Glenalmond College
let your story begin

Scholarship Examination

Biology

2020

Time: 30mins

Marks: 31

Name: .....

School:.....

Q1.

Plants can reproduce sexually or asexually.

Plants that reproduce sexually can be pollinated by insects or by wind.

(a) State three ways in which the structure of insect-pollinated flowers differs from the structure of wind-pollinated flowers.

(3)

1 .....

.....

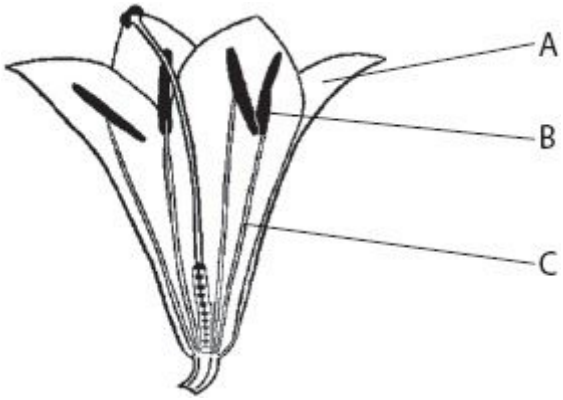
2 .....

.....

3 .....

.....

(b) The diagram shows a flower from a plant.



Name the structures labelled on the diagram.

(3)

A .....

B .....

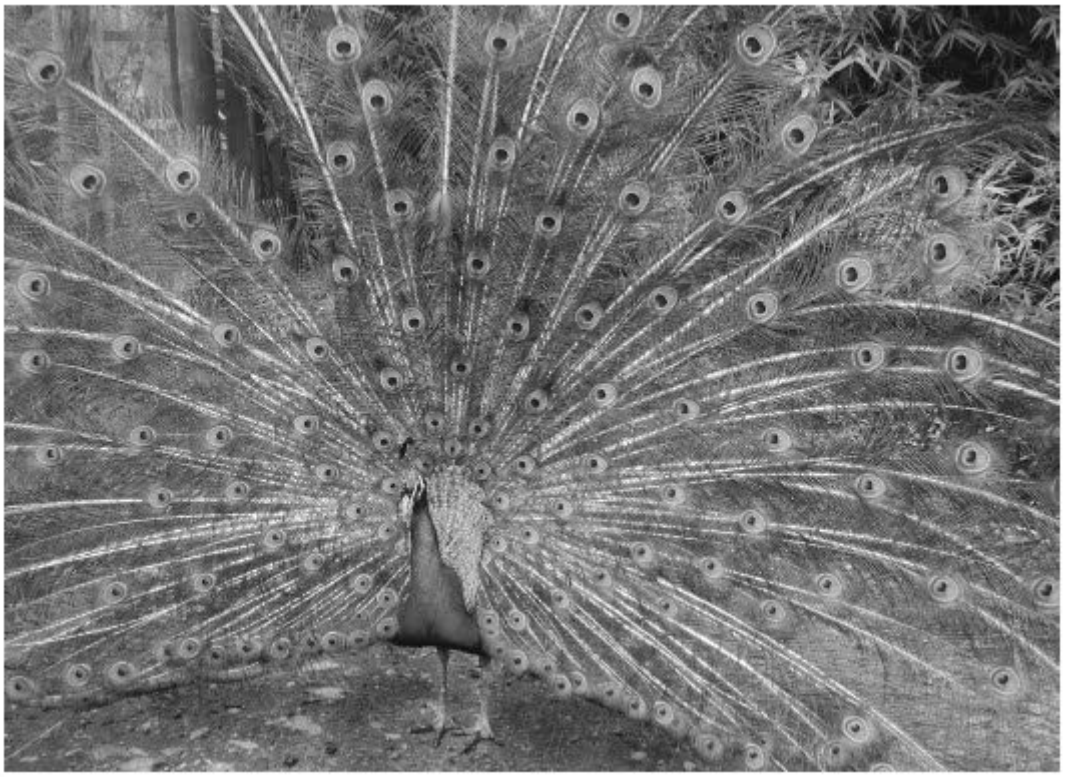
C .....

(Total for question = 6 marks)

Q2.

The peacock is a bird found in the jungle in India.

The male has a large, colourful tail that he displays during courtship to attract a female to mate with.



Use your knowledge of natural selection to suggest how the peacock's tail has evolved.

(5)

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(Total for question = 5 marks)

Q3.

The passage describes the consequences of air pollution.

Complete the passage by writing a suitable word or words on each dotted line.

(10)

The release of the gas sulfur ..... into the atmosphere is an example of air pollution because the gas dissolves in water in air to form ..... rain. This rain can kill trees on land and fish in lakes.

Another gas that pollutes the air is ..... monoxide. This gas combines with ..... in red blood cells and makes it more difficult for them to carry out their function.

Other gases that pollute the atmosphere are greenhouse gases such as ..... and nitrous oxide from the burning of ..... fuels, and ..... from the digestive system of cattle.

These gases increase the ..... effect and may lead to a problem known as ..... in which the air temperature may rise.

This rise in air temperature may destroy the place where a species lives known as its ..... .

(Total for question = 10 marks)

Q4.

The table shows the number of deaths in the United Kingdom in 2010 caused by cancer, lung diseases and circulatory diseases. The table also shows the number of these deaths caused by smoking.

Cause of death	Total number of deaths	Number of these deaths caused by smoking
cancer	66 000	38 000
lung diseases	46 000	22 000
circulatory diseases	138 000	20 000

(a) (i) What is the total number of deaths caused by all three diseases?

(1)

.....

(ii) Calculate the percentage of the total number of deaths that are caused by smoking.
Show your working.

(2)

percentage ..... %

(b) Chemicals in cigarette smoke cause mutations in cells which can lead to cancer.

What is meant by the term **mutation**?

(2)

.....

.....

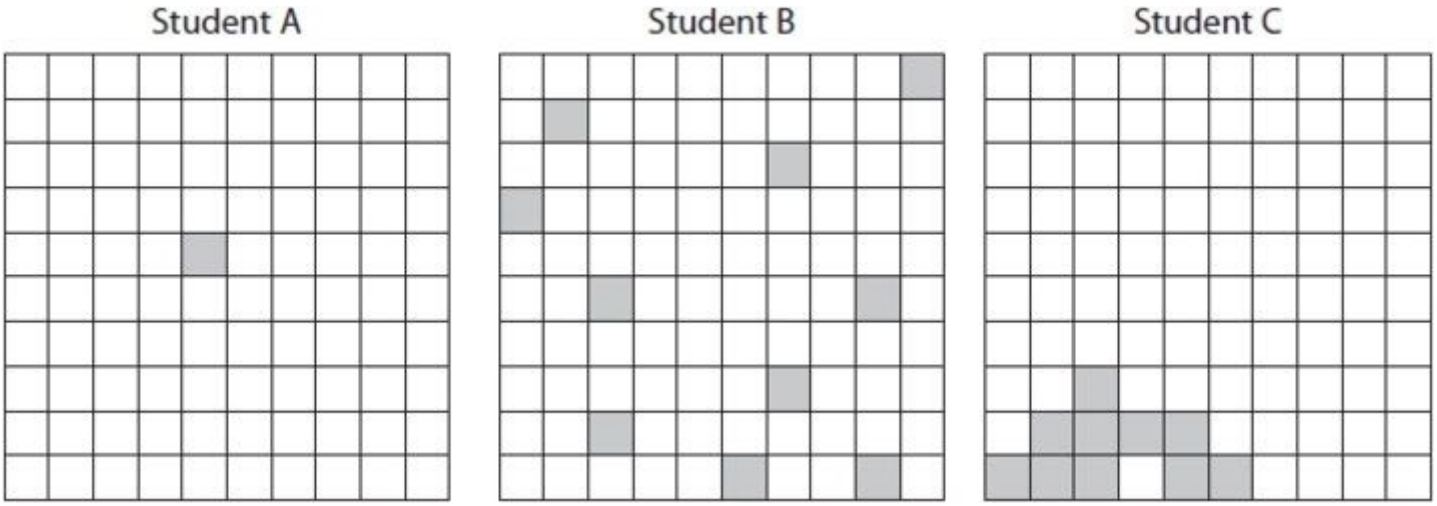
.....

(Total for question = 5 marks)

Q5.

Three students were asked to estimate the population size of a plant species in an area by using a quadrat.

The diagram shows where each student placed their quadrat in the area.



(a) (i) Which student would obtain the most reliable estimate?

Give reasons for your answer.

(2)

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.....

.....

.....

(ii) State what is meant by the term **population**.

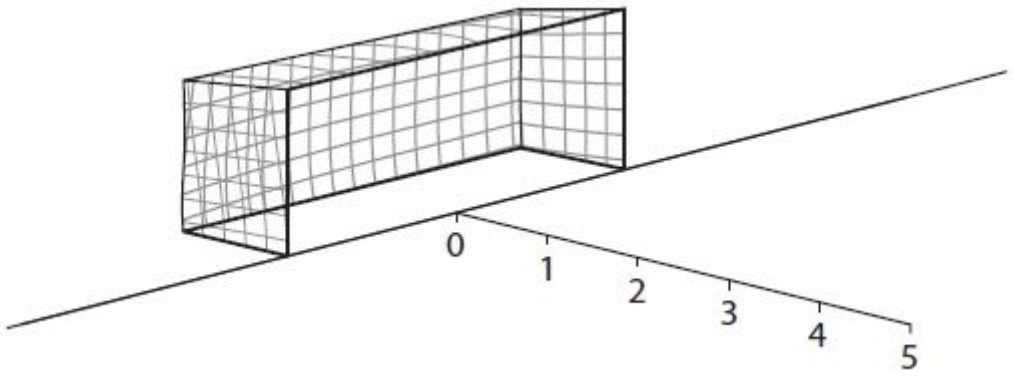
(1)

.....

.....

(b) Five other students investigated the distribution of grass in the goal area of a football pitch.

They placed a small quadrat at the goal line and then at one metre intervals in a straight line away from the goal line. The diagram shows their method.



The quadrat was 10 cm by 10 cm and was made from clear plastic. It was marked into 100 squares of

1 cm × 1 cm. If grass could be seen in 10 of the squares the percentage cover would get a score of 10%.
The table shows the results obtained by the five students.

Student	Percentage cover of grass at different distances from the goal line					
	0 m	1 m	2 m	3 m	4 m	5 m
A	14	14	38	41	90	100
B	20	13	5	47	82	90
C	15	14	45	50	86	85
D	10	18	35	50	75	83
E	10	15	30	50	70	90
average	14	15	37	48	81	90

(i) One of the averages of the results has been calculated ignoring an anomalous result.
Which student obtained the anomalous result?

(1)

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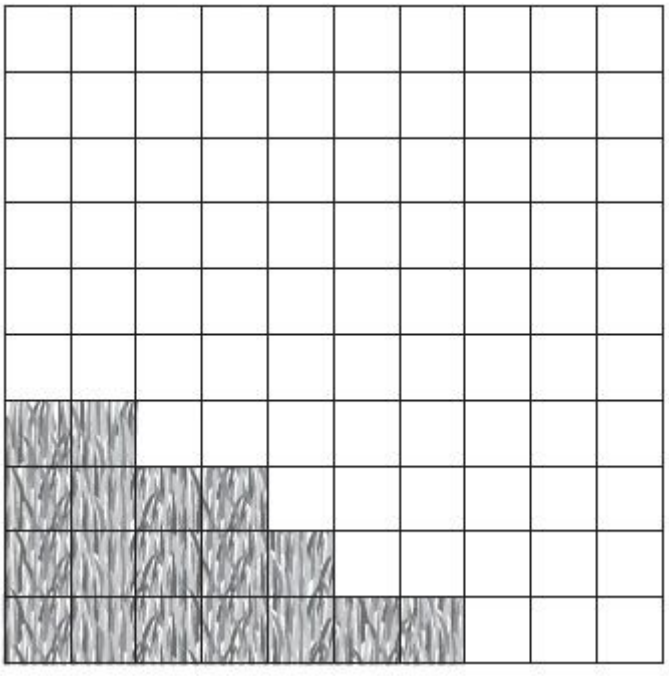
(ii) The diagram shows a quadrat used by one of the students, and the number of 1cm squares where grass can be seen.



Which student obtained the results shown in this quadrat?

(1)

.....

(Total for question = 5 marks)