THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/1 **BIOLOGY 1**

(For Both School and Private Candidates)

TIME: 3 Hours ***Wednesday morning***
17/10/2007

Instructions

1. This paper consists of sections A, B and C.
2. Answer **all** questions in sections A and B and **one (1)** question from section C.
3. Read each question carefully before you start answering it.
4. Electronic calculators are **not** allowed in the examination room.
5. Except for diagrams which must be drawn in pencil all writings should be in blue/black ink or ball point pen.
6. Cellular phones are **not** allowed in the examination room.
7. Write your **Examination Number** on every page of your answer booklet(s)

This paper consists of 8 printed pages.

SECTION A (20 marks)

Answer **all** questions in this section.

1. For each of the items (i) – (x) choose the correct answer from among the given alternatives and write its letter beside the item number.

(i) An experiment usually tests

A application B hypothesis C method D data E evaluation

(ii) Figure 1 shows a palisade cell.

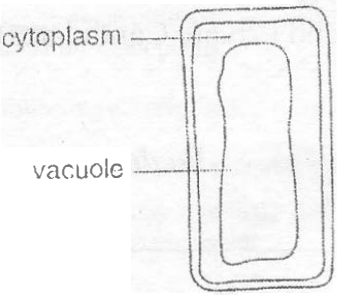

Fig. 1

What structures occur in the regions indicated?

	In the cytoplasm	In the vacuole
A	Chloroplasts	Nucleus
B	Chloroplasts and nucleus	Sap
C	Nucleus	Chloroplasts
D	Sap	Chloroplast and nucleus
E	Nucleus and sap	Chloroplast

(iii) Which substance in tobacco combines with haemoglobin to prevent the haemoglobin from carrying oxygen?

A Carbon dioxide B Carbon monoxide C Nicotine
D Tar E Cellulose fibre.

(iv) A plant with variegated leaves was completely destarched by placing it in a dark cupboard for 48 hours. Black paper was then fixed on one leaf as shown in Figure 2 below and the plant was exposed to the light. After 24 hours, which region of the leaf contained starch?

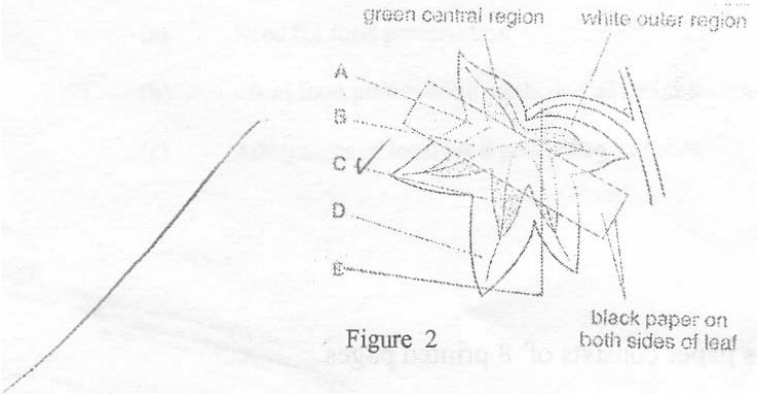

Figure 2

(v) In which condition must a plant be placed to show that a green plant releases carbon dioxide and why?

	Condition	Reason
A	Dark	To prevent photosynthesis
B	Dark	To prevent respiration
C ✓	Light	To allow photosynthesis
D	Light	To allow respiration
E	Light	To allow both photosynthesis and respiration.

(vi) The diagram below (Figure 3) shows a section through an alveolus and through a capillary passing around it.

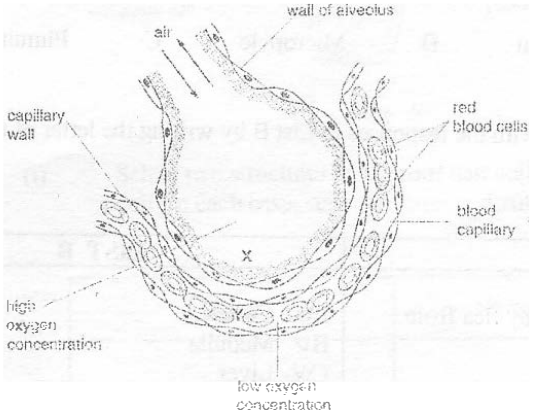

Fig. 3

How does oxygen move from X to Y? By

A diffusion B osmosis C translocation D active transport ✓
E transpiration.

(vii) Study the diagram below carefully (Figure 4).

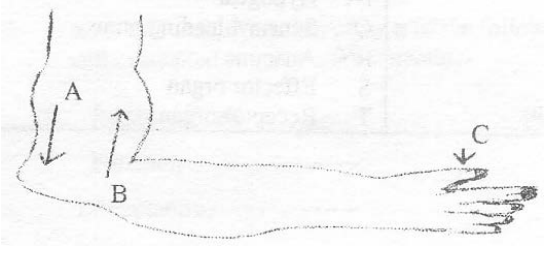

Fig. 4

What does A represent?

✓A Load (hand and forearm) B Effort (flexor of muscular upper arm)
C Fulcrum (elbow joint) D Pulley
E 1st class lever.

(viii) Which of the following substances is not a waste product in man?

A Faeces B Urine C Sweat D Carbon dioxide

E Urea.

(ix) Which hormones produced by the pituitary gland promote ovulation?

A Follicle stimulating hormone (FSH) and luteinising hormone (LH)
B Luteinising hormone (LH) and progesterone
C Oestrogen and progesterone
D Progesterone and follicle stimulating hormone (FSH)
E Prolactin and progesterone.

(x) Which part of a seed grows into the root system of a plant?

A Cotyledon B Micropyle C Plumule D Radicle
E Hilum.

2. Match the items in List A with the responses in List B by writing the letter of the correct response beside each item number.

LIST A	LIST B
(i) A disease transmitted by flea from rat to man	A Cortex
(ii) Transpiration	B Medulla
(iii) Causes change in body activity	C Liver
(iv) Outer zone of kidney	D Lung
(v) Panting in a dog	E Cooling effect in hot conditions
(vi) Care of pregnant woman before delivery	F Heating effect in cold weather
(vii) Cotyledons remain underground	G Prenatal care
(viii) Survival of the fittest	H Postnatal care
(ix) Detoxication of poisonous substances in the body	I Meningitis
(x) Vitamin C deficiency.	J Plague
	K Cooling effect on plants
	L Heating effect on plants
	M Darwin
	N Lamark
	O Epigeal
	P Hypogeal
	Q Scurvy/bleeding gums
	R Anaemia
	S Effector organ
	T Receptor organ

SECTION B (60 marks)

Answer **all** questions in this section.

3. Figure 5 shows a red blood cell and a root hair cell.

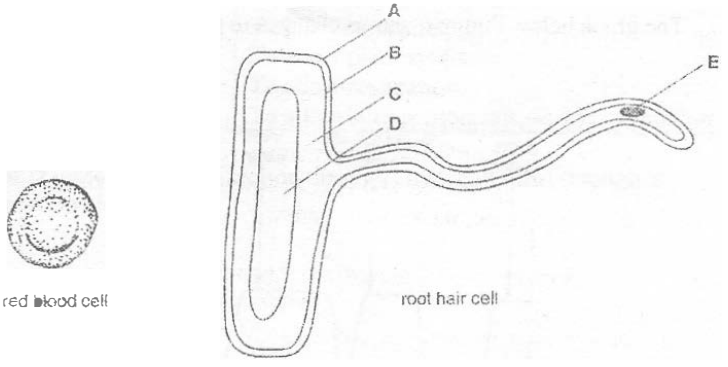

Fig. 5

(a) (i) Select two structures in the root hair cell which are also present in the red blood cell. In each case, state the letter and name of the structure.

Letter	Name of Structure

(ii) Name one structure which is typical of many plant cells which is not present in the root hair cell.

(b) State one major function of each of the following cells and describe one way in which the cell is adapted to carry out its function.

(i) Red blood cell

Function ----------

Adaptation ----------

(ii) Root hair cell

Function ----------

Adaptation ----------

4. (a) Name parts of the alimentary canal where

(i) digestion of starch takes place

(ii) absorption of the end products of digestion takes place.

(b) The graph below Figure 6 shows changes in pH in the mouth over a period of 10 hours.

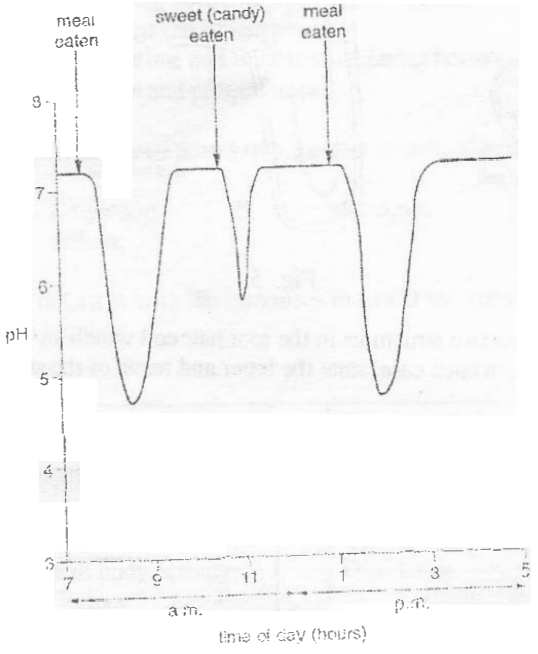

Fig. 6

(i) What is the pH in the mouth one hour after the meal that was eaten at 7.30 a.m.

(ii) Suggest the cause of increase and decrease of pH in the mouth between 8 a.m. and 9.30 a.m.

(iii) Suggest why the pH change after eating sweets is smaller than after eating meals.

5. (a) How could the body remove or destroy a bacterium that lands

(i) on the cornea (ii) on the hand (iii) in the bronchus

(iv) in the stomach?

(b) Explain why it is

(i) not healthy to sleep in a closed room with many potted plants.

(ii) dangerous to sleep in a poorly ventilated room with a charcoal burner on.

6. (a) (i) State the meaning of sexual reproduction. Figure 7 below shows the human male reproductive system.

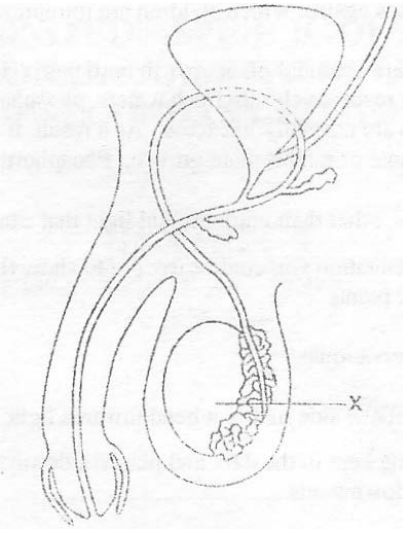

Fig. 7

(ii) Name the part labelled X and state two of its functions.

(b) (i) Birth control can be practised by surgery. Copy/draw Fig. 7 and mark clearly where such an operation should be carried out in a male human being.

(ii) Name two changes, other than those found on the sex organs which result from the effect of sex hormones.

7. (a) The following table shows the frequency of human blood groups in a population.

Human blood group	% frequency in the population
A	46
B	9
AB	3
O	42

(i) Plot the data in the table as a bar chart on the graph paper provided in your answer booklet.

(ii) What type of variation is illustrated by the data? Give reasons for your answer.

(b) A plant dispersed its seeds naturally. The seedlings formed were examined two weeks later. They were found to differ in height.

Suggest three environmental factors which caused the difference. **(8 marks)**

8. (a) (i) Define inununity.

(ii) Distinguish between naturally acquired immunity and artificially acquired iimnunity.

(b) Name four diseases against which children are immunized. **(8 marks)**

9. Nitrogen and phosphorus are essential plant growth nutrients. They are absorbed from the soil as nitrate and phosphate ions respectively. In fresh waters, phosphate ions occur in very small amounts while nitrate ions are normally in excess. As a result, it is the changes in the phosphate concentration which promote or inhibit plant growth. Phosphorus is therefore, a limiting nutrient.

(a) Name two factors, other than nutrients and light that can limit plant growth.

(b) Describe an investigation you could carry out to show that phosphorus is a limiting nutrient for water plants.

10. Explain the following observations:

(a) Lighting a shoot from one side makes it bend towards light.

(b) The shoot of a seedling kept in the dark and placed sideways (horizontal), grows upwards while its root grows downwards.

SECTION C (20 marks)

Answer **one (1)** question from this section.

11. State the cause and explain the transmission (where applicable) and preventive measures of the following health problems.

(a) Meningitis

(b) Cholera

(c) Malaria

(d) Bilharziasis.

12. Write an essay on natural resources using the following guidelines:

(a) Meaning of natural resources

(b) Types of natural resources including two examples of each case.

(c) Effects of man's activities on natural resources.

(d) Conservation of natural resources.

13. Food preservation is very important in human life. Discuss its importance under the following headings:

(a) Need for food preservation

(b) Local food preservation methods and their biological effects

(c) Advantages of local food preserving methods.