

**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 05, 2003 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 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) The release of an egg cell from the ovary is known as

- A evolution
- B menstruation
- C ovulation
- D ecdysis
- E parturition.

(ii) Maintenance of a constant internal environment means

- A osmoregulation
- B excretion
- C reabsorption
- D homeostasis
- E secretion.

(iii) If a parent cell has twelve chromosomes, how many chromosomes will be in the daughter cells formed after meiosis?

- A Six (6)
- B Twelve (12)
- C Eighteen (18)
- D Twenty four (24)
- E Thirty six (36).

(iv) Viruses are considered to be non-living because

- A they are only active in the contents of a living cell
- B they have true nuclei
- C the body is covered by a cell wall
- D they are single-celled eukaryotic organisms
- E they are multicellular organisms.

(v) Study Fig. 1 carefully

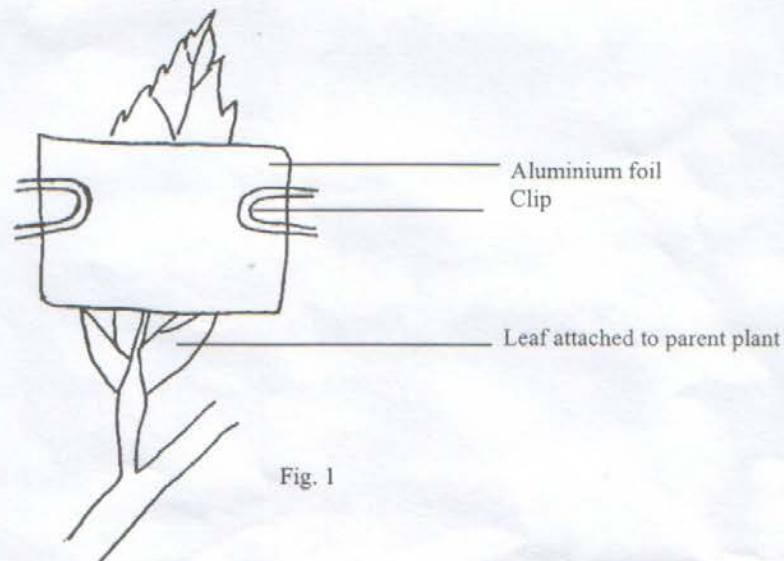


Fig. 1

The aim of the experiment was to investigate the

- A use of aluminium foil on plant leaves
- B necessity of chlorophyll for photosynthesis
- C necessity of light for photosynthesis
- D presence of starch in the leaf
- E importance of water in photosynthesis.

(vi) Which of the following joints allows movement in one plane only?

- A Ball and socket
- B Gliding
- C Hinge
- D Immovable
- E Gliding and immovable.

(vii) The stamen of a flower consists of

- A stigma and ovary
- B anther and stamen
- C filament and ovary
- D anther and filament
- E ovary and anther.

(viii) An experiment

- A always guarantees a scientific conclusion
- B should always be carried out in the laboratory
- C suggests a hypothesis
- D is valid only when it is carried out with a control
- E must start with a hypothesis and end up with the identification of a problem.

(ix) In which of the following tissues can rapid mitotic cell division be seen?

- A Nerve
- B Heart
- C Embryonic
- D Muscle
- E Epidermal.

(x) Which of the following series of activities take place together when focusing distant objects?

- A Ciliary muscles relax and the lens becomes thin
- B Ciliary muscles contract and the lens becomes thin
- C Ciliary muscles contract and the lens becomes thick
- D Ciliary muscles relax and the lens becomes thick
- E Ciliary muscles relax and pulls the lens into its normal round shape.

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

LIST A

- (i) A behaviour which has to be learned
- (ii) A sex linked disease
- (iii) A cross between the offspring and a homozygous recessive parent
- (iv) A structure connecting the foetus to the placenta in mammals
- (v) Variegated leaves.
- (vi) Blood capillaries within the Bowman's capsule
- (vii) Increase the surface area for absorption of digested food
- (viii) The ability of an organism to resist infection
- (ix) A bottle of perfume opened at one corner of the room is soon smelt at the opposite corner
- (x) Plants living under permanently low water conditions.

LIST B

- A. Xerophytes
- B. Mesophytes
- C. Diffusion
- D. Osmosis
- E. Resistance
- F. Immunity
- G. Ileum
- H. Villi
- I. Glomerulus
- J. Henle's loop
- K. Chlorophyll test
- L. Starch test
- M. Umbilical artery
- N. Umbilical cord
- O. Hybrid cross
- P. Test cross
- Q. Colour blindness
- R. Haemophilia
- S. Conditioned reflex
- T. Reflex action

SECTION B (60 marks)

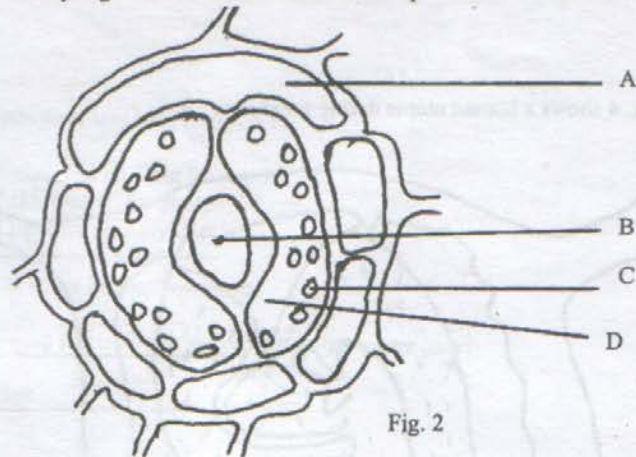
Answer ALL questions in this section

3. An ecologist carried out a survey to estimate the number of organisms in a certain dam. The results were as shown in table 1 below.

Type of organism	Estimated number of organisms
Microscopic plants	435,000
Small fishes	120
Mosquito larvae	4100
Crocodiles	12
Large fishes	80

- (a) Which of the above organisms are called
 - (i) producers?
 - (ii) primary consumers?
 - (iii) consumers of the last order?
 - (b) Which organisms are likely to be finished first in the dam? Give reason(s) to support your answer.
 - (c) Draw a food web to show energy flow among organisms in this dam. (5 marks)
- 4.
- (a)
 - (i) What is gaseous exchange?
 - (ii) Arrange the following in the correct order:
Bronchi, pharynx, bronchioles, nasal passages, alveoli, trachea.
 - (b) Name the structures concerned with gaseous exchange in
 - (i) a mammal
 - (ii) a young tadpole
 - (iii) an insect
 - (iv) an earthworm
 - (v) a spider
 - (c) What is the difference between the functions of a ligament and a tendon? (8 marks)

5. (a) Study Fig. 2 below and then answer the questions that follow.



- (i) Name the parts labelled A, B, C and D.
 - (ii) State the function(s) of D.
 - (iii) What is the main difference between guard cells and other epidermal cells?
- (b) How is the process of respiration different from burning? **(8 marks)**
6. Fig. 3 is a diagram of an imaginary cell. Observe the diagram and answer the questions that follow.



Fig. 3

- (a)
 - (i) How many chromosomes are there altogether?
 - (ii) How many pairs of homologous chromosomes are there?
 - (b)
 - (i) If this cell divides by mitosis, how many chromosomes will be in each daughter cell?
 - (ii) If the cell divides by meiosis how many chromosomes will each daughter cell contain?
 - (iii) If the cell divides by meiosis how many daughter cells will be formed?
- (5 marks)**

7. Fig. 4 shows a human uterus during pregnancy

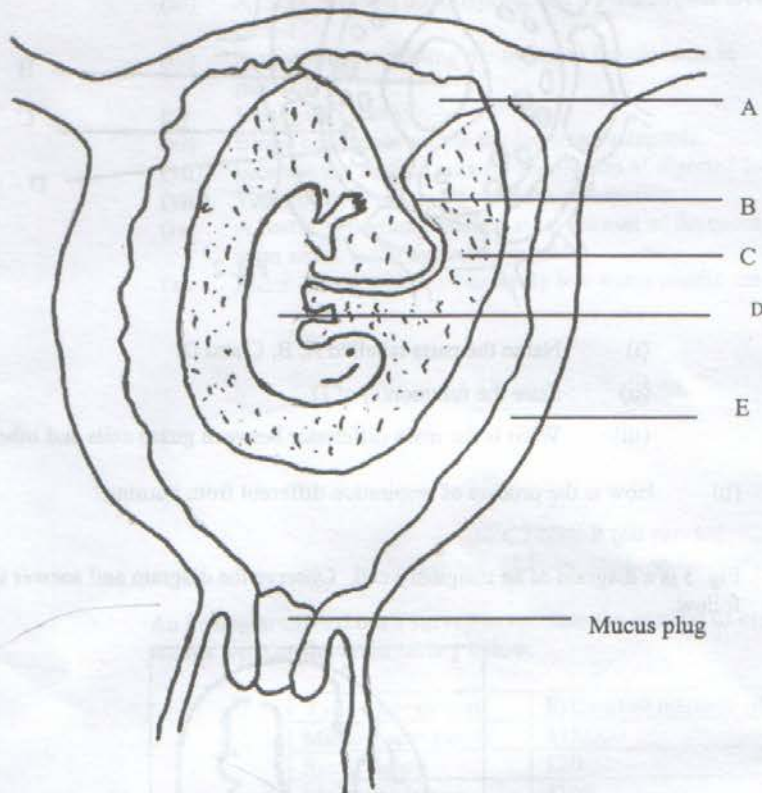


Fig. 4

- (a) (i) Name the parts labelled A, B, C, D and E.
(ii) Give ONE function of the parts labelled B and C.
- (b) (i) Name TWO substances that pass from the mother's blood to the blood of the foetus.
(ii) In what way(s) does a zygote differ from any other cell in the body?
(6 marks)

8. (a) (i) What are the characteristics of viruses?
(ii) How do viruses differ from bacteria?

8. (b) Study Fig. 5 below and then answer the questions that follow.

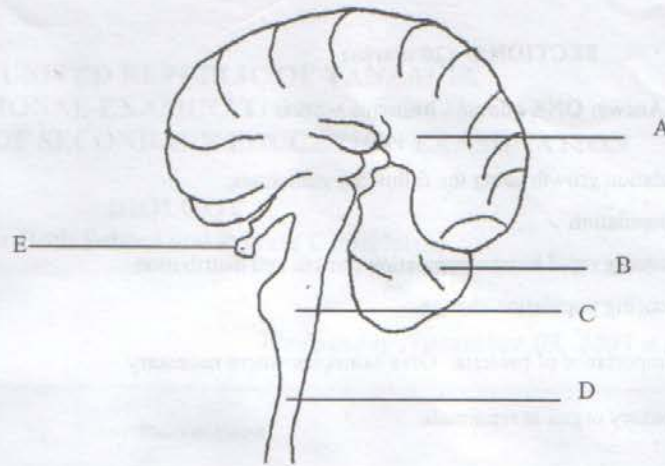


Fig. 5

- (i) What does Fig. 5 represent?
- (ii) Name the parts labelled A, B, C, D and E.
- (c) Arrange the following in the correct order for a simple reflex arc:
Impulse travels in motor fibre, impulse travels in sensory fibre, effector organ stimulated, receptor organ stimulated, impulse crosses synapse.
(10 marks)
9. (a) Differentiate between responsible behaviours and risky behaviours.
- (b) State two behaviours which may lead to the following risks:
- STDs
 - HIV infections
 - Drug abuse
 - Unplanned pregnancies
- (c) Suggest how victims of HIV/AIDS can be cared and supported. (7 marks)
10. (a) (i) Define osmosis.
- (ii) Does the presence of a cell wall prevent the process of osmosis? Give reason(s) to support your answer.
- (iii) How does osmosis differ from diffusion?
- (b) (i) Distinguish between phototropism and geotropism.
- (ii) Name the hormone responsible for tropic responses in plants.
- (iii) Name three diseases transmitted by polluted water. (11 marks)

SECTION C (20 marks)

Answer **ONE** question from this section

11. Write an essay on population growth using the following guidelines:
 - (a) Meaning of population
 - (b) Factors influencing rapid human population growth and distribution
 - (c) Factors influencing population change.
12. Discuss the economic importance of bacteria. Give examples where necessary.
13. Discuss the skin as a sensory organ in mammals.