



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

INSTITUTIONAL BASED PROGRAMME (DECEMBER SESSION)

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

(ENVIRONMENTAL HEALTH)

HEH 106: LABORATORY METHODS FOR ENVIRONMENTAL HEALTH

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DATE: THURSDAY 3RD MAY 2012

TIME: 4.30 P.M. – 6.30 P.M.

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INSTRUCTIONS

SECTION 1 (20 MARKS)

Answer ALL Questions

1.
 - a) State 4 criteria of a good solvent (2 marks)
 - b) Give 2 examples of buffering agents in nature (2 marks)
 - c) State the advantages and disadvantages of impactor samplers (3 marks)
 - d) Define the following terms as used in chromatography (3 marks)
 - i) Bonded phase
 - ii) Chromatogram
 - iii) Retention time
 - e) Explain the following terms as used in the laboratory (5 marks)
 - i) Chemical hazard
 - ii) Biological hazard
 - iii) Chemical waste
 - iv) Radiological hazard
 - v) Medical waste / sharp

- f) Explain the use of the following tools and equipments in lab methods (5 marks)
- i) volumetric flask
 - ii) pipet
 - iii) stirring rod
 - iv) utility clamp
 - v) wire gauze

SECTION II

This has two parts. Answer all questions in part 1, and any 2 in part II

PART I (20 MARKS)

2. a) Discuss various aspects of laboratory safety with special emphasis on
- i) Dress code (4 marks)
 - ii) Fire and cautions to fire (3 marks)
 - iii) Chemical substances and Large chemical spills (3 marks)
- b) With the aid of an illustration explain the following type of errors how they occur and how they can be minimized
- i) Random Errors (5 marks)
 - ii) systematic Errors (5 marks)

PART II (30 MARKS)

3. a) As an environmental health officer in charge of the environmental health laboratory how would you explain the following guidelines to chemical storage and handling to students visiting your lab. (10 marks)
- i) chemical handling
 - ii) shelves
 - iii) incompatible chemicals
 - iv) excessive storage
 - v) fume hoods
- b) Explain 5 examples of pH application in nature (5 marks)

4. a) An environmental health student on attachment at a water treatment plant was given the following data set on concentrations of fluoride in water in mg/l.
106, 105, 107, 108, 106, 105, 107, 108, 109, 103, 102, 106, 105, 103, 106, 104, 105, 105, 105, and 106. Calculate its mean, mode, median, range and standard deviation. (10 marks)
- b) Describe the process of cleaning laboratory glassware. (5 marks)
5. a) Discuss the following sampling methods giving their advantages and disadvantages
- i) Quota sampling (3 marks)
 - ii) Cluster sampling (3 marks)
 - iii) Simple random sampling (4 marks)
- b) Define the term gravimetric analysis and state its advantages and disadvantages. (5 marks)