

2528/103
2922/103
ENVIRONMENTAL BIOLOGY
June/July 2017
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN ENVIRONMENTAL SCIENCE AND TECHNOLOGY
MODULE I
ENVIRONMENTAL BIOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

answer booklet;

non-programmable scientific calculator.

This paper consists of TWO sections; A and B.

Answer ALL questions in section A and any THREE questions from section B in the answer booklet provided.

Each question in section A carries 4 marks while each question in section B carries 20 marks.

Maximum marks for each part of a question are as shown.

Candidates should answer the questions in English.

This paper consists of 3 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A (40 marks)

Answer ALL questions from this section.

1. Explain two problems encountered when using pyramid of numbers. (4 marks)
2. State four socioeconomic factors that limit family size in a static population of developed countries. (4 marks)
3. List four rules used in scientific naming of organisms. (4 marks)
4. State any four significance of mitosis. (4 marks)
5. Outline the four stages of mitosis. (4 marks)
6. List four reasons why plants do not utilize all the light energy available to them in photosynthesis. (4 marks)
7. Define the following terms:
 - (a) a gene; (2 marks)
 - (b) an allele. (2 marks)
8. Explain four ways in which human beings can interfere with nitrogen cycle in the ecosystem. (4 marks)
9. State the importance of the following parts of a neuron:
 - (a) dendrites; (1 mark)
 - (b) myelin sheath; (1 mark)
 - (c) axon; (1 mark)
 - (d) cell body. (1 mark)
10. Draw a labelled diagram of a plant plastid. (4 marks)



SECTION B (60 marks)

Answer any THREE questions from this section.

11. (a) With the aid of a diagram, explain four phases of population growth in an environment with limited resources. (14 marks)
- (b) (i) Name two characteristics of population growth in the absence of limiting factors. (2 marks)
- (ii) State four reasons for the rapid growth in human population in recent times. (4 marks)
12. (a) Define the term classification. (2 marks)
- (b) Name six key characteristics of insects. (6 marks)
- (c) Explain four ways through which a human body generates and conserves heat when it is cold. (12 marks)
13. (a) Describe five qualities of garden pea (*Pisum Sativum*) that makes it appropriate for use in genetic experiments. (10 marks)
- (b) Describe any five Mendel's pair of traits used in plant breeding experiments. (10 marks)
14. (a) With the aid of diagrams, explain the five types of point mutation in organisms. (15 marks)
- (b) Draw a labelled diagram of a DNA nucleotide. (5 marks)
15. (a) Describe six differences between endocrine system and nervous system. (12 marks)
- (b) Explain four chemical categories of hormones secreted by endocrine glands in human beings. (8 marks)



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