1 Fig. 3.1 shows a female lion in a game reserve.

Fig. 3.1

(a) (i) State **one** feature, visible in Fig. 3.1, which identifies the lion as a mammal.

..... [1]

(ii) State **one** other feature, **not** visible in Fig. 3.1, which distinguishes mammals from all other vertebrate groups.

..... [1]

(b) Study the eyes of the lion in Fig. 3.1.

(i) Suggest and explain what the light conditions were when the photograph was taken.

light conditions .....

explanation .....

..... [2]

(ii) Explain the importance of the eyes reacting to light in this way.

.....

..... [2]

(c) Scientists say that lions are unable to see in colour.

Suggest how a study of a lion's retina would provide evidence for this statement.

.....

..... [1]

(d) The lion in Fig. 3.1 was observing tourists nearby. It turned its head to see zebras moving in the distance.

Describe how the eyes of the lion would adjust to focus on the zebras.

.....

.....

.....

..... [3]

(e) The lion was photographed in a game reserve in Namibia.

Explain why the conservation of animals in game reserves is important.

.....

.....

.....

..... [3]

[Total:13]

2 If the glucose in the blood rises above its normal concentration, insulin is secreted to bring the concentration back to normal.

(a) (i) Suggest one explanation for a rise in the concentration of glucose in the blood.

.....

.....

[1]

(ii) Name the organ that secretes insulin.

.....

.....

[1]

(iii) Describe the role of the liver in bringing the concentration of glucose in the blood back to normal.

.....

.....

.....

.....

[2]

(iv) State the term that describes how a substance, such as glucose, in the body is maintained at a constant level.

.....

.....

[1]

(b) Diabetics are unable to control their blood glucose levels naturally.

Human insulin can now be made using bacteria that have been genetically engineered.

(i) Insulin is a protein. Suggest why insulin has to be injected rather than taken by mouth.

.....

.....

.....

.....

[2]

(ii) Explain how bacteria can be genetically engineered and used to make human insulin.

.....

.....

.....

.....

.....

.....

.....

.....

[4]

[Total: 11]