ELIZADE UNIVERSITY, ILARA-MOKIN
FACULTY OF BASIC AND APPLIED SCIENCES,
DEPARTMENT OF PHYSICAL AND CHEMICAL SCIENCES
BIOCHEMISTRY OPTION
FIRST SEMESTER EXAMINATION

COURSE: BCH 407 (INSTRUMENTATION AND BIOANALYTICAL TECHNIQUES).
TIME ALLOWED: 2 HOURS

Instruction: Answer Question One (1) and any other two questions.

QUESTION 1

Given the table below showing research data from four biochemical analysis ([OH* hydroxyl radical], [NO* Nitric oxide radical], [DPPH* DiPhenylPicrylHydrazyl radical], [ACE (Lungs) - Angiotensin-1 Converting Enzyme in the lungs]) carried out in the laboratory on *Moringa oleifera* leaves extract, study the data perfectly and answer the following questions.

1. Give the table an appropriate title……..2 marks
2. If you are to draft a manuscript for publication or write project report using this data, what should the probable title of the manuscript/report?.....2 marks
3. Based on the EC_{50} values, interpret the result for each biochemical assay carried out……6 marks
4. Comment on the statistical difference in the NO* Nitric oxide radical scavenging assay result……..2 marks
5. If the dried leaves are to be packaged as tea and used as supplement by a hypertensive patient, which of the drying methods will you recommend? Give reasons for your answer relating ACE assay with hypentension……..8 marks.

	EC_{50} for Scavenging and inhibitory potentialss (µg/mL)			
Sample	OH*	NO*	DPPH*	ACE (Lungs)
Oven-dried	80.7 ± 1.8^{b}	100.1 ± 2.3^{a}	107.1 ± 4.0^{b}	86.8 ± 2.2^{b}
Sun-dried	71.9 ± 1.8^{a}	101.2 ± 1.8^{a}	92.3 ± 3.5^{a}	71.5 ± 1.9^{a}
Shade-dried	93.3 ± 2.2^{c}	121.9 ± 2.2^{b}	128.8 ± 5.2^{c}	116.8 ± 3.8^{c}

Values represent mean ± standard deviation (n = 3).
Values with the same superscript number on the same column are not significantly ($P<0.05$) different.

QUESTION 2

(a) (i) Briefly define Electrophoresis.....3 marks
(ii) Describe either SDS PAGE or Agarose Gel Electrophoresis and state the differences between the two.....10 marks
(b) Give a brief description of Thin Layer Chromatographic Technique.....7 marks

QUESTION 3

(a) List and write short notes on the two important parameters in light microscopy…4 marks
(b) With the aid of well labelled diagrams differentiate between the operational principles of Dark field and Phase Contrast microscope.....10 marks
(c) Differentiate between Scanning Electron and Scanning Probe microscope....6 marks

QUESTION 4

(a) Define (i) Beer's law……..2 marks
(ii) Lambert's law……..2 marks
(iii) Beer-Lambert's law……5 marks
(b) Briefly describe radioisotope tracer technique……5 marks
(c) With the aid of diagram only, describe how distribution of an element in the organism can be studied using a double stable tracer technique……..6 marks

QUESTION 5

(a) Write short notes on the following;
(i) Fermentation……..2 marks
(ii) Fermenter……..2 marks
(iii)Computer control of fermentation process…..2 marks
(b) List eight types of fermenters……4 marks
(c) Describe Continuous Stirred tank Bioreactor……10 marks