

Name: _____ Index No: _____

2828/204
2922/204
ENVIRONMENTAL ANALYTICAL TECHNIQUES
AND LABORATORY MANAGEMENT
Oct/Nov 2012
Time: 3 hours

Candidate's Signature: _____

Date: _____



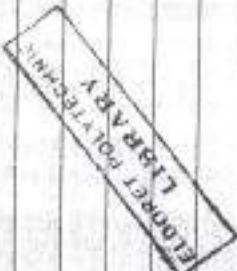
THE KENYA NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN ENVIRONMENTAL SCIENCE AND TECHNOLOGY
MODULE II

ENVIRONMENTAL ANALYTICAL TECHNIQUES AND LABORATORY MANAGEMENT

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.
Sign and write the date of examination in the spaces provided above.
You should have a Non-programmable Scientific Calculator for this examination.
This paper consists of TWO sections; A and B.
Answer ALL the questions in section A and any THREE questions from section B.
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 indicated.
Write all your answers in the spaces provided in this question paper.



For Examiner's Use Only

Section A	1	2	3	4	5	6	7	8	9	10	TOTAL
Question											
Marks											

Section B	11	12	13	14	15	TOTAL
Question						
Marks						
						GRAND TOTAL
						TOTAL

This paper consists of 16 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 (20 marks)

Answer ALL the questions in this section.

1. List any four desirable properties of a drying agent. (4 marks)

2. Identify any four requirements of a primary standard solid. (4 marks)

3. Distinguish between end point and equivalence point. (4 marks)

4. A 3.776 g sample of mercuric ointment is decomposed with nitric acid and on dilution, the mercuric (II) solution formed is titrated with 21.30 ml of 0.1144 M ammonium thiocyanate solution. Calculate the percent mercury (Hg = 200.59) given the equation below:



5. Outline the procedure used to obtain pure dry crystals from a hot solution by recrystallization technique. (4 marks)

6. Describe how ethanol can be obtained from a mixture of ethanol and water. (4 marks)

7. (a) Define the term management by objectives MBOs. (2 marks)

(b) State any two disadvantages of management by objectives. (2 marks)

Handwritten notes for question 7(b):
1. For a long time, the only way to measure performance was by comparing it to a target.
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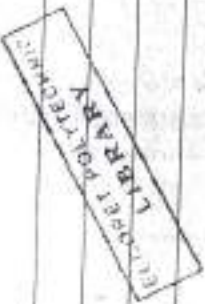
8. State any four benefits of performance appraisal to an organization. (4 marks)

9. Explain any two advantages of internal recruitment to an organization. (4 marks)

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10. List any four major areas of control as a management function. (4 marks)

SECTION B (60 marks)

Answer any THREE questions from this section in the spaces provided after question 15.

11. (a) A company's top management consists of a chief executive officer and four departments namely Accounts, Sales, Research and development and Human Resource management. Using an illustration, explain the organization structure of such a company. (10 marks)

(b) Explain any five benefits of good management to an organization. (10 marks)

12. (a) Explain the significance of each of the five types of needs in the Maslow's Hierarchy of needs theory. (10 marks)

(b) Explain any five reasons why people resist change in an organization. (10 marks)

13. (a) Given that solvents A and B are immiscible and that when solute X is shaken with the two solvents, it distributes itself between the two solvents; write down the distribution law in terms of A, B and X. (4 marks)

(b) Using an illustration, explain the multiple stage solvent extraction. (10 marks)

(c) An aqueous solution of succinic acid at 25°C containing 0.07 g in 10 ml is in equilibrium with an ether solution which has 0.013 g in 10 ml. Calculate the concentration of the ether layer which is in equilibrium with aqueous solution containing 0.024 g in 10 ml. (6 marks)

(a) Describe how 100 ml of 6 M HCl can be prepared from a stock solution of 37% w/w HCl having specific gravity of 1.18. (H = 1.0, Cl = 35.5) (10 marks)

(b) Explain how fruit juice can be extracted using Soxhlet extractor. (10 marks)

15. (a) State any four factors that govern retardation factor, Rf of a substance in paper chromatography. (4 marks)

(b) Describe wet packing of a column as used in column chromatography. (8 marks)

(c) Identify any four differences between Batch extraction and Continuous extraction. (8 marks)



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