

2528/103
2922/103
ENVIRONMENTAL BIOLOGY
June/July 2016
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;

A non-programmable scientific calculator.

This paper consists of TWO sections: A and B.

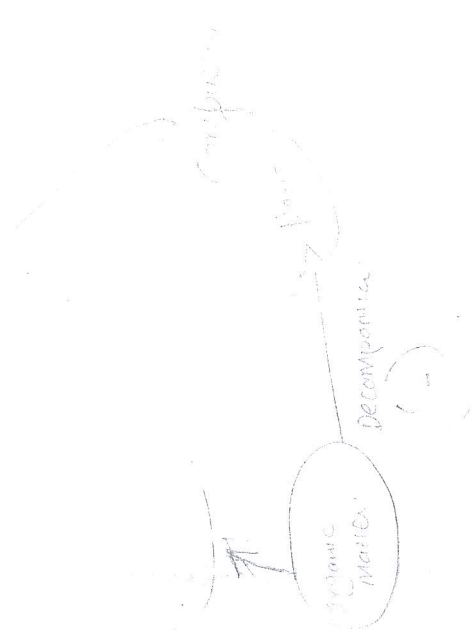
Answer ALL the questions in section A and any THREE questions from section B in the answer booklet provided.

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 in this section.

1. State four kingdoms composed of organisms with eukaryotic cells. (4 marks)
Animalia, Plantae, Fungi, Eukarya
2. Distinguish between classification and identification of organisms. (4 marks)
3. Name four levels of organization of human body starting with cells. (4 marks)
Cell - tissue - Organ - Organ system - Organism
4. Identify any four key features of molluscs that make them different from other organisms. (4 marks)
Two foot, two mantle, presence of body cavity, two gills
5. Draw the following patterns of plant cell wall thickening: (4 marks)
 - (a) Annular; 
 - (b) Spiral; 
 - (c) Scalariform; 
 - (d) pitted. 
6. Explain the regulation of glucose level in blood of a human body. (4 marks)
Insulin, Glucagon
7. Differentiate between chloroplasts and chromoplasts. (4 marks)
8. A deer is a mammal that lives in tropical deserts. It has large ears and is inactive during the day when temperatures are high. (2 marks)
 - (a) Explain the importance of the deer's large ears in the regulation of its body temperature. (2 marks)
 - (b) State any two activities that may raise the body temperature of the deer during the day. (2 marks)
9. State four environmental factors that determines variation in living organisms. (4 marks)
Temp, Genetic variation, Abiotic factors, Vegetation
10. State four observations made by Darwin concerning Natural Selection theory. (4 marks)

SECTION B (60 marks)

Answer any THREE questions from this section.

11. Explain five differences between continuous variation and discontinuous variations in living organisms. (10 marks)
the inheritance, genes, alleles, environment, discrete/continuous
12. Give any five reasons that make fruit fly (*Drosophila*) a suitable subject for genetic experiments. (10 marks)
easy to rear, short life span, large numbers, visible mutations, easy to cross
13. Describe the four kinds of organisms that live in aquatic system. (8 marks)
Marine, Freshwater, Estuarine, Pinnacles
14. State six benefits derived from the marine ecosystem in respect of the following: (6 marks)
 - (i) ecological;  (6 marks)
 - (ii) economic. (6 marks)
15. With the aid of a diagram, describe the structure of a neuron. (8 marks)
16. List six differences between nervous and endocrine systems. (12 marks)
Chemical vs electrical transmission, slower vs faster, local vs distant, specific vs general, open loop vs closed loop, reversible vs irreversible
17. With the aid of a diagram, describe the carbon cycle. (14 marks)
Photosynthesis, Respiration, Decomposition, Combustion
18. Explain three ways of improving soil fertility for increased crop production. (6 marks)
Practicing crop rotation, Compost farming
19. With the aid of diagrams, explain the three population growth survivorship curves. (14 marks)
20. Sketch a labelled diagram of a normal population growth curve. (3 marks)
21. Sketch the age structures for countries with the following population characteristics:
 - (i) Rapid growth; *Developing countries, Africa* (1 mark)
 - (ii) Zero growth; *Developed countries, Europe* (1 mark)
 - (iii) Negative growth. *Developed countries, Japan* (1 mark)

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