231/2
BIOLOGY
Paper 2
2005
2¼hours

Answer *ALL* the questions in this section in the spaces provided.

1. You are provided with specimens labelled S_1, S_2, Q, X, and Y
The dichotomous key below can be used to identify the specimens

1	a	Leaves simple	go to 2
	b	Leaves compound	Asteraceae
2	a	Leaves green	go to 3
	b	Leaves purple	Commelinaceae
3	a	Leaves parallel veined	Graminae
	b	Leaves net veined	go to 4
4	a	Leaf margin smooth	go to 5
	b	Leaf margin serrated	go to 6
5	a	Leaves hairy	Solanaceae
	b	Leaves not hairy	go to 8
6	a	Leaves succulent	go to 7
	b	Leaves not succulent	Malvaceae
7	a	Leaves with pointed tip	Crassulaceae
	b	Leaves with rounded tip	Crassulaceae
8	a	Leaves ovate	Nyactaginaceae
	b	Leaves lanceolate	Anacardiaceae

(a) Using the dichotomous key identify the specimens in each case show the sequence of steps (e.g. 1b, 2b, 3a, 6b etc) in the key that you followed to arrive at the identity of each specimen. (10 marks)

Specimen	Steps followed	Identity
S_1	.....	.....
S_2	.....	.....
Q	.....	.....
X	.....	.....
Y	.....	.....

(b) (i) Using the flowers, name the classes of the spermatophyta to which specimens S_1 and Q belong. (2 marks)

S_1

.....

Q

.....

(ii) Give reasons for your answers in b(i) above (2 marks)

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(c) State how specimen S_2 is adapted to its mode of pollination (2 marks)

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(d) Open the flower of specimen S_2. Draw and label the pistil. (3 marks)

Magnification (Show your working) (1 mark)

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2. Below are photographs labelled T_1 and T_2 of specimens which were obtained from the same animal. Examine them

T1

T2

(a) With reasons identify T_1 and T_2 (5 marks)

T_1

.....

Reasons

(i) .....

(ii) .....

T_2

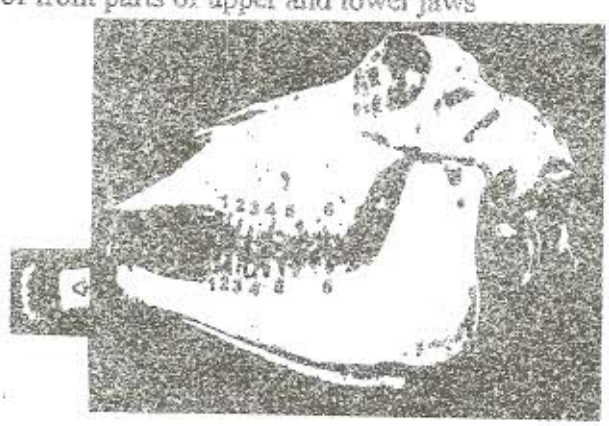
.....

Reason

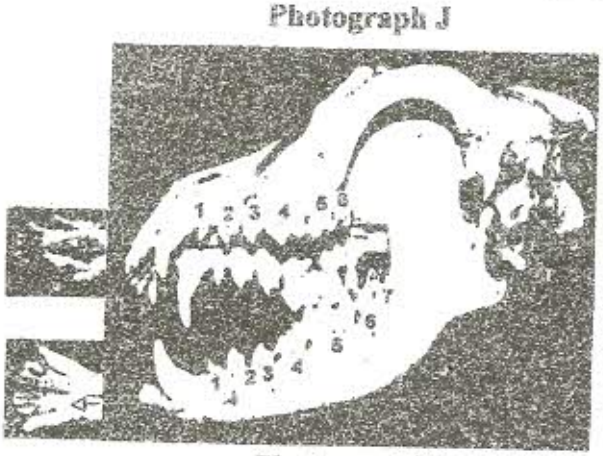
.....

(b) In photograph T_1 label four parts of the specimen (4 marks)

Examine photopraph labelled J with an inset of the front part of lower jaw and photograph K with insets of front parts of upper and lower jaws



Photograph J



Photograph K

(c) Giving reasons, state the diet of the animals whose skulls are shown in the photographs

J ..... (1 mark)

Reasons

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.....

.....

(3 marks)

K ..... (1 mark)

Reasons

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.....

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(2 marks)

(d) Label the canine tooth in photograph J (1 mark)

(e) Write the dental formula of the animals whose skulls are shown in photographs J and K (The teeth that are not very distinct in the photographs are numbered)

(2 marks)

J .....

K .....

(f) Identify the photograph of the skull from which the specimens labelled T_1 and T_2 could have been obtained. (1 mark)

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(g) In the appropriate diagram label the position where the pad would be found in a living animal (1 mark)

3. You are provided with a specimen labelled P (onion bulb with leaves and roots)

(a) Examine the inner and outer leaves of the bulb (2 marks)

(i) Record the differences between them.

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(ii) Give reasons for the differences in (a) (i) above (2 marks)

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(b) Seperate the roots and aerial leaves from the bulb.
Crush the roots, aerial leaves and the bulb separately.
To each crushed material add 1 ml of water. Put the extract from the materials into separate test tubes and label them. Using the reagents provided, test for the food substances in each of the extracts. Record the procedure, observations and conclusions in the table below (9 marks)

Extract	Procedure	Observations	Conclusion
Roots			
Bulb			
Aerial Leaves			

(c) Account for the results obtained in (b) above

(i) Roots. (3 marks)

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(ii) Bulb (3 marks)

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(iii) Aerial leaves (2 marks)

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