

2528/104  
2922/104  
ENVIRONMENTAL LABORATORY  
PRACTICE  
June/July 2019  
Time: 3 Hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN ENVIRONMENTAL SCIENCE AND TECHNOLOGY

MODULE I

ENVIRONMENTAL LABORATORY PRACTICE

3 hours

**INSTRUCTIONS TO CANDIDATES**

*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. List **four** types of information displayed in chemical labels. (4 marks)
2. Name **two**:
  - (a) non-volumetric glassware; (2 marks)
  - (b) volumetric glassware. (2 marks)
3. Outline the first aid procedure administered to an accident victim that has sustained a small cut on his arm. (4 marks)
4. List any **four** sources of electrical faults in laboratory equipment. (4 marks)
5. Explain **two** types of film cameras. (4 marks)
6. (a) Define the term 'cryogenic liquids.' (2 marks)  
(b) Name any **two** common cryogens used in the laboratory. (2 marks)
7. List **four** characteristics of a chemical that make it a hazardous substance. (4 marks)
8. Distinguish between displacement vacuum pump and trapping vacuum pump. (4 marks)
9. State any **four** symptoms of asphyxia in humans. (4 marks)
10. State **four** functions of a preparation room in a laboratory. (4 marks)



**SECTION B (60 marks)**

*Answer any THREE questions from this section.*

11. (a) Outline the process of breeding mice for research studies. (12 marks)
- (b) Name the time lines labeled A, B, C, D, E, F, G and H of the breeding cycle of a rat and a mouse shown in table 1. (8 marks)

**Table 1**

ITEM	RAT	MOUSE
Estrous cycle	A days	E days
Gestation	B days	F days
Weaning age	C days	G days
Breeding age	D days	H days

12. (a) Explain five safety measures observed in storing gas cylinders in the laboratory. (10 marks)
- (b) State ten common causes of fires in laboratories. (10 marks)
13. (a) Explain five advantages of wood flooring in laboratories. (10 marks)
- (b) Explain five limitations of using concrete floor in a laboratory. (10 marks)
14. (a) Draw a labeled diagram of a Bunsen burner showing its flame. (6 marks)
- (b) Outline the procedure of lighting a Bunsen burner. (6 marks)
- (c) Draw a labeled diagram of a lathe machine. (8 marks)
15. (a) Define the term 'Dewars' as used in cryogenic chemicals. (2 marks)
- (b) Outline the procedure of transporting a cryogenic liquid using a lift. (8 marks)
- (c) Explain five hazards to humans exposed to cryogenic liquids in the laboratory. (10 marks)

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