

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

033/1

**BIOLOGY PAPER 1
(For Both School and Private Candidates)**

TIME : 3 Hours

4 November 1999 A.M.

INSTRUCTIONS

1. This paper consists of Sections A, B, and C. Answer ALL questions in Sections A and B, and ONE (1) question in Section C.
2. All answers must be written in the answer booklet provided.
3. Write your Centre and Index Number on every page of your answer booklet.
4. Except for diagrams, which must be drawn in pencil, all writing must be in blue/black ink or ball point pen.
5. Read each question carefully before you start answering it.

NOTE: The marks allocation for section B is indicated at the end of each question.

This paper consists of 8 printed pages

SECTION A

Answer ALL questions in this section. This section carries 20% of the total marks.

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

Example: A flower which possesses both stamens and carpels is said to be

- A monoecious
- B dioecious
- C bisexual
- D zygomorphic

Answer: (i) C

- (i) The central nervous system consists of

- A spinal nerves and sense organs
- B brain and spinal cord
- C spinal cord and spinal nerves
- D brain and neurones

- (ii) Tissue respiration may be defined as

- A the oxidation of food to release energy
- B taking in oxygen and giving out carbondioxide
- C breathing in oxygen and providing it to the tissue
- D getting rid of carbondioxide from the tissues.

- (iii) Which of the following activities take place together in the skin?

- A Vasodilation, sweating and shivering
- B Vasodilation, contraction of hair erector muscle and shivering
- C Muscle constriction, contraction of hair erector muscle and sweating
- D Vasodilation, sweating and relaxation of hair erector muscle.

- (iv) The immediate result of fertilization in a flowering plant is the formation of

- A zygote
- B seed
- C endosperm
- D embryo

(v) The flat body of a liverwort is known as

- A capsule
- B thallus
- C frond
- D rhizoid

(vi) Bow leggedness is a common feature in young children lacking one of the following vitamins

- A A
- B B
- C C
- D D

(vii) Preserved remains of ancient organisms are known as

- A old bones
- B old specimens
- C fossils
- D corpses

(viii) A sample of fertile soil was taken from a field and weighed. It was then heated in an oven for six hours, cooled in a dessicator and reweighed. Heating and reweighing were repeated until a constant weight was obtained. The results were as follows:-

original weight = 220 g

weight after heating

to constant weight = 198 g

The percentage water content of the original sample was

- A 10%
- B 20%
- C 25%
- D 90%.

(iv) The offspring of crosses between round rooted and long-rooted raddishes were always found to be oval shaped. This is an example of

- A crossing over
- B incomplete dominance
- C mutation
- D recessiveness.

(v) Which of the following organisms is a secondary consumer?

- A Termite
- B Rabbit
- C Cat
- D Bacterium

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

Example:

List A
(i) Fused pericarp and testa

List B
P. maize grain
Q. rice grain

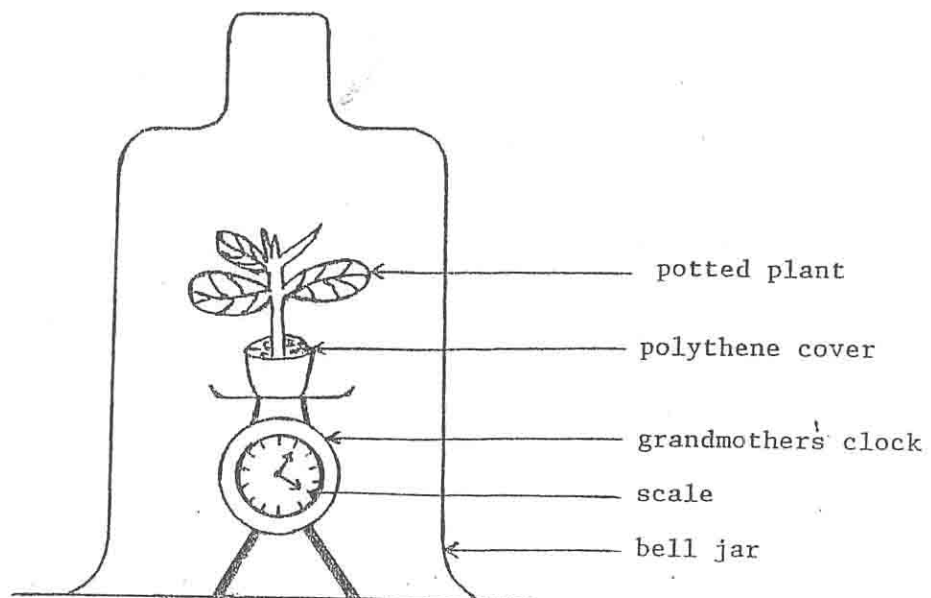
Answer: (i) P

- | | |
|---|-----------------------------|
| (i) Deamination of amino acids and urea formation | A. guard cell |
| (ii) Immunity found in young babies | B. epidermis |
| (iii) Reflect light rays in a microscope | C. banana |
| (iv) An egg laying mammal | D. pawpaw |
| (v) A fatty material which covers and insulates a neurone | E. kidney |
| (vi) A parthenocarpic fruit | F. liver |
| (vii) Ensures seed survival throughout drought | G. dormancy |
| (viii) Underactivity of the thyroid gland | H. germination |
| (ix) Controls the closing and opening of stomatal pores | I. natural passive immunity |
| (x) A cross between a hybrid organism and one of the original parental type | J. natural active immunity |
| | K. myelin sheath |
| | L. node of Ranvier |
| | M. spiny ant eater |
| | N. bat |
| | O. lens |
| | P. mirror |
| | Q. back cross |
| | R. test cross |
| | S. cretinism |
| | T. gigantism |

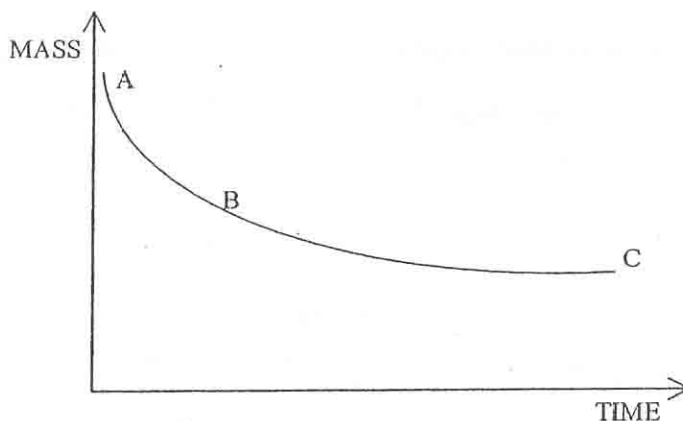
SECTION B:

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

- 3.(a) The study of Biology is important in our everyday life. Give two reasons to support this statement.
- (b) Classify the following organisms to class level giving one distinctive feature for each classification level.
- (i) Bean plant
 - (ii) Toad
- (8 marks)
- 4.(a) (i) Identify two common features present in a villus and alveolus.
(ii) Mention the roles played by each feature in the structures mentioned in a (i) above.
- (b) Explain what would happen if
- (i) the pituitary gland failed to secrete antidiuretic hormone (ADH)
 - (ii) red blood cells lost haemoglobin
- (11 marks)
5. (a) Briefly explain how leguminous plants deep-rooted plants, and shallow – rooted plants help to maintain soil fertility in crop rotation.
- (b) A set up for the experiment to investigate the rate of transpiration was put on the grandmothers' clock (weighing balance) and placed in the inverted bell jar as shown below.



Readings of masses from the balance scale were recorded after every 15 minutes interval. The graph of mass against time was plotted as shown below.



Explain what happened between

- (i) A and B
- (ii) B and C

(6 marks)

6. (a) Distinguish between exoskeleton and endoskeleton using the following subheadings.

- (i) position in the body
- (ii) composition
- (iii) examples of organisms in which they are found.

(b) Explain the biological significance of the following

- (i) webbed toes in amphibians
- (ii) branched tracheal system in insects
- (iii) streamlined body in aquatic organisms
- (iv) sunken stomata in xerophytes

(11 marks)

7. (a) Mention two functions for each of the following parts.

- (i) funicle in plants
- (ii) male urethra
- (iii) cerebrum

(b) Mr. Masatu brought a freshwater fish from Lake Victoria in his aquarium to Dar es Salaam. On arrival, he replaced the water in the aquarium with water from the Indian Ocean. After a short period, all the fish in the aquarium died. Explain why the fish died. (8 marks)

8. (a) What is a food chain?

(b) Below is a list of organisms occupying a certain habitat:

hawk, locust, hen, lizard and wild cat.

(i) Construct a food web using these organisms.

(ii) From the food web you have constructed, identify the different food chains.

(iii) Mention two groups of organisms which must be included in the food web to balance the ecosystem. (6 marks)

9. (a) Define the following terms:

(i) Guttation

(ii) Grafting

(iii) Parthenogenesis

(b) Mention the importance of fermentation to human life. (9 marks)

10. (a) Consider the following tissue and organs: meristem, paired fins, diaphragm. For each of these state:

(i) The organism in which it is found

(ii) The location in the organism

(iii) One role

(b) (i) Define the term pollution.

(ii) Incomplete combustion of fossil fuel produces gaseous substances like sulphur dioxide (SO_2), oxide of nitrogen (NO_x) and soot. Explain how and why each of these products is considered to be a pollutant. (11 marks)

SECTION C

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

11. (a) What do you understand by the term disease?
(b) Write an essay on the various methods by which human infectious diseases are transmitted.
12. (a) Draw and label a mammalian ear.
(b) Describe the mechanism of hearing in mammals.
13. (a) Mineral nutrients for plant growth can be added to the soil both naturally and artificially. Explain.
(b) Suggest natural ways through which mineral nutrients are lost.