impulses between the eye and the brain. These neurones are involved in the pupil reflex.



not to scale

Fig. 1.1

(i) State the type of neurones identified in Fig. 1.1.

A .....

B ..... [2]

(iii) Write the correct letters to complete the reflex arc.

J				E

[1]

(iv) Table 1.1 shows the names of some parts of the eye, their functions and the letters in Fig. 1.1 that identify the parts of the eye.

Complete Table 1.1.

Table 1.1

part of the eye	function	letter in Fig. 1.1
suspensory ligament		**G**
	contracts in response to a bright light	
cornea		
	contains a high density of cones for colour vision	

[4]

(c) Impulses travel within the neurones through electrical impulses.

Explain how impulse travels in between two neurones.

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.....[5]

[Total: 13]

2 (a) A group of students investigated the digestion of fat in milk.

- They added an alkaline solution to the milk.
- They divided the milk into four test-tubes.
- They added lipase and bile salts to some of the test-tubes, as shown in Table 5.1. They did this at the same time for each test-tube.
- They kept all test-tubes at 40 °C.
- After 5 minutes, they added Universal Indicator solution to each test-tube.

Table 5.1

test-tube	contents	colour of pH indicator after 5 minutes at 40 °C
A	milk, alkaline solution, lipase and bile salts	orange
B	milk, alkaline solution, bile salts and water	blue
C	milk, alkaline solution, lipase and water	yellow
D	milk, alkaline solution and water	blue

Fig. shows the colour of the indicator at different pH values.

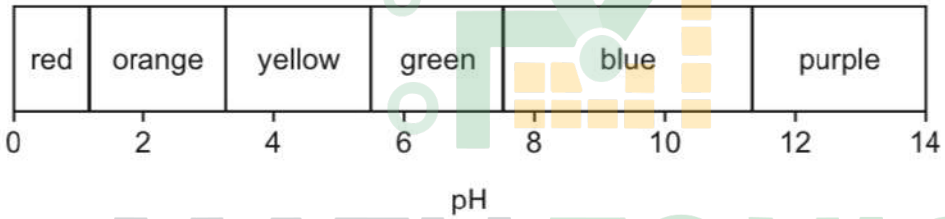

Fig.

(i) Explain why test-tube **D** was included in the investigation.

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..... [2]

(ii) Explain why the colour in test-tube **A** was orange.

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..... [3]

(iii) Explain the results for test-tubes **B** and **C**.

test-tube **B** .....

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test-tube **C** .....

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..... [4]

(b) Enzymes have a specific three dimensional shape.

Explain why the shape of an enzyme is important.

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.....[3]

[Total: 12]

3 Fig. is a diagram of the human female reproductive system.

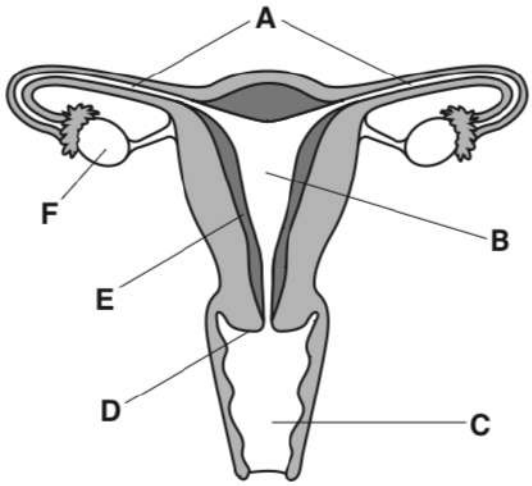

Fig.

(a) Complete Table 4.1 to show the letter and the name of each of the structures that perform these functions.

Table 4.1

function	letter	name
releases oestrogen		
site of fertilisation		
site of implantation		
site of sperm deposition		

[2]

(b) Fertilisation is the fusion of the nuclei of a male gamete and a female gamete resulting in a zygote.

State the number of chromosomes present in a human:

female gamete .....

zygote .....

[2]

(c) Chlamydia is a sexually transmitted infection (STI). It is caused by a bacterium *Chlamydia trachomatis*.

Fig. 4.2 shows the number of reported cases of chlamydia in females in each age group in one country.

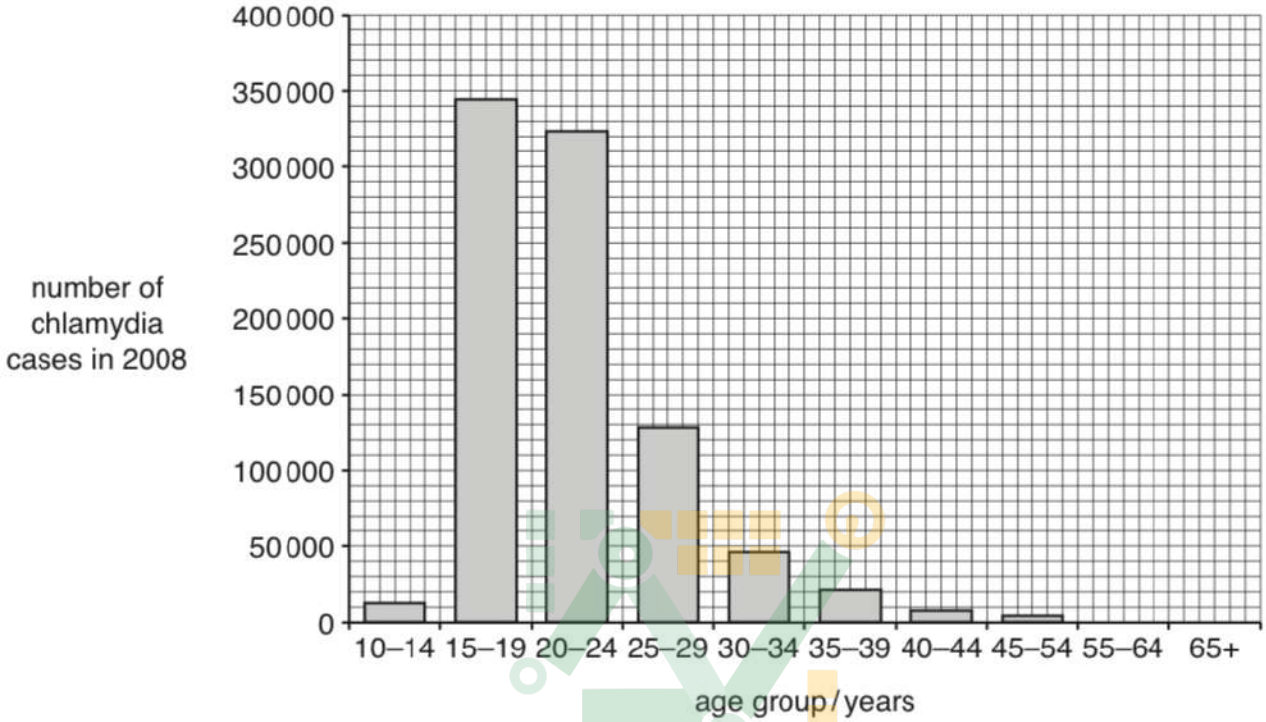

Fig. 4.2

Describe the results shown by the data in Fig. 4.2.

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.....[3]

(d) Chlamydia is caused by a bacterium.

(i) Suggest a treatment for chlamydia.

.....[1]

(ii) State the name of **one other** STI.

.....[1]

(iii) Complete the sentences about the spread of STIs.

STIs are transmitted through the transfer of ..... during sexual contact. One way individuals can avoid the spread of STIs is to use a type of barrier contraception. One example of this type of contraception is ..... .

[2]

(iv) Outline two ways in which the spread of STI can be reduced.

1. .....
2. ..... [2]

[Total: 13]

4 The four o'clock plant, *Mirabilis jalapa*, can have flowers of three different colours as shown in Fig. 4.1.

Fig. 4.1

(a) A student crossed some crimson-flowered plants with some yellow-flowered plants (cross 1). She collected the seeds and grew them. All of the plants that grew from these seeds had orange-red flowers.

Complete the genetic diagram to explain the result of cross 1.

parental phenotypes	crimson flowers	×	yellow flowers
parental genotypes	A^CA^C	×	A^YA^Y
gametes	.....	+	.....
offspring genotype	.....		
offspring phenotype	.....		

[3]

(b) Flower colour in M. jalapa is produced by proteins pigments called carotenoids

Explain in brief how these carotenoids are produced in plants.

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..... [3]

(c) Farmer grow tall wheat plants to ensure good yield. Tall height is dominant over recessive. How will a farmer ensure that a plant is homozygous dominant before crossing it for producing other varieties.

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..... [2]

Flowers from *M. jalapa* were cross-pollinated.

(d) Explain the difference between self-pollination and cross-pollination.

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..... [2]

(e) Some species of plants are self-pollinated.

Discuss the advantages of self-pollination over cross pollination.

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..... **[4]**

[Total: 14]

5 Exercise that occurs over a longer period of time than weightlifting often involves aerobic respiration as well as anaerobic respiration.

Fig. shows the oxygen consumed by an athlete during and after a 5000 metre race.

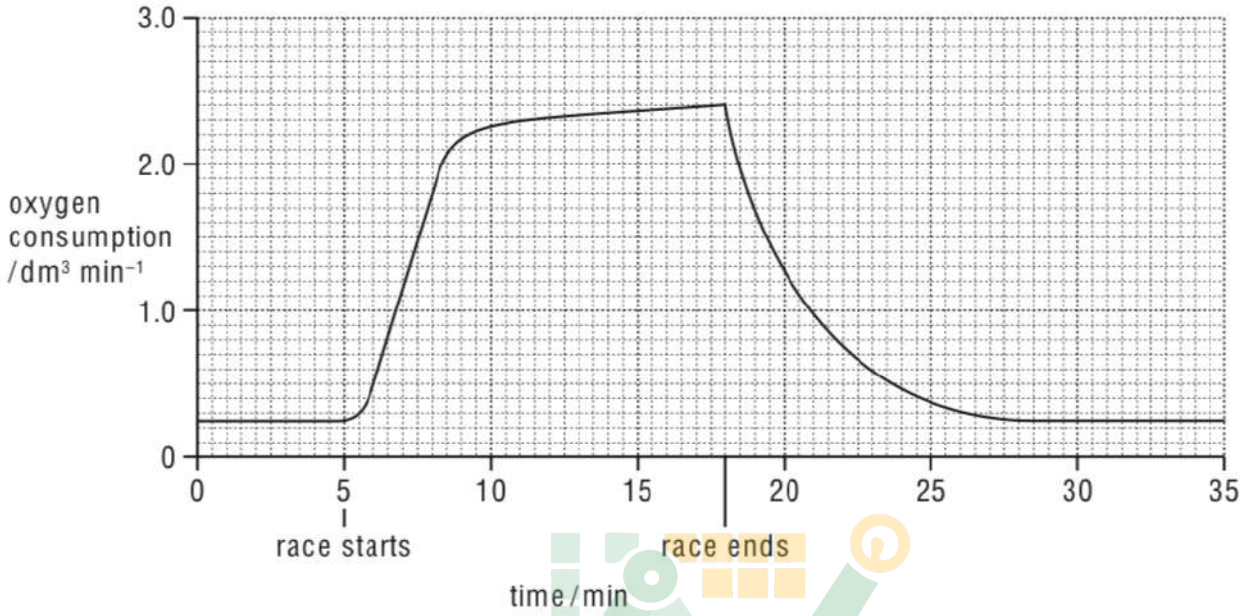

Fig.

(a) Describe the athlete's oxygen consumption during **and** after the race as shown in Fig. 4.2.

You will gain credit for using the figures in the graph to support your answer.

during .....

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after .....

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..... [4]

(b) Explain how this change during exercise is coordinated and why the oxygen consumption does not return back to normal immediately after the exercise is finished.

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[5]

[Total: 9]

6 This question is about transport in plants.

(a) Two pea plants, **D** and **E**, were supplied with substances containing the radioactive isotopes, carbon-14 (^{14}C) or phosphorus-32 (^{32}P), as shown in Fig. 4.1.

A leaf of plant **D** was exposed to radioactive carbon dioxide.

Plant **E** was placed into a solution containing radioactive phosphate ions.

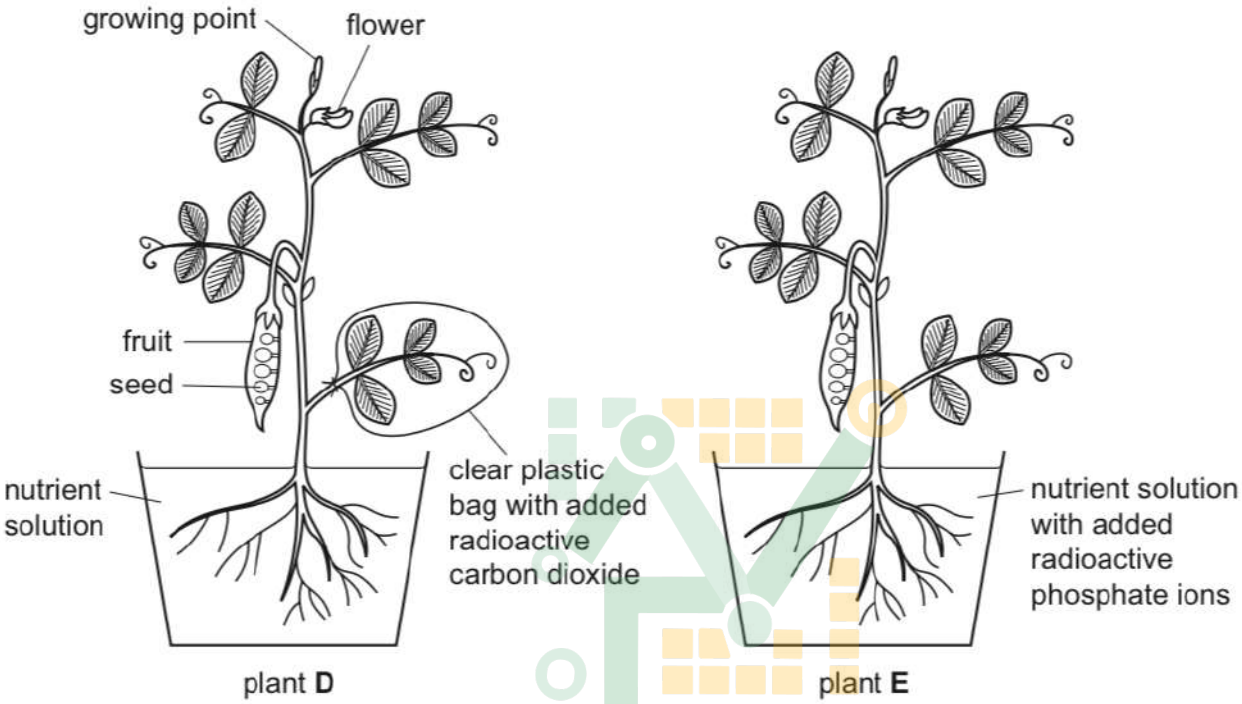

Fig. 4.1

After several hours the plants were analysed for the presence of the radioactive isotopes.

Sucrose containing ^{14}C was found throughout plant **D**.

Compounds containing ^{32}P were found throughout plant **E**.

Complete Table 4.1 to show:

- the tissue in which each substance is transported;
- **one** possible sink for each substance.

Table 4.1

pea plant	**D**	**E**
substance transported	sucrose	phosphate ions
transport tissue		
sink		

[2]

(b) State **one** substance, **other than sucrose**, that is produced in leaves and translocated to other parts of the plant.

.....[1]

(c) Explain how sucrose can be transported in the phloem upwards and downwards.

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.....[4]

(d) State two uses of water within a pea plant.

1 .....

2 .....[2]

[Total: 9]

7 Fig. shows the Calayan rail,
Calayan Island in the Philippines. This species of bird was discovered in 2004.

Fig.

(a) State the name of the genus of the Calayan rail.

.....[1]

Many bird species are threatened by deforestation.

(b) Suggest three reasons why deforestation occurs.

1 .....

2 .....

3 .....[3]

(c) Suggest the likely effects of deforestation on populations of bird species.

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.....[3]

(d) Some species of birds, such as the Calayan rail, are endangered.

Outline the reasons why it is important to conserve species.

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..... [3]

[Total: 10]