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 **2006/10/11 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 questions carefully before you start answering it.
4. Except for diagrams which must be drawn in pencil all writings should be in blue/black ink or ball point pen.
5. Electronic calculators are **not** allowed in the examination room.
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) Which of the following are the non-living parts of a cell?

A Cell wall and nucleus
B Cell wall and vacuole
C Cytoplasm and endoplasmic reticulum
D Cytoplasm and vacuole
E Cell wall and ribosomes.

(ii) Which one of the following is a group of animal tissues?

A Muscles, blood, nerve and epithelia
B Eye, muscles, skin and blood
C Cardiac muscles, skin liver and blood
D Blood, muscles, skin and kidney
E Liver, pancreas, lymph and ear.

(iii) Diabetes mellitus is associated with

A too much insulin in the blood
B too much glucose in the lymph
C high glycogen level in the blood
D under secretion of insulin in the blood
E too little glucagon in the blood.

(iv) The graph below (figure 1) shows changes in dry weight of the germinating seed.

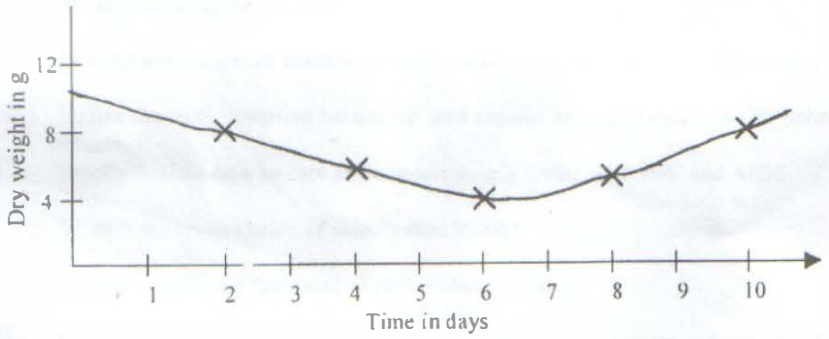

Fig. 1

The reasons for the decrease in dry weight and final increase in dry weight of the germinating seed are

A stored food being used for photosynthesis and increase due to respiration
B respiration from stored food and increase due to ability to make food by photosynthesis
C respiration from stored food and increase due to absorption of water
D excretion and respiration and increase due to absorption of water
E excretion and increase due to respiration.

(v) The best distinction between diastolic and systolic blood pressure is that

A diastolic blood pressure is caused by contraction of ventricles while systolic blood pressure is caused by contraction of auricles
B diastolic blood pressure causes blood from contracting auricles to flow into ventricles while systolic blood pressure causes blood from contracting ventricles to flow into pulmonary artery and aorta
C diastolic blood pressure is the same as systolic blood pressure. Therefore there is no distinction
D diastolic blood pressure is lower than systolic blood pressure
E diastolic blood pressure is common in females while systolic blood pressure is common in males.

(vi) Which of the following prevents surfaces of the articulating bones from being worn out by friction?

A Capsular ligament
B Synovial membrane
C Articular cartilage
D Tendon
E Synovial capsule.

Examine figure 2 below and answer the questions that follow:

Fig 2

(vii) Figure 2 represents a _____ of a small mammal.

A ventral view of cervical vertebra
B anterior view of thoracic vertebra
C anterior view of atlas vertebra
D side view of lumbar vertebra
E anterior view of caudal vertebra

(viii) The structure labelled A is called

A vertebrartetial canal
B posterior facet
C neural arch
D anterior facet
E neural spine.

(ix) Refer to figure 3.

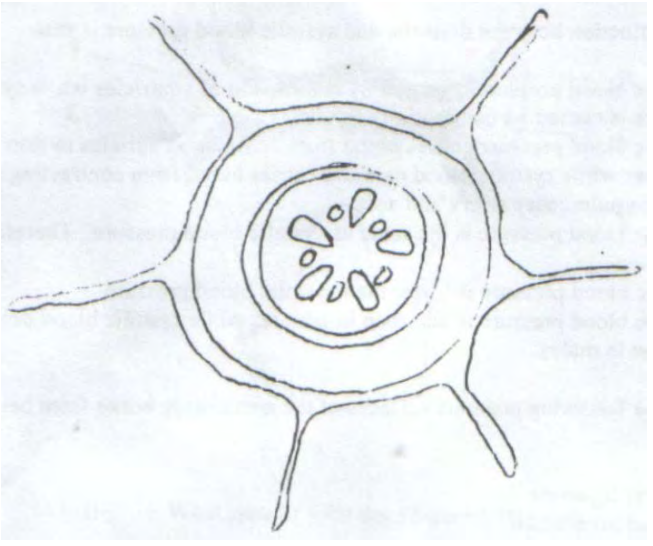

Fig. 3

Figure 3 is a

A transverse section through a monocot root
B transverse section through a dicot stem
C transverse section through a dicot root
D transverse section through a monocot stem
E longitudinal section of a dicot stem.

(x) Observe the punnet square below (figure 4).

♂ \ ♀	bc	bc
Bc	1	2
bc	3	4

Fig. 4

The possible gene combinations in square number 3 of figure 4 above is

A bcBc B bbCc C BbCc D Bbcc E bbcc.

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

List A		List B	
(i)	The ability of the body to resist infectious diseases	A	Diplotene
(ii)	The main nitrogenous product excreted by mammal	B	Zygotene
(iii)	Inheritance of acquired characteristics	C	Lamarckism
(iv)	Site for photosynthesis	D	Darwinism
(v)	A fatty material that insulates the neurone	E	Chloroplast
(vi)	Non-communicable reproductive tract disease	F	Mitochondrion
(vii)	The period of growth and development of a fetus in the uterus of a mammal	G	Immunity
(viii)	The observable characteristics of an organism which are genetically controlled	H	Vaccination
(ix)	An image behind the retina	I	Genotype
(x)	A stage in meiosis where exchange of genetical material takes place	J	Phenotype
		K	Myopia
		L	Hypermetropia
		M	Gestation
		N	Implantation
		O	Hydrocele
		P	Gonorrhoea
		Q	Myelin sheath
		R	Node of ranvier
		S	Uric acid
		T	Urea

SECTION B (60 marks)

Answer all questions in this section.

3. (a) Complete table 1 below by writing the location of the given joint in the body.

JOINT	LOCATION IN THE BODY
Hinge	
Ball and socket	
Pivot	
Gliding	

Table 1

(b) Study figure 5 below and answer the questions that follow:

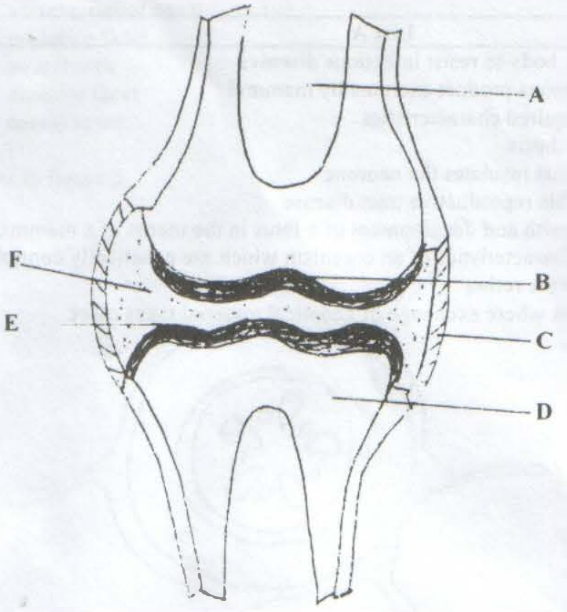

Fig. 5

(i) What type of joint does figure 5 represent?

(ii) Name the structures labelled A - F.

(iii) State the function of structure E. **(8 marks)**

4. (a) (i) Define the term mitosis.

(ii) Outline the significance of mitosis to organisms.

(b) Define the following terms and give an example of an organism where each takes place

(i) Complete metamorphosis.

(ii) Incomplete metamorphosis.

(iii) Ecdysis.

(c) Distinguish diffuse growth from localized growth and name kingdom(s) that exhibit each kind of growth. **(6 marks)**

5. (a) Explain the adaptation of lungs for gaseous exchange.

(b) What is the biological importance of shivering during cold weather?

(c) Explain why some trees are killed when a ring of bark is removed from their stems. **(7 marks)**

6. (a) By means of a suitable table show the source and role of the following mineral elements to the growth of plants and the deficiency symptoms for each element.

(i) Phosphorus. (ii) Nitrogen (iii) Calcium (iv) Iron.

(b) Name two enzymes in the human gut which break down proteins. In each case state the site of production, the substrate and products. **(11 marks)**

7. (a) Examine figure 6 and answer the questions below it.

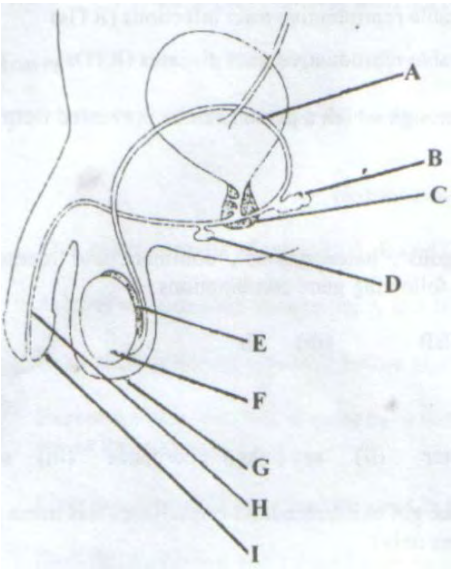

Fig. 6

(i) Name the structures labelled **A - I**.

(ii) State the functions of structures **F** and **H**.

(b) What does figure 6 represent?

8. (a) Name **four (4)** different types of consumers found in a natural ecosystem.

(b) Figure 7 below represents the pyramid of numbers.

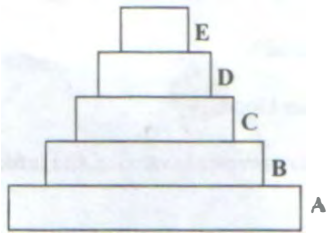

Fig. 7

(i) Place the following organisms in their appropriate trophic levels. Indicate by letters A - E. Algae, large fish, human being, small fish, zooplankton.

(ii) Give the name of the highest trophic level in this pyramid.

9. (a) How do cultural practices affect reproductive health in Tanzania? Explain your answer using two (2) cultural practices.

(b) Mention two (2)

(i) non-communicable reproductive tract infections (RTIs)

(ii) non-communicable reproductive tract diseases (RTDs).

(c) Outline four (4) ways through which a person can be prevented from infections of the reproductive system. **(6 marks)**

10. (a) State Mendel's first law.

(b) Use the words 'homozygous', 'heterozygous', 'dominant' and 'recessive' (where suitable) to describe the following gene combinations.

(i) Bb (ii) BB (iii) bb.

(c) Explain the meaning of

(i) sex limited character (ii) sex linked inheritance (iii) sex determination.

(d) A married couple has four girl children but no boys. Does this mean that the husband produces X-chromosomes only? **(8 marks)**

SECTION C (20 marks)

Answer one (1) question from this section.

11. (a) What does delaying sex mean?

(b) List the advantages of abstaining from sexual intercourse during adolescence.

(c) Define the term 'assertive behaviour' and explain its importance in a risk behaviour and situation.

(d) Briefly explain how to care and support people living with HIV and AIDS.

12. (a) What is the composition of mammalian blood?

(b) Explain clearly the functions of mammalian blood.

13. (a) Outline the ways by which the human body prevents invansion and infection by disease-causing micro organisms.

(b) Discuss the cause, mode of transmission and control of malaria.