

2528/303

-2922/303

ENVIRONMENTAL BIOCHEMISTRY AND
TOXICOLOGY

Oct./Nov. 2018

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN ENVIRONMENTAL SCIENCE AND TECHNOLOGY

MODULE III

ENVIRONMENTAL BIOCHEMISTRY AND TOXICOLOGY

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 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 the questions in this section.

1. State **four** health effects of asbestos used in roofing buildings. (4 marks)
2. Differentiate between local toxicity and systemic toxicity. (4 marks)
3. (a) Define the term ecotoxicity as used in toxicology. (2 marks)
(b) Explain the importance of ecotoxicity. (2 marks)
4. List **four** types of interactions resulting from combination of toxicants. (4 marks)
5. Name **four** processes that determines the amount of toxicants reaching the target site in an animal. (4 marks)
6. Differentiae between starch and glycogen. (4 marks)
7. List **four** physical properties of monosaccharides. (4 marks)
8. Draw the Fischer projection structure of:
(a) glucose; (2 marks)
(b) fructose. (2 marks)
9. Distinguish between glucogenic and ketogenic amino acid. (4 marks)
10. State **four** symptoms of scurvy caused by deficiency of Vitamin C in the human body. (4 marks)

SECTION B (60 marks)

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

11. (a) List five types of toxicants affecting the skin. (5 marks)
(b) Explain **five** mechanisms of absorption of toxic substances through the human cell membrane. (15 marks)

1270
-1245
1340
-1245
1145

12. (a) Explain five factors that affect biotransformation of harmful chemicals absorbed in the human body. (10 marks)

u x 100

(b) Explain how xenobiotics are eliminated from the human body through:

2000
5000
5,200

- (i) milk; (2 marks)
- (ii) nails; (2 marks)
- (iii) hair; (2 marks)
- (iv) skin; (2 marks)
- (v) cerebrospinal fluids. (2 marks)



13. (a) Explain five sources of natural pollutants in the environment. (10 marks)

Human activity, Biological, Physical, Chemical.

(b) (i) List any two sources of carbon monoxide. (2 marks)

0,000
3
20,000

17,500
3,000
11,500
14,000

(ii) Explain the effect of carbon monoxide when inhaled by human beings. (2 marks)

(iii) State four symptoms of carbon monoxide poisoning. (4 marks)

(iv) State two effects of inhaling low concentration of carbon monoxide for a longer period of time. (2 marks)

14. (a) Explain any four characteristics of pine tree bark that make it an ideal biomaker. (8 marks)

(b) Explain any six biological function of lipids in a human body. (12 marks)

15. (a) Explain four factors that affect enzyme activity in a biological reaction. (12 marks)

(b) Explain four significance of gluconeogenesis. (8 marks)

THIS IS THE LAST PRINTED PAGE.