JUNIOR LYCEUM ANNUAL EXAMINATIONS 2001

Educational Assessment Unit - Education Division

FORM 4 **BIOLOGY** **TIME 1h 30min**

Name :_____**Class**_____

SECTION A : This section carries 55 marks
ANSWER ALL QUESTIONS IN THE SPACES PROVIDED.

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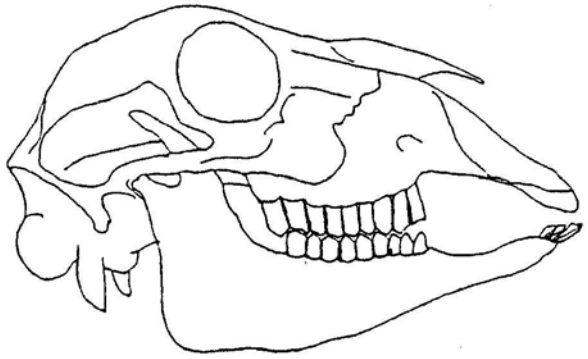
1. Complete the table below which shows mammalian digestive processes by writing suitable words in the blank spaces.

Name of ENZYME	Site of Action	Food acted upon by the enzyme.	Products
Amylase	**Mouth Cavity**		
	Stomach		**Peptides**
	Duodenum		**Fatty Acids and Glycerol.**

(total 6 marks)

2. The diagram below shows the skull of a mammal from the side.



i) What would this mammal's diet have been?

_____(1)

ii) Give two (2) features, **shown in the diagram**, which support your answer in 2i.

a) _____

b) _____(1,1)

(total 3 marks)

3. The diagram below shows a section through the heart of a mammal.

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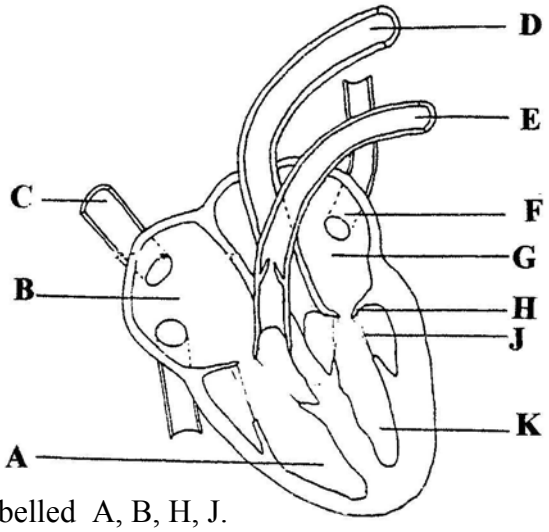

Right **Left**

i) Name the parts labelled A, B, H, J.

A:_____ H:_____

B:_____ J:_____(4)

ii) Draw **arrows** to show **direction** of blood flow through vessels **C, D, E, and F** (4)

iii) Is the blood found at **G** oxygenated or de-oxygenated? _____ (1)

iv) Give a reason for your answer in 3iii. _____

_____ (1)

v) Why is the wall of **K** thicker than the wall of **A**?

_____

_____(1)

vi) State three (3) differences *in structure or function* between an artery and a vein.

ARTERIES	VEINS

(total 14 marks) (3)

4. State three (3) reasons why water is important to living organisms.

1. _____

2._____

3._____ (3)

(total 3 marks)

5. Study the descriptions below and decide which ones belong to '**Photosynthesis'(P)** and which ones belong to '**Aerobic Respiration'(A.R.)**.

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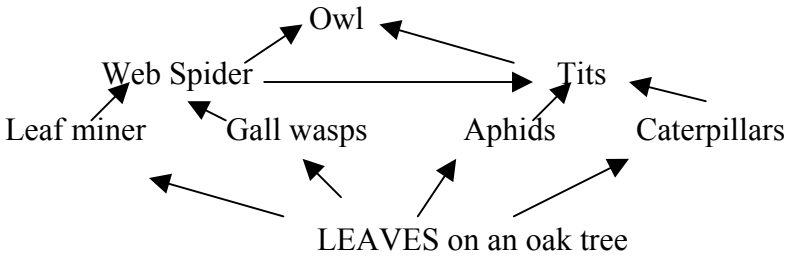
	Description	P. or A.R.
i)	uses oxygen	
ii)	takes place only in the presence of light	
iii)	releases energy	
iv)	occurs in all cells	
v)	uses water	

(total 5 marks)

6. Study this food web and answer the questions that follow.



i) From the diagram above name (a) one producer (b) 2 primary consumers.

a) One producer: _____(1)

b) Two primary consumers: _____ ; _____(1,1)

c) One secondary consumer: _____(1)

ii) From the food web shown above, construct a food chain with **four** links.

_____ → _____ → _____ → _____ (2)

iii) Name the ultimate source of energy for this food web.

_____(1)

iv) Explain why only **10% of energy** is transferred from one trophic level to another'.

_____

_____(2)

(total 9 marks)

7. Explain the terms **community** and **populations** in relation to ecosystems.

i) **Community:** _____

_____.

ii) **Populations:** _____

_____(2,2)

(total 4 marks)

8. The following question is related to the Urinary System.
Study the two diagrams below and answer the questions set.

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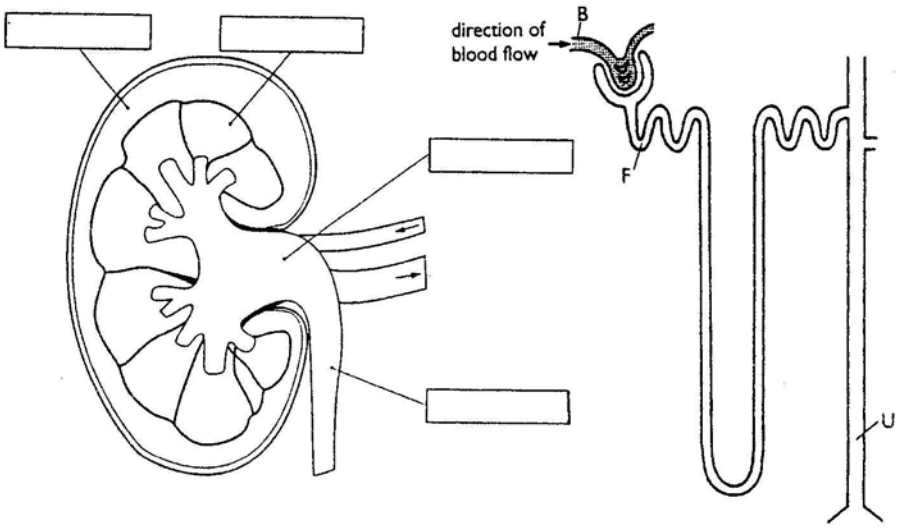

Diagram 'X' **Diagram 'Y'**

i) Which structures related to the Urinary System are shown in the above diagrams?
Diagram 'X' _____ ; Diagram 'Y' _____ (1,1)

ii) Fill in the labels in Diagram 'X' (4)

iii) Diagram 'Y' shows the filtering unit of the organ shown in Diagram 'X'. The concentration of some on the substances found in the blood (B), the filtrate (F) and the urine (U) are given in the table below.

	Urea (g/100 cm^3)	**Glucose (g/100 cm^3)**	**Protein (g/100 cm^3)**	**Salts (g/100 cm^3)**
Blood (B)	0.04	0.11	8.00	0.75
Filtrate(F)	0.04	0.11	0.00	0.75
Urine (U)	2.00	0.00	0.00	1.50

a) Which substance did not pass from B to F? _____(1)

b) Which substance was completely reabsorbed into the bloodstream? _____ (1)

c) If a person produced 150 litres of filtrate and 1.5 litres of urine in one day, what percentage (%) of filtrate was passed as urine? **(Show your workings)**

_____

_____(2)

d) Apart from the substances shown in the table, what is the major constituent of Urine?

_____(1)

(total 11 marks)

SECTION B : This section carries 45 marks.

(Answer on the separate paper provided) .

Answer Question ONE and any other TWO questions .

Question 1: Read the following paragraph and then answer the set questions.

Enzymes are an important group of **proteins**. The brewing industry uses **enzymes** to make beer. A typical beer contains about 3% alcohol and nearly all the rest is water. The beer is made by a process called **fermentation**.

Yeast is added to a solution of sugary malt. Enzymes in the yeast change the sugar into alcohol. Enzymes work best at body temperature and so the solution needs to be kept warm. As well as alcohol, **a gas** is produced.

a. Give the chemical composition of PROTEINS. (2)

b. State three (3) reasons why proteins are important to living organisms. (3)

c. Describe the **test** you would perform to show that a typical food (example milk) contains proteins. (3)

d. What are enzymes? (2)

e. Apart from being proteins, give **three** (3) other characteristics of enzymes. (3)

f. Name the gas produced during the process of fermentation. (1)

g. Apart from beer manufacturing, name one (1) other economic use of enzymes. (1)

(total 15 marks)

2. a. Describe what is meant by:

i) Osmosis ii) Diffusion iii) Active Transport (2, 2, 2)

b. Describe an experiment to demonstrate the principle of either OSMOSIS or DIFFUSION (5)

c. Describe, with the help of a labelled diagram, the process of gaseous exchange in the alveoli. (4)

(total 15 marks)

3. a. State two (2) differences between '**Aerobic'** and '**Anaerobic'** respiration. (2)

b. Describe the mechanism involved during:

(i) breathing in (inhaling) and (ii) breathing out (exhaling). (3, 3)

c. Name two (2) features of an efficient respiratory surface. (2)

d. Describe briefly an experiment you would perform to demonstrate that 'Carbon Dioxide' is produced during respiration by small animals e.g. woodlice. (5)

(total 15 marks)

4. a. Describe the role/function of:

(i) the xylem (ii) the phloem. (1 , 1)

b. Draw an internal section of the root to show the positions of the xylem and phloem (2, 2)

c. List the main components of the human blood and give **one** function of each. (4)

d. Describe an experiment to show that the heart beat changes during exercise. (5)

(total 15 marks)

5. a. Write a balanced equation (in words or symbols) summarising the process of 'photosynthesis' (3)

b. Draw a large labelled diagram to show the internal cellular structure of the leaf. (5)

c. Name two (2) adaptations of the leaf to perform the process of photosynthesis. (2)

d. Describe an experiment to show that 'OXYGEN' is produced during photosynthesis (5)

(total 15 marks)