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 November 03, 2004 a.m.**

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. Cellular phones are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).

This paper consists of 6 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) Cell walls

A give rigidity to plant and animal cells
B are made up of a layer of pectin
C are composed mainly of cellulose
D are a product of middle lamella
E surround all types of cells.

(ii) Green plants are known as producers because they

A produce chlorophyll in chloroplasts
B produce green leaves
C contain fruits and seeds
D grow in fertile soil
E make food from simple substances.

(iii) Figure 1 below represents

A cardiac muscle
B skeletal muscle
C involuntary muscle
D mycelium
E nervous tissue.

Figure 1

(iv) A human ovary produces ova and the following hormones

A oestrogen and testosterone
B progesterone and testosterone
C follicle stimulating hormone (f.s.h.) and progesterone.
D oestrogen and progesterone
E fsh and oestrogen.

(v) The following is a list of diseases caused by bacteria

A pneumonia, elephantiasis, cholera
B pneumonia, malaria, cholera
C bilharzia, cholera, pneumonia
D tuberculosis, pneumonia, small pox
E tuberculosis, pneumonia, cholera.

(vi) Which of the following parts of the germinating seed is an embryonic shoot?

A hypocotyl
B radicle
C plumule
D cotyledon
E endosperm.

(vii) A biologist discovered a new cell in a culture. The new cell had a distinct cell wall but did not have a definite nucleus. The cell is most likely to be

A fungi
B prokaryote
C protozoa
D virus
E eukaryote.

(viii) Oxygen debt occurs when

A too much carbon dioxide is present in the body
B the rate of respiration exceeds that of photosynthesis in green plants
C alcohol is formed in tissues
D there is insufficient oxygen in the muscle tissues during strenuous exercise
E there is insufficient lactic acid in muscle tissues.

(ix) If the magnifying power of the eyepiece lens of the compound microscope is × 10 and that of the high power objective lens is × 40, what is the magnification of a specimen under observation?

A × 10 B × 400 C × 50 D × 40 E × 500.

(x) What type of germination is represented by Figure 2 below?

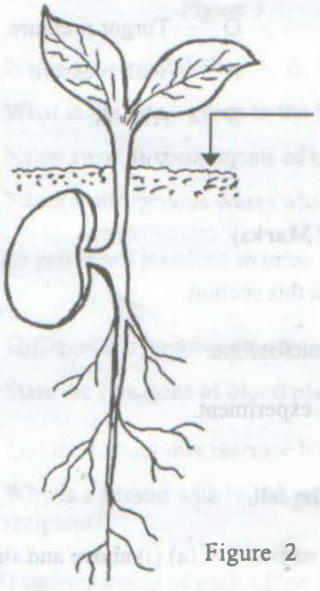


Figure 2

A Epigeal
B Hypogeal
C Tap-root
D Hypocotyl
E Apical.

2. Match the responses in **LIST B** with the words/phrases in **LIST A** by writing the letter of the correct response beside the item number.

LIST A	LIST B
(i) The pressure of the cell contents against the cell wall	A Biceps and triceps
(ii) Air sacs for gaseous exchange in mammals	B Cardiac muscle and skeletal muscle
(iii) Antagonistic muscles in a mammal's arm	C Cerebrum
(iv) Responsible for thought, memory, intelligence and judgement	D Cerebellum
(v) Involuntary muscle	E Mitosis
(vi) Spouse inheritance	F Meiosis
(vii) Amplify sound waves	G Responsible behaviour
(viii) Hair-like structures of moss that absorb water and nutrients	H Risk behaviour
(ix) Passage of urine from kidney to bladder	I Urethra
(x) Plays part in growth and asexual reproduction	J Ureter
	K Rhizoids
	L Roots
	M Auditory canal
	N Ossicles
	O Skeletal muscle
	P Smooth muscle
	Q Turgor pressure
	R Wall pressure
	S Alveoli
	T Villi

SECTION B (60 Marks)

Answer **all** questions in this section.

3. (a) State **four (4)** precautions for proper use of a microscope.

(b) Differentiate a test experiment from a control experiment. **(6 marks)**

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

(ii) Describe the structure of the parts named in 4 (a) (i) above and state the function(s) of each in the cell.

(b) How does a reflex action differ from tropism? **(10 marks)**

5. (a) (i) List the advantages of placental development for a developing foetus.

(ii) Explain why meiosis is needed in the life cycle of sexually reproducing organisms.

(b) What is the difference between alveolus and villus? **(7 marks)**

6. (a) What is the effect of

(i) farming alongside a dam?

(ii) spilling oil into a dam?

(iii) using nets with small mesh size in fishing?

(b) Outline **four (4)** ways of preventing soil erosion. **(7 marks)**

7. Study the diagram below (Figure 3), which shows a part of the human uriniferous tubule then answer the questions that follow.

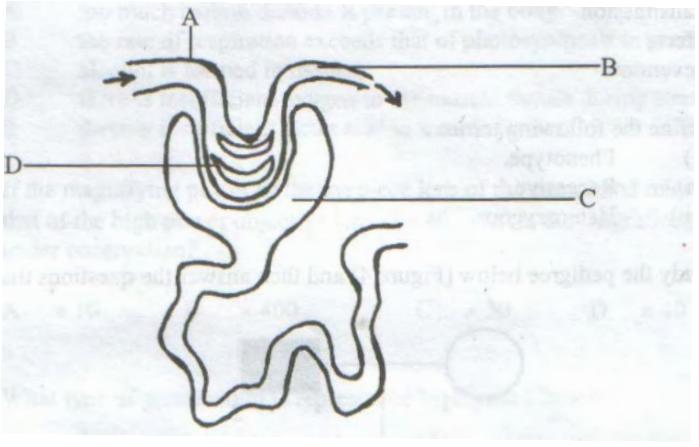


Figure 3

(a) (i) Name the parts labelled A, B, C and D.

(ii) What is the name given to the fluid labelled C?

(iii) Name **two (2)** components of blood that will not diffuse into the part labelled C.

(iv) Name a nitrogenous waste which is present in urine but absent in the part labelled B.

(b) List the processes involved in urine formation. **(8 marks)**

8. (a) (i) Differentiate lymphocytes from phagocytes.

(ii) State the functions of blood plasma.

(b) (i) List the factors that increase blood pressure.

(ii) Why is a person with blood group AB not always considered as a universal recipient? **(8 marks)**

9. State **three (3)** consequences of each of the following:

(a) STDs infections.

(b) Early pregnancies. **(6 marks)**

10. (a) State the significance of each of the following in organisms:

(i) Mitosis.

(ii) Meiosis.

(b) Compare and contrast mitosis and meiosis. **(8 marks)**

SECTION C (20 Marks)

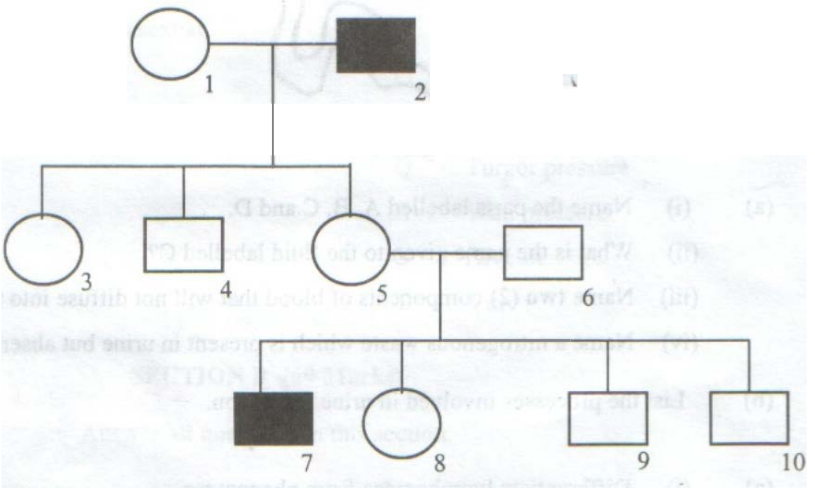
Answer **one (1)** question from this section.

11. If recycling of nutrients does not take place, the nutrients will not be available and the ecosystem will be disrupted. Give an account on Carbon cycle and show how it contributes to recycling of materials in nature.

12. Write an essay on cholera using the following guidelines:
    (a) Cause
    (b) Symptoms
    (c) Transmission
    (d) Effects
    (e) Prevention.

13. (a) Define the following terms:
    (i) Phenotype.
    (ii) Recessive.
    (iii) Heterozygous.

    (b) Study the pedigree below (Figure 4) and then answer the questions that follow.



Key:

= Females ◯ = Males □

Figure 4

Open figures indicate normal phenotypes; black figures indicate colour blind individuals.

(i) What is the probable genotype of 1?

(ii) Is the answer to (i) above 100 % certain? Explain.

(iii) What is the genotype of 5 and 9?

(iv) Justify your answer in (iii) above.

(v) If 3 marries a normal man, what are the chances that she will have a colour blind son? Illustrate your answer.