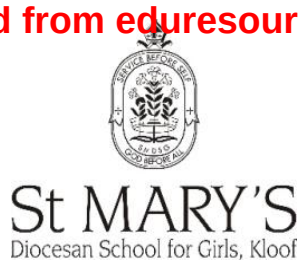
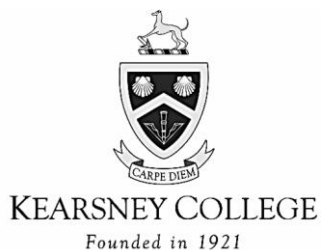




eduresourceza.com



LIFE SCIENCES : PAPER 2

TRIAL EXAMINATION – SEPTEMBER 2024

EXAMINATION NUMBER :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Time : 2 hours

100 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 14 pages and a Source Material Booklet of 15 pages (pages i - xv). Please check that your question paper and source booklet are complete.
2. The question paper consists of three questions. Question 1 and Question 2 are case studies and Question 3 is an essay.
3. Source material is provided in the Source Material Booklet for all three questions.
4. Read the questions carefully.
5. **Answer ALL the questions on the question paper** and hand this in at the end of the examination. Write your examination number in the space above.
6. Use the total number of marks that can be awarded for each part of the questions in Question 1 and 2 as an indication of the detail required.
7. It is in your own interest to write legibly and to present your work neatly.
8. TWO additional pages (pages 15 - 16) are included at the end of the paper. If you need extra space for a question use these pages. Clearly indicate the question number of the answer if you need the extra space.

Q 1	Q 2	Q 3	TOTAL
30	30	40	100

QUESTION 1

Refer to pages ii - v in the Source Booklet, as well as your own knowledge to answer the questions that follow.

1.1 Provide the correct term from the sources, for the following:

1.1.1 A condition caused by high levels of testosterone.

(1)

1.1.2 A disorder that occurs when the pituitary gland secretes too much growth hormone (GH) in adulthood.

(1)

1.1.3 The process of physical maturation where an adolescent reaches sexual maturity and becomes capable of reproduction.

(1)

1.2 Polycystic Ovary Syndrome (PCOS) is a common chronic condition in women, which causes hormonal imbalances leading to higher levels of testosterone, irregular periods and cysts in the ovaries.

1.2.1 Using the information in Source A, what is the highest level of testosterone found in women with PCOS?

(1)

1.2.2 If a woman with PCOS is found to have a testosterone level of 5.5 nmol/l, would she be permitted to participate in international sporting events? Motivate your answer with evidence from the sources.

(1)

- 1.2.3 **Other than** increased muscle mass and strength, and increased levels of haemoglobin, name TWO secondary sex characteristics that a woman with hyperandrogenism could present with as a result of higher than normal testosterone levels.

(2)

- 1.3 Source B explains that Caster Semenya has the 'Intersex' condition caused by a deficiency of 5 α -Reductase 2 (5-ARD).

- 1.3.1 In your own words, explain why this condition is called, 'Intersex'.

(2)

- 1.3.2 Would an individual with this condition be able to fall pregnant and carry a foetus to term? Justify your answer.

(2)

- 1.4 Gonadotropins are a group of hormones secreted by the pituitary gland, that stimulate the release of the reproductive hormones.

- 1.4.1 Name the hormone that stimulates the testes to secrete testosterone.

(1)

- 1.4.2 Name the hormone that is also secreted by the pituitary gland and works together with testosterone to stimulate the process of spermatogenesis.

(1)

1.5 Refer to the diagram in Source D and your own knowledge to answer the following questions:

1.5.1 Of the cells found at positions A, C and D, which is / are haploid? Give the letter and the correct name of this type of cell.

(2)

1.5.2 Write the **letter** and the **name** of the cells that provide food for the developing sperm.

(2)

1.6 Draw a flow chart in the space below to describe the feedback mechanism associated with the production of testosterone and sperm.

(5)

1.7 Refer to the study described in Source F.

1.7.1 Suggest a hypothesis that could have been used in this study.

(3)

1.7.2 In your opinion, are the results of the study a fair representation of how increased testosterone levels enhance performance in athletes with hyperandrogenism? Suggest TWO points to support your answer.

(2)

1.8 The International Association of Athletics Federation's (IAAF) ruling regarding testosterone levels in females is based on conditions related to the sex chromosomes and sex hormones. Currently there are no rulings regarding other genetic conditions. Considering this, do you think the ban on women with high testosterone levels from participating in international sporting events is fair? Use evidence from the sources to motivate your answer.

(3)

[30]

QUESTION 2

Refer to pages vi - ix in the Source Booklet, as well as your own knowledge to answer the questions that follow.

2.1 There is a symbiotic relationship that exists between bats and certain plants (e.g. cacti, mango, agave, etc).

2.1.1 Describe this relationship by referring to examples in your answer.

(2)

2.1.2 Contrast between the process of 'pollination' and 'fertilisation'.

(2)

2.1.3 Describe TWO ways in which the flowers of plants pollinated by bats are structurally adapted to this form of pollination.

(2)

- 2.2 The agave plants in Mexico are often harvested before they flower, therefore they have to reproduce through cloning.

2.2.1 Define the term 'clone'.

(1)

2.2.2 What type of reproduction is cloning?

(1)

2.2.3 Describe ONE advantage and ONE disadvantage of the type of reproduction identified in Question 2.2.2.

Advantage: _____

Disadvantage: _____

(2)

- 2.3 Refer to the image in Source C and your own knowledge to answer the following four questions:

2.3.1 Which structure/s, A, B, and/or C make up the female part of the Saguaro flower?

(1)

2.3.2 Provide labels for A and B.

A _____ B _____

(2)

2.3.3 What is structure C responsible for?

(1)

2.3.4 Is the Saguaro flower adapted for self-pollination or cross-pollination? Give ONE piece of evidence to support your answer.

(2)

2.4 Refer to Source D and E and your own knowledge to answer the following questions:

2.4.1 What is meant by the term 'reproductive strategies'?

(2)

2.4.2 Are bats oviparous, ovoviviparous or viviparous?

(1)

2.4.3 Identify ONE other reproductive strategy **that you learnt about** that is used by bats. Provide evidence from the sources to support your answer.

(2)

2.5 Identify an alternate term for 'fallopian tube' from the sources.

(1)

2.6 Are bats K-strategist species or r-strategist species? Give a reason for your answer.

(2)

- 2.7 Complete the graph below showing the survivorship curve of bats, as identified in Question 2.6. No heading is required.



(3)

- 2.8 In 2019, bats were implicated in the origin and spread of the COVID-19 virus which caused a global pandemic. Since this time, research has shown that the exact origin of SARSCoV-2 (the novel coronavirus that causes COVID-19) is not known and diverged from the closest coronavirus found in bats 40 – 70 years ago.

Using information from the sources, discuss how the implication that bats were responsible for the origin and spread of COVID-19 may have impacted on their ecosystems.

(3)

[30]

QUESTION 3

A woman is most fertile between the ages of 20 and 35 years. Many women, however, are delaying conception in our modern society. Assisted Reproductive Technology* is, therefore, currently being used to help older mothers conceive and many new techniques are in development.

Assisted Reproductive Technology:** treatments or procedures that include *in vitro manipulation of human oocytes (eggs) and sperm or embryos for the purpose of establishing pregnancy.

****In vitro:** outside the body

Consider the following statement:

We should be using Assisted Reproductive Technology to extend the reproductive lifespan of woman.

Using the source material provided (pages x – xv) as well as your own knowledge, discuss your opinion on this 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 planning will be marked.
- Present a debated argument. Use relevant information from sources A – I as well as your own knowledge of Life Sciences 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 nine different facts from the sources.

[40]

Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

Downloaded from eduresourceza.com

eduresourceza.com

[illegible]

