2528/103
2922/103
ENVIRONMENTAL BIOLOGY
Oct./Nov. 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** 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 the questions in this section.

1. Outline the criteria of writing scientific names of organisms. (4 marks)

2. Explain the **two** classes of Kingdom Plantae. (4 marks)

3. Define the following terms:

   (a) ecology; (2 marks)

   (b) ecosystem. (2 marks)

4. Explain the impact in a food web when the population of producers decreases. (4 marks)

5. Draw a well labelled diagram of chloroplast. (4 marks)

6. Explain any **two** significance of mitosis. (4 marks)

7. Name **four** means through which a human being looses heat during a hot day. (4 marks)

8. State **four** reasons for low energy transfer from secondary consumers to tertiary consumers in the food chain. (4 marks)

9. Outline the **four** main stages of nitrogen cycle. (4 marks)

10. Differentiate between Autecology and Synecology. (4 marks)

SECTION B (60 marks)

*Answer any **THREE** questions from this section.*

11. (a) Explain the **four** theories of the cell. (8 marks)

(b) With the aid of a labelled diagram, explain the structure of endoplasmic reticulum (ER) in a cell. (12 marks)

12. (a) Describe any **four** significance of fossils to evolution. (8 marks)

(b) Caroline has blood group A and her husband Sam, blood group B. Their daughter Sally has blood group O. Determine the genotypes of Caroline and Sam. (12 marks)

13. (a) Describe any **five** medical benefits of genetic engineering. (10 marks)

(b) State **four** potential benefits of genetically modified organisms. (4 marks)

(c) State **six** possible harmful effects of using genetically modified organisms. (6 marks)

14. (a) Explain **six** differences between a plant cell and an animal cell. (12 marks)

(b) Draw well labelled diagrams of the following tissues:

(i) squamous epithelial tissue; (2 marks)

(ii) cuboidal epithelial tissue; (2 marks)

(iii) columnar epithelial tissue; (2 marks)

(iv) stratified epithelia tissue. (2 marks)

15. (a) With the aid of a diagram, explain the population growth curve. (8 marks)

(b) Explain **four** Abiotic factors that affect population growth. (12 marks)

THIS IS THE LAST PRINTED PAGE.