



**CRAWFORD UNIVERSITY
FAITH CITY, IGBESA, OGUN STATE**

2012/2013 HARMATTAN SEMESTER EXAMINATIONS

COLLEGE: NATURAL AND APPLIED SCIENCES

DEPARTMENT: BIOLOGICAL SCIENCES

PROGRAMME: B.Sc BIOCHEMISTRY

COURSE CODE: BCH 315

UNIT:2

COURSE TITLE: TECHNIQUES IN BIOMEDICAL RESEARCH

STATUS: COMPULSORY

TIME ALLOWED: 2HOURS.

INSTRUCTION: ANSWER ANY FOUR QUESTIONS.

1 (a) Explain the theoretical principle of centrifugation and derive the equation for the sedimentation rate constant.

(b) Outline the experimental approach in sub-cellular tissue fractionation and enumerate the various cell components obtained.

(c) Give an account of the principle involved in affinity chromatography.

2(a) Explain concisely the principle and applications of electrophoresis

(b) Enumerate the factors which influence electrophoretic separation.

3 With the aid of a well labeled diagram, describe the principles and applications of Enzyme Linked Immunosorbent Assay (ELISA) in biomedical research.

4 Discuss the history, principles, procedure and application of Polymerase Chain Reaction (PCR) as a-molecular tool used in biomedical research laboratory.

5 A compound B ($200\mu\text{g/ml}$), an amino acid, was determined spectrophotometrically at 275nm . The table below shows the absorbance of different concentrations of 1ml dilutions of compound B at 275nm .

Concentration ($\mu\text{g/ml}$)	Absorbance
0	0.00
33	0.44
50	0.68
100	1.36
150	2.05
200	2.72
Unknown concentration (Sample)	1.62

(a) Calculate the volume of protein that should be added to the respective tubes to give the $\mu\text{g/ml}$ protein concentration for the standard curve.

- (b) With the data above, prepare a standard curve on the graph paper provided.
- (c) Determine the unknown concentration of B in $\mu\text{g}/100\text{ml}$.

6 Discuss FULLY the applications of spectroscopy in biomedical research.

CRAWFORD UNIVERSITY LIBRARY