THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

NOVEMBER 1998

033/1 BIOLOGY PAPER 1

(For Both School and Private Candidates)

TIME: 3 Hours.

INSTRUCTIONS

1. This paper consists of Sections A, B and C. Answer ALL questions in Section A and B and ONE question from Section C.
2. All answers must be written in the answer book provided.
3. Write your centre and index number on every page of your answer book.
4. Except for diagrams, which must be drawn in pencil, all writing must be in blue/black ink or ball point pen.

FAILURE TO FOLLOW INSTRUCTIONS WILL LEAD TO LOSS OF MARKS.

This paper consists of 8 printed pages.

SECTION A

Answer ALL questions in this section. This section carries 10% of the total marks.

1. Items (i) - (x) consist of questions or incomplete statements followed by four suggested answers. Select the best answer in each case and write down its letter beside the item number as shown in the worked-out example.

Example: (i) Which of the following is an example of animal tissue?

A. Kidney
B. Skin
C. Blood
D. Heart

Answer (i) C

(i) The virus which causes poliomyelitis (polio) in human beings attacks

A. bone cells
B. nerve cells
C. muscle cells
D. white blood cells

(ii) Two plants that belong to different orders must also belong to different

A. Kingdoms
B. Divisions
C. Classes
D. Species

(iii) Which one of the following combinations of characteristics is true of insects and differentiates them from the rest of the animals?

L wings
M six legs
N jointed legs
O complete metamorphosis
P three body parts

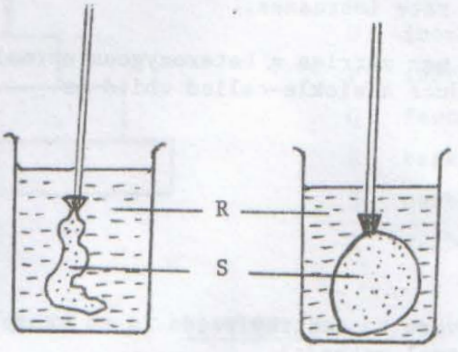
A. M, O and N
B. O, L and N
C. O, L and P
D. M, L and P

(iv) The irish potatoe stores food in the

A. stem
B. leaf
C. root
D. seed

1. Cont.

(v) An experiment was set up as shown in Figure 1 below. The bag containing S was made from a semipermeable material.



A: Beginning of experiment B: End of experiment

Fig. 1

The results shown in B would occur if

A. R and S are both distilled water

B. R is a dilute sugar solution and Z is distilled water

C. R is a weak sugar solution and S is a strong sugar solution

D. R is a strong sugar solution and S is a weak sugar solution

(vi) Which of the following statements about the lymphatic system is NOT correct?

A. Lacteals in the villi are part of the lymphatic system

B. Swellings or nodes act like the heart in that they push the limph around the body

C. Lymphatic system contains valves

D. Lymph nodes may become more swollen during illness

(vii) All respiratory surfaces

A. are always moist

B. have a blood supply for gaseous exchange

C. occur only inside the main body

D. are always in contact with the atmosphere

1. Cont.

(viii) When it is cold, one of the following happens to keep the body warm.

A. hairs of the skin lie down flat

B. warm blood flows close to the skin

C. the metabolic rate decreases

D. the metabolic rate increases.

(ix) If a sickle-celled man marries a heterozygous normal woman, the chance that they will produce a sickle-celled child is

A. 25%

B. 50%

C. 75%

D. 100%.

(x) The use of a herbivore to destroy weeds is an example of which of the following weed control methods?

A. Chemical

B. Cultural

C. Biological

D. Mechanical.

2. The following are matching items. Match the terms, statements or phrases in list A with those in list B by writing the correct letter of the term, statement or phrase in list B beside the corresponding item number in list A as shown in the worked out example.

Example	List A	List B
	(i) detoxifies poisons	Q liver
		R spleen

Answer: (i) Q

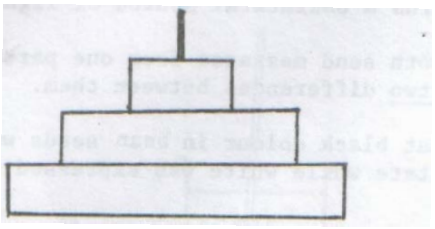
LIST A		LIST B	
(i)	prevents backflow of the blood from right ventricle to right atrium	A	mutation
(ii)	clay added to a sandy soil	B	genetic disease
(iii)	distinguishes birds from all other animals	C	special stem growing along the surface of the ground
(iv)	formed by yeast	D	underground stem with "eyes"
(v)	sudden appearance of heritable yellow eyes in a family	E	Homo Sapien
(vi)	runner	F	Homo sapien
		G	progesterone
		H	luteinizing hormone
		I	ecological pyramid

2. Cont.

(vii) human being

(viii) inhibits follicle stimulating hormone

(ix) survival of the fittest

(x) 

J food chain

K Darwin

L Lamarck

M tricuspid valve

N bicuspid valve

O increased aeration

P increased water holding capacity

Q feathers

R beak

S carbondioxide and water

T carbondioxide and alcohol.

SECTION B

Answer ALL questions in this section. This section carries 70% of the total marks. The marks allocation is indicated at the end of each question.

3. (a) (i) Name the three main parts of any cell.

(ii) Mention one function of each of the 3 parts.

(b) Give one example of each of the following in the human body

(i) the longest cell

(ii) a motile cell

(iii) a cell with strong contractile ability

(iv) a cell which moves and feeds like Amoeba. (8 marks)

4. (a) Give two ways in which insects are

(i) beneficial to man

(ii) harmful to man

Name the relevant insect in each case.

(b) Briefly describe two adaptations of

(i) tapeworms to their parasitic mode of life

(ii) xerophytes to their habitats. (10 marks)

5. (a) (i) What is breathing?

(ii) Describe the human breathing process.

(b) Explain why it is better to breathe through your nose than it is to breathe through your mouth. (10 marks)

6. (a) Name the hormone which performs each of the following functions

(i) reduction of blood glucose concentration

(ii) preparation of body for emergencies

(iii) stimulation of development of human male secondary sex characteristics at puberty

(iv) bending of a shoot towards a unilateral source of light.

(b) Nerve impulses and hormones both send messages from one part of the body to another. Write down two differences between them.

(8 marks)

7. (a) A plant breeder discovered that black colour in bean seeds was expressed in a heterozygous state while white was expressed in a homozygous state only.

Write down parental genotypes that could be crossed to give offspring that were

(i) all black

(ii) all white

(iii) 50% black and 50% white

(iv) all heterozygous black.

(b) What is a lethal gene? (8 marks)

8. (a) (i) Refer to the diagram below (Figure 2) showing the liver, its blood supply and connections with the gut. The arrow (→) shows the direction of blood flow.

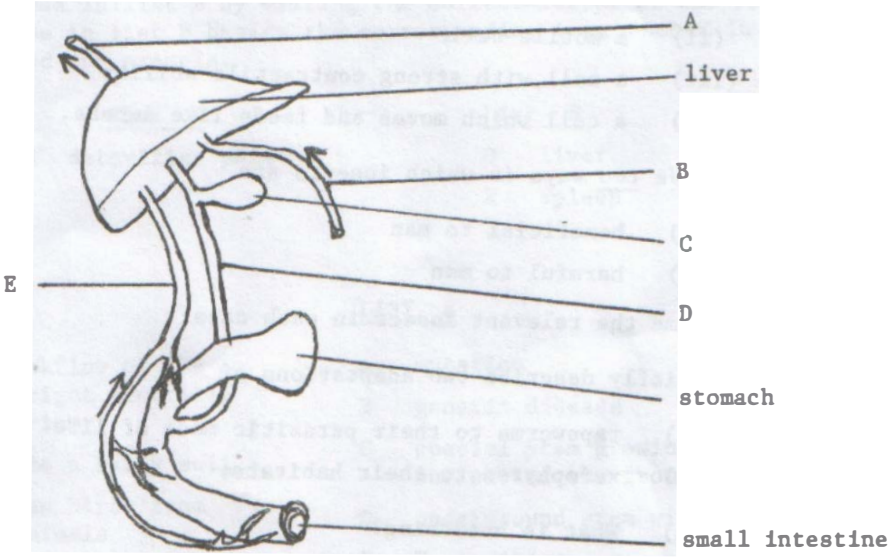


Fig. 2

8. (a) (i) Cont.

Match the labels of the diagram, A - E, with the following names:

hepatic portal vein

hepatic vein

hepatic artery

gall bladder

bile duct.

(ii) What role is played by the liver in digestion?

(b) Name the organ which

(i) produces urea

(ii) excretes urea. (8 marks)

9. (a) (i) Differentiate between long and short sightedness.

(ii) Briefly explain how each can be corrected. Illustrate your answer.

(b) Mention two functions of the skin. (12 marks)

10. (a) Distinguish between a parasite and a predator.

(b) Explain the meaning of the following ecological terms.

(i) Food chain

(ii) Food web

(iii) Community

(iv) Population (6 marks)

SECTION C

Answer ONE question from this section. Each question carries 20% of the total marks.

11. Suppose you were invited to take part in a debate the motion of which was "Scientists should find a way of getting rid of all bacteria." Write an essay to give your views on this motion.

12. Soil samples were collected from two potential farming areas, A and B, and were labelled A and B respectively. They were analysed in a soil laboratory for texture using the sense of touch and pH using simple colourimetry method. The intended crops for areas A and B respectively were potatoes (pH preference 4.5-6) and cabbages (pH preference 6.0-7.5). The results obtained were as shown in the table below.

Soil sample	Texture	pH
A	gritty feel when dry and wet	5.3
B	very hard when dry, sticky and plastic when wet.	5.5

(a) Suggest the textural names for each of the soil samples A and B.

(b) What are the characteristic problems of the soils in areas A and B.

(c) Suggest ways of making the soils in areas A and B suitable for the intended crops.

13. (a) What do you understand by the term pollution?

(b) With examples, discuss the causes and problems of air pollution and how it can be overcome.