

LIFE SCIENCES: PAPER II

Time: 2 hours

100 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 5 pages and a Source Material Booklet of 16 pages (i–xvi). Please check that your question paper is complete. Remove the Source Material Booklet from the middle of the question paper.
 2. The question paper consists of three questions. Question 1 and Question 2 are case studies and Question 3 is an essay. Read the sources provided in the Source Material Booklet and use this information and your own knowledge to answer Questions 1 and 2.
 3. Source material is also provided in the Source Material Booklet for the essay. Use this information and your own knowledge to first plan and then write your response.
 4. All questions must be answered in the Answer Book provided.
 5. Read the questions carefully.
 6. Please start **each question** on a **new** page and leave lines open between all sub-questions (e.g. 1.1 and 1.2).
 7. Number the answers exactly as the questions are numbered in the question paper.
 8. Use the total mark that can be awarded for each part of the questions in Question 1 and 2 as an indication of the detail required.
 9. It is in your own interest to write legibly and to present your work neatly.
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SECTION A**QUESTION 1**

Refer to pages ii–iv of the Source Material Booklet. Use this information as well as your own knowledge to answer the questions which follow.

- 1.1 From the text give the scientific term for the following descriptions:
- 1.1.1 A developing plant inside a seed. (1)
 - 1.1.2 Chemical messenger substances. (1)
 - 1.1.3 Having both sexes in the same flower. (1)
- 1.2 Both sexual and asexual reproduction may be used to propagate orchids.
- 1.2.1 Briefly describe the difference between pollination and fertilisation in flowering plants. (4)
 - 1.2.2 Draw a single table listing ONE advantage and ONE disadvantage of breeding orchids using (i) sexual as well as (ii) asexual reproduction. (6)
 - 1.2.3 Explain the statement taken from the text in terms of growing orchids: 'Hybridisation is like a box of chocolate. You never know for sure what you're gonna get'. (3)
- 1.3 Study Figure 3 on page iv showing the cloning method for growing orchids. Using information from the text, provide the number of the most appropriate place where the following are evident:
- 1.3.1 high levels of auxins are present in the agar
 - 1.3.2 cytokinins are present in the agar
 - 1.3.3 colchicine might be used
 - 1.3.4 an explant is placed onto nutrient agar (4)
- 1.4 Study Figure 2 on page iv of the Source Material Booklet showing an orchid flower and a lily flower. Match the following descriptions of labels on the orchid flower to the correct named structures in the lily flower. Write the question number, the letter which matches the correct label, AND the name of the labelled part in your Answer Book. (e.g. 1.4.1 a – petal).
- 1.4.1 Structure producing pollen
 - 1.4.2 Structure accepting pollen
 - 1.4.3 Structure containing ovules (6)
- 1.5 Using the information in the sources state which type of reproductive strategy, r or K, is shown by orchids. Give ONE piece of evidence from the text to support your answer. (2)
- 1.6 Why would orchid growers be interested in trying to force polyploidy to take place in orchids? (2)

[30]

QUESTION 2

Refer to pages v–ix of the Source Material Booklet. Use this information as well as your own knowledge to answer the questions which follow.

- 2.1 Study the following table which consists of rows with two statements / items (numbered 1 and 2) in the second column and a biological term in the first column. These items are taken from the text and diagrams in the sources. Use your own knowledge and information from the sources and **decide which term(s) relate to each item.**

Write down your choice, making use of the following codes:

- A** only statement / item 1 relates to the term
B only statement / item 2 relates to the term
C both statements / items 1 and 2 relate to the term
D neither statements / items 1 nor 2 relate to the term

Term	Statement / Item
2.1.1 Vasectomy	1. No liquid secretions made 2. No sperm in semen
2.1.2 Sertoli cells	1. Sperm nutrition 2. Prostate gland
2.1.3 Pituitary gland	1. ADH 2. Growth hormone
2.1.4 FSH	1. Growth of embryo 2. Production of corpus luteum

(4)

- 2.2 2.2.1 Provide THREE reasons why the use of condoms receives more support than other contraceptive methods. (3)

2.2.2 Draw a fully labelled diagram of a sperm cell. (5)

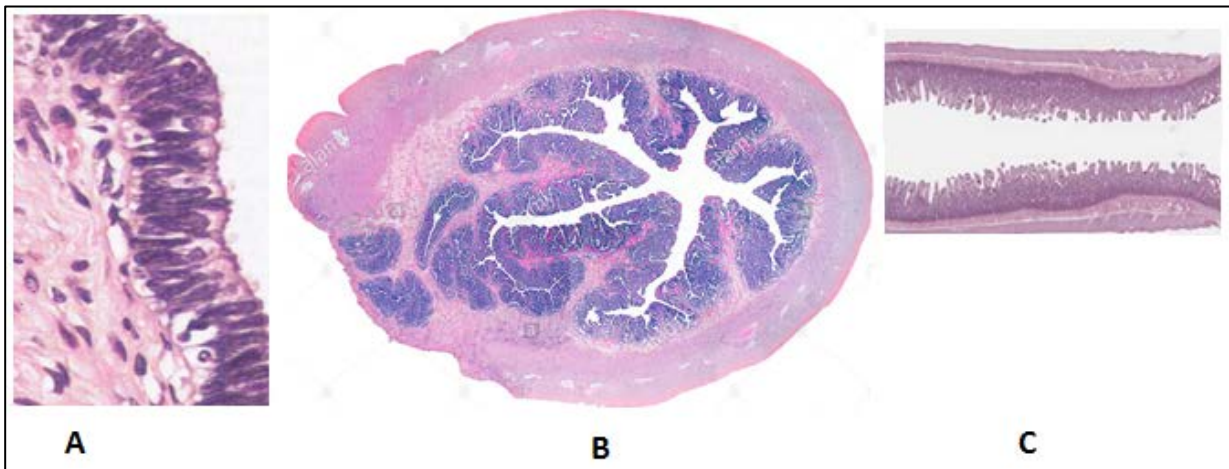
- 2.3 Calculate the number of contraceptive failures for 10 000 people that use condoms as their method of preventing pregnancy. Show all working. (3)

- 2.4 Study Figure 7 on page viii of the Source Material Booklet. Use the information in the text as well as your own knowledge to match the correct statements / terms in Column A with the label numbers in Column B shown in Figure 7. Write the question number in your Answer Book and next to it the appropriate number from column B which matches the statement / term in Column A (e.g. 2.1.4. 1)

Question Number	Column A	Column B
2.4.1	RISUG	1
2.4.2	Spermatogenesis	2
2.4.3	Circumcision	3
2.4.4	Secretes alkaline liquid into semen	4
2.4.5	Transport of semen and urine	5

(5)

- 2.5 2.5.1 How would devices that cover the cervix work to prevent a pregnancy? (2)
- 2.5.2 Suggest ONE reason why it was important for Margaret Sanger to have persisted in her education of women about the use of diaphragms. (2)
- 2.6 Use information from the flow diagram in Figure 9 on page ix of the Source Material Booklet to explain how injecting testosterone can act as a contraceptive in males. (4)
- 2.7 Study the micrographs below showing THREE different sections through the Fallopian tubes/oviducts of the female reproductive system. Write down the letter (A, B or C), which correctly represents a complete **cross section** of the Fallopian tubes. (2)



[Adapted: <https://www.slideplayer.com>]

[Adapted: <https://c8.alamy.com>] [Adapted: <https://www.pathologyoutlines.com>]

[30]

60 marks

SECTION B

Refer to pages x–xvi of the Source Material Booklet.

QUESTION 3

Consider the following statement:

The use of hormones for doping in sport should be legalised.

Using the Source Material provided on pages **x–xvi** as well as your own knowledge, discuss your opinion on the statement in the form of an essay of 2½–3 pages.

In your response you are expected to:

- Read the source material carefully.
- Take a definite stand on the statement.
- Plan your essay before you start writing. Your plan will be marked.
- Present a debated argument, using relevant information from sources A to H as well as your own knowledge of biology, to support your point of view.
- Arrange the information to best develop your argument.
- Write in a scientifically appropriate way.
- **In your essay, ensure that you have discussed at least 9 different facts from the sources.**

40 marks

Total: 100 marks