ELIZADE UNIVERSITY

ILARA-MOKIN

ONDO STATE

FACULTY: Basic and Applied Sciences
DEPARTMENT: Physical and Chemical Sciences
FIRST SEMESTER EXAMINATIONS
2019/2020 ACADEMIC SESSION

COURSE CODE: BCH 407

COURSE TITLE: INSTRUMENTATION AND BIOANALYTICAL TECHNIQUES

DURATION: TWO (2) HOURS

HOD's SIGNATURE

TOTAL MARKS:

Matriculation Number: _____

INSTRUCTIONS:

1. Write your matriculation number in the space provided above and also on the cover page of the exam booklet.
2. This question paper consists of 1 page with printing on both sides.
3. Answer all questions in the exam booklet provided.
4. More marks are awarded for problem solving method used to solving problems than for the final numerical answer.
5. Box your final answers. Marks will be deducted for untidy work.
6. At the end of this examination, place the question paper inside the exam booklet.
7. Answer Question One (1) and any other two questions.

ELIZADE UNIVERSITY, ILARA-MOKIN
FACULTY OF BASIC AND APPLIED SCIENCES,
DEPARTMENT OF PHYSICAL AND CHEMICAL SCIENCES
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).

Sample	EC$_{50}$ for Scavenging and inhibitory potentialss (µg/mL)			
	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 microscopy ... (4 marks)
(b) With the aid of well labelled diagrams differentiate between 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 Continous Stirred tank Bioreactor ... (10 marks)