

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

033/1

BIOLOGY PAPER 1

TIME: 3 hours

15 January 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 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.
5. Read each question carefully.

2
SECTION A

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

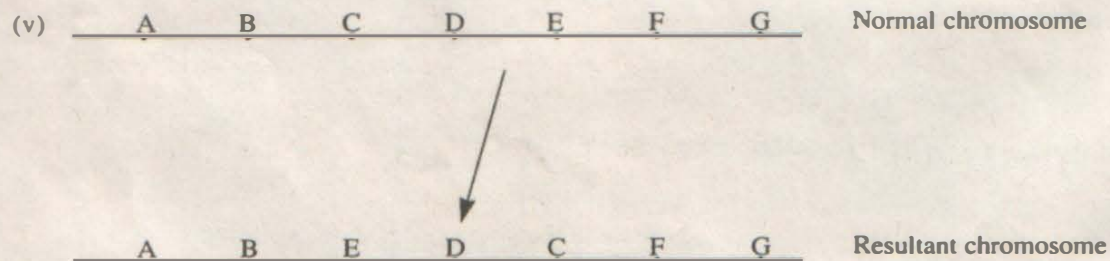
- I. Items (i) - (x) consists of questions or incomplete statements followed by four suggested answers. Select the best answer in each case and write down its letter beside the item number as shown in the worked out example.

Example: (i) A secretion containing enzymes which digest proteins and carbohydrates is

- A Bile
- B Pancreatic juice
- C Gastric juice
- D Saliva

Answer: (i) B

- (i) Which of the following arrangements shows cell organization in the correct order of increasing complexity?
A organelles, cells, tissues, systems, organs
B organelles, cells, tissues, systems, organ systems
C organelles, cells, tissues, organs, organ systems
D cells, organelles, organs, tissues, systems
- (ii) A flower which possesses both stamens and carpels is said to be
A monoecious B dioecious C bisexual D zygomorphic
- (iii) Which of the following hormones controls reabsorption of water from the urinary tubules when the amount of water in the blood is below normal?
A adrenaline B anti-diuretic hormone C acetyl-chlorine D oxytocin
- (iv) Which one of the following pairs of blood vessels carry oxygenated blood?
A pulmonary vein and umbilical artery
B pulmonary vein and umbilical vein
C pulmonary artery and umbilical vein
D pulmonary artery and umbilical artery



In the diagram above, the change of the normal chromosome into the resultant chromosome is called

- A linkage
 - B mutation
 - C translocation
 - D duplication
- (vi) Insects, earthworms and birds have certain organs in common. These are
A malpighian tubules as excretory structures
B cuticle or exoskeleton or scales as an outer covering
C nephrones which excrete uric acid
D crop, gizzard and gut
- (vii) In animal anaerobic respiration (in oxygen debt) the end products are
A carbon dioxide, ethanol and energy
B carbon dioxide, water and energy
C lactic acid and energy
D carbon dioxide and water

- (viii) Flexing of the forearm is brought about by
 A relaxation of the biceps and contraction of the triceps
 B relaxation of both biceps and triceps
 C contraction of both biceps and triceps
 D contraction of the biceps and relaxation of the triceps
- (ix) The development of unfertilized eggs of certain species of insects into adults is called
 A parthenogenesis B parthenocarpy C oogenesis D ovoviviparity
- (x) The offspring of two AB blood group parents will possibly be
 A group AB only
 B half of group A, half of group B
 C half of group AB, half of group A
 D of group A, AB and B

2. The following are matching items. Match the term 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 as shown in the worked out example.

Example:

- | List A | List B |
|--------------|---|
| (i) Chordata | C Presence of a notochord in embryonic stage or a vertebral column. |
| | D Presence of a cranium |
- Answer (i) C

- | LIST A | LIST B |
|--|---|
| (i) Homoiothermy | A Parenchymatous cells involved in the synthesis of organic molecules |
| (ii) AIDS | B Epidermal cells of the leaf |
| (iii) Mesophyll of a leaf | C Caused by a Retrovirus symptoms; skin cancer, brain damage, blood septicaemia |
| (iv) A symbiotic relationship where both organisms benefit | D Caused by a DNA virus, Symptoms: diarrhoea and tuberculosis |
| (v) Gametogenesis | E Increase in the number of body cells |
| (vi) Transpiration stream | F Formation of reproductive cells |
| (vii) Prevent yawing and rolling movement in fish | G Maintaining a constant body temperature |
| (viii) Hydrolysis | H Warm blooded animals |
| (ix) Pancreas | I Commensalism |
| (x) A unicellular fungus | J Mutualism |
| | K Building up of molecules by the addition of water |
| | L A chemical reaction in which large molecules are broken down by the addition of water |
| | M Yeast |

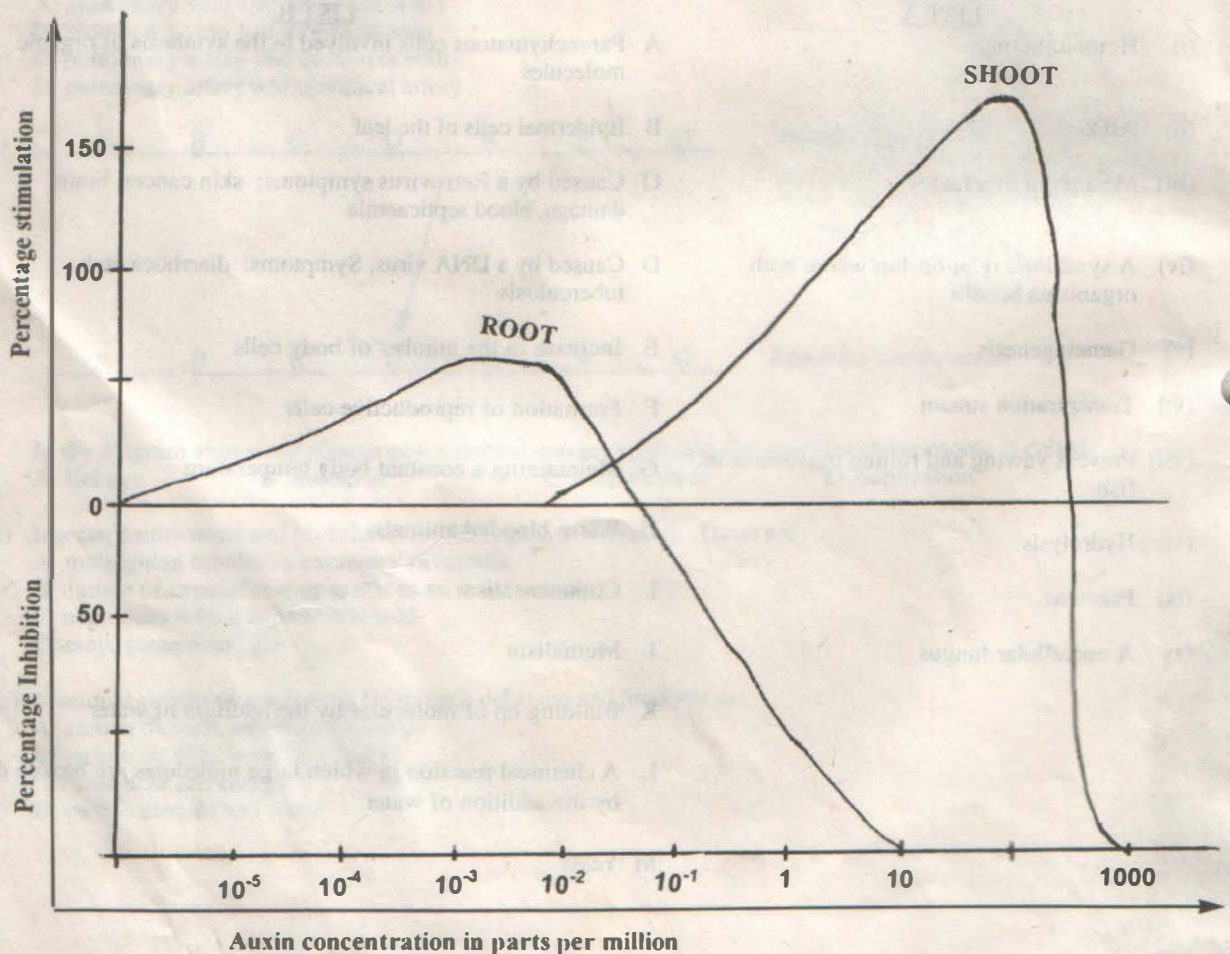
LIST B

- N. rhizobium
- O. caudal and pectoral fins
- P. dorsal and ventral fins
- Q. the flow of water through a live plant as a result of water loss through the leaves
- R. evaporation of water from the leaf surface
- S. a gland in the alimentary canal which secretes succus entericus
- T. a gland producing both hormones and enzymes

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. Study the graph below which shows the effects of auxin on the growth of the shoot and root.



- (a) Interpret the graph
- (b) Relate your interpretation in (a) above to geotropism in the shoot and root of a young beam seedling
- (c) (i) What is photolysis? (ii) What are the products of photolysis? (10 marks)

4. (a) Copy and complete the following table in your answer book.

| Organism | Kingdom | Division/ Phylum | Class |
|-------------------------|---------|------------------|-------|
| Earthworm | | | |
| Crocodile | | | |
| Duck | | | |
| Pine | | | |
| Bean | | | |
| Coconut | | | |
| Fish (<i>Tilapia</i>) | | | |
| Tapeworm | | | |
| Paramecium | | | |
| Plasmodium | | | |

- (b) What are the roles played by bacteria in the nitrogen cycle? (10 marks)

5. In the plant *Rosa alba*, a pure breed white flowered plant was crossed to a pure breed red flowered plant. All F_1 plants had pink flowers. When the pink flowered plants were selfed, offspring in F_2 had 102 plants with red flowers, 207 plants with pink flowers and 101 plants with white flowers.

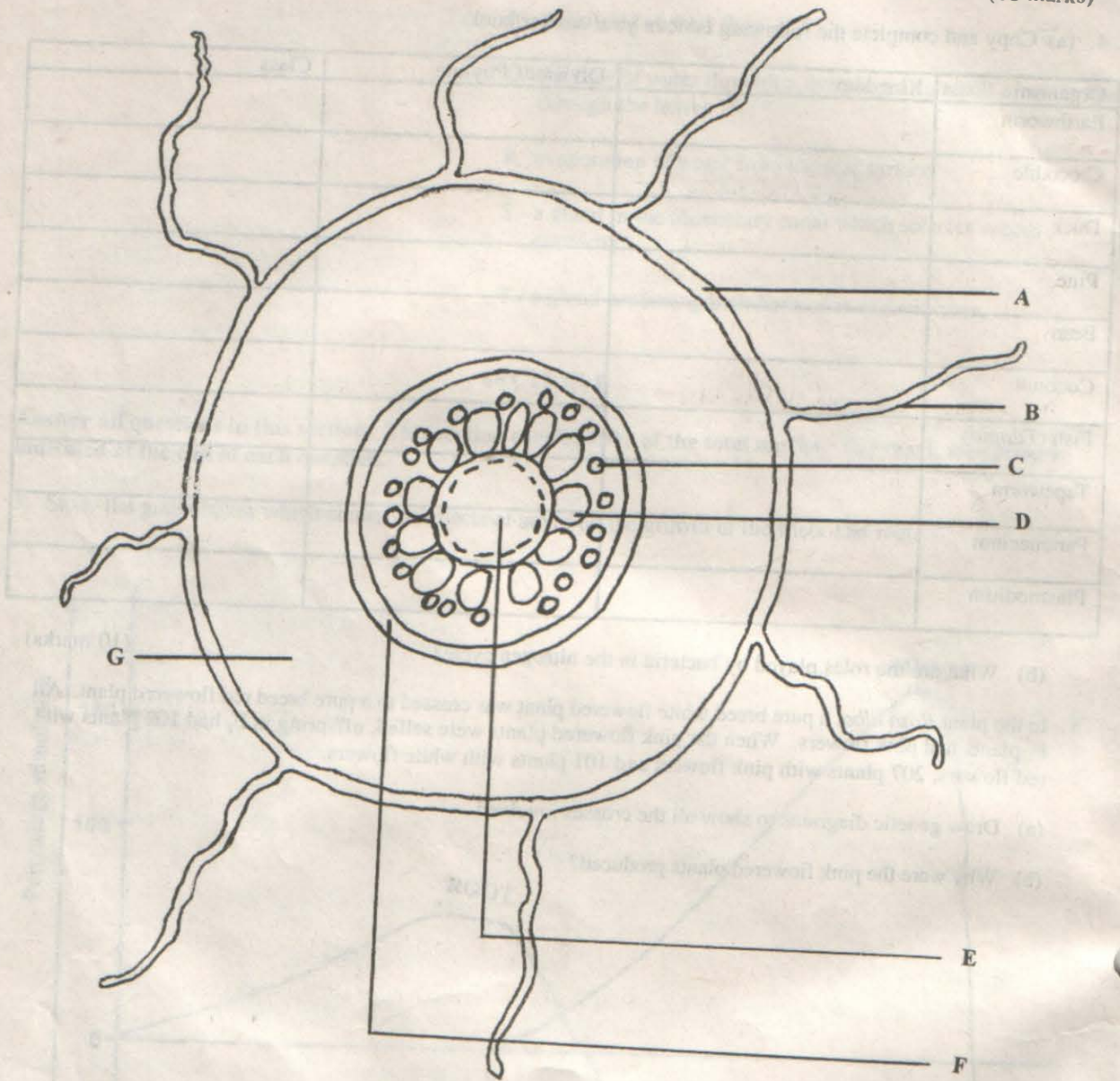
- (a) Draw genetic diagrams to show all the crosses involved.
- (b) Why were the pink flowered plants produced?

(c) Study the diagram below and

(i) label the parts arrowed by names to replace letters

(ii) what part of plant would this diagram represent?

(10 marks)



6. (a) (i) Name two blood vessels which carry blood to the liver.
(ii) What is the difference in composition of blood in the two blood vessels mentioned in 6 (a) (i)?
- (b) Distinguish between the following pairs
- (i) systemic circulation and pulmonary circulation
 - (ii) blood and lymph
- (8 marks)
7. (a) Give three reasons which account for the pyramidal energy transfer diagrams in any ecosystem.
(b) Distinguish between monoculture and crop rotation
- (7 marks)
8. (a) Outline the main events in the oestrous cycle of a mammal
(b) What is the difference between oogenesis and spermatogenesis?
- (8 marks)
9. Draw a diagram showing the arrangement of bones in a mammalian pentadactyl limb. (9 marks)
10. (a) What is the difference between marasmus and kwashiorkor?
(b) A food substance was heated with sodalime (NaOH/CaO). A gas was evolved which turned litmus paper blue. The gas smelled of urine. What is the nature of this food substance? (8 marks)

SECTION C

Answer one question only from this section which carries 20% of the total marks.

11. (a) What is a balanced diet?
(b) Write an essay on a balanced diet using the following guidelines
- (i) components of a balanced diet and their importance
 - (ii) deficiency diseases which may result when an individual lacks vitamin A, B and iodine
 - (iii) three factors which contribute to lack of a balanced diet among children in Tanzania.
12. (a) What are organic manures?
(b) What roles do they play in plant growth and soil fertility?
13. Discuss the major sexually transmitted diseases under the guidelines given below:
- (a) symptoms of the disease
 - (b) possible preventive measures.