

2001 HIGHER SCHOOL CERTIFICATE EXAMINATION

Biology

Section I – Part B (continued)

Marks

Question 19 (6 marks)

In your Biology course, you performed a first-hand investigation to gather information about structures in plants that assist in the conservation of water.

(a) Describe the procedure you followed.

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A variety of leaf samples from plants were collected eg. eucalyptus, geraniums. Leaves were examined for evidence of structures used to conserve water. Examination of the leaf epidermis eg. feeling the waxy cuticles by hand, using water droppers to test permeability & distinguished waxy cuticles and stomates. Comparing the position of leaves on stems also showed how plants conserved water.

(b) Identify TWO safe work practices needed during this investigation.

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- 1) Protective clothing should be worn when acquiring leaf samples to prevent scratches etc.
- 2) Samples should be ~~placed in~~ ^{carefully} taken care of eg. placed in bags to prevent destroying or contaminating samples.

Marks

Question 20 (7 marks)

Name ONE example of an Australian endothermic animal and ONE example of an Australian ectothermic animal, and summarise their responses to the following environmental changes. Give your answer in the form of a table.

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Change 1: The ambient temperature rises well above the average daily temperature range.

Change 2: The ambient temperature drops well below the average daily temperature range.

Endothermic animal: Red kangaroo

Ectothermic animal: Blue tongue lizard.

Responses of endothermic and ectothermic animals to environmental change

Response by:	Change 1	Change 2.
Red kangaroo	Behavioural: sit under a tree in the shade and/or lick it's paws to lower body temperature	Structural: Raise it's hairs to trap body heat attempting to escape to environment.
Blue tongue lizard.	Behavioural: seek shelter under a rock or shrub.	Behavioural: Flatten it's body out in the sunlight to increase body temperature.

Question 21 (4 marks)

Sutton, Boveri and Morgan worked in the field of genetics.

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Describe the contribution made by TWO of these scientists to the understanding of the chromosomal nature of inheritance.

Sutton and Boveri each worked ~~independently~~ to study the nature of chromosomes and cofounded the chromosomal theory of inheritance. Sutton observed meiosis in grasshopper cells, ~~and the mouse~~ and Boveri also performed other investigations to observe chromosome activity. Together they discovered that chromosomes occur in homologous pairs, which are the same shape and size, and segregate during meiosis. They concluded that Mendel's 'inheritance factors' (genes) must be carried on chromosomes and that each chromosome must carry many genes, as there are many more 'factors' than there are chromosomes.