

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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Plant parts of plants such as the leaves were examined under the microscope. The plants observed were all plants that live in an arid environment & must conserve water. Each structure of the plant was observed by the eye first, ^{drawn} then by the microscope & drawn again. The different ~~an~~ structures of the plants (such as hairy leaves, waxy leaves, sunken stomata, rolled leaves etc) were compared.

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

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Care should be taken when handling the plants, especially ~~sp~~ ones with spikes, thorns or that may be poisonous, so gloves should be worn.
Protective eye glasses should also be worn when collecting the samples from their ^{natural} ~~real~~ environment & when cutting the 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: Kangaroo

Ectothermic animal: Desert lizard

	temperature rises	temperature drops.
Kangaroo	<ul style="list-style-type: none"> • Rits tail under body to reduce SA exposed to the sun. • Forearms contain dense network of capillaries. Blood flow directed to capillaries so heat radiates into air. • Also licks forearms to promote evaporation of heat. • Stays out of sun in middle of day • Produces concentrated, copious urine. 	<ul style="list-style-type: none"> • Brings tail out from underneath it to increase surface area exposed to sun. • Blood flow to forearms restricted & capillaries state constrict. • Hair/fur stands on end to create insulating layer of warm air. • Metabolism increases • goes out in sunlight.
Desert Lizard	<ul style="list-style-type: none"> • Shades itself in burrows, under rocks or leaves. • Skin colour turns pale to reflect sun's rays • lifts body off hot ground. • positions itself at right angles to the sun to decrease exposure from the sun. 	<ul style="list-style-type: none"> • basks in sunlight to warm blood. • skin colour turns dark to absorb the sun's rays. • tests whole body on ground to absorb heat from the ground. • positions itself in full sunlight.

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.

Walter Sutton and Theodor Boveri are both attributed to establishing the Chromosomal Theory of Inheritance. That is that inheritance is due to chromosomes found in every cell, that chromosomes also occur in pairs and that they have units on them (they are genes but not known at that time.) Walter Sutton concluded this by observing meiosis in grasshoppers in the formation of gametes. Boveri gained his idea by experiments using sea urchins - he found that a full set of chromosomes is needed for growth and reproduction. These hypothesis made sense of Mendel's experiments conducted earlier.