



CRAWFORD UNIVERSITY
FAITH CITY, IGBESA, OGUN STATE
2022/2023 HARMATTAN SEMESTER EXAMINATIONS
COLLEGE: NATURAL AND APPLIED SCIENCES
DEPARTMENT: BIOLOGICAL SCIENCES
PROGRAMME: BIOCHEMISTRY
COURSE CODE: BCH 211

COURSE TITLE: CHEMISTRY AND STRUCTURE OF BIOMOLECULES
STATUS: COMPULSORY
TIME: 2 ½ HOURS
INSTRUCTION: ANSWER ANY FIVE (5) Questions.

- 1(a). Explain briefly the term Carbohydrates. [4 marks]
(b) Describe the structure of the following carbohydrates. Illustrate your answers with diagrams:
(i) Lactose (ii) Amylose (iii) Amylopectin (iv) Cellulose [8 marks]
- 2(a) Draw the Harworth perspective formulas of the α and β forms of the following aldoses and ketoses:
(i). Glucose (ii). Galactose (iii). Fructose (iv). Mannose (v). Ribulose [10 marks]
(b) What features distinguishes the two forms? [2 marks]
- 3(a) Explain five biological importance of Triacylglycerol [5 marks]
(b) Draw the structure of the following compounds:
(i) 1- Steroyl, 2- Oleyl-3-Phosphatidyl-Choline (ii) Triacontanoyl-palmitate (iii) Ceramide
(iv) Sphingomyelin. (v) Tristearin
(vi) 1- palmitoyl -2 stearoyl-3-myritoyl glycerol (vii) Glucocerebroside [7 marks]
- 4(a). Highlight four physical properties of fatty acids. [4 marks]
(b) Give the structural formulas of the following Fatty Acids; (i) Palmitic acid (ii) Oleic acid (iii) Eicosapentaenoic acid (EPA) (iv) Docosahexaenoic acid (DHA); [4 marks]
(c) Mention the site of synthesis of the following steroid hormones and their functions; (i) Testosterone (ii) Cortisol. [4 marks]
- 5(a) What are Proteins? [2 marks]
(b) Explain any five functions of proteins. [5 marks]
(c) Form a dipeptide with the following amino acids: (i) Glycine and Alanine (ii) Valine and Leucine [5 marks]
- 6(a) Differentiate between essential and non-essential amino acids and give two examples in each case. [3 marks]
(b) Classify the twenty common amino acids based on their degree of polarity. [5 marks]
(c) Give the structure of the following amino acids: (i) Valine (ii) Alanine (iii) Methionine (iv) Arginine [4 marks]
- 7(a) Define nucleic acids? [2 marks]
(b) Discuss the composition of nucleic acids. Illustrate your answer with diagrams. [5 marks]
(c) Draw the structural formula of the following molecules:
(i) Deoxyadenosine 5' monophosphate (ii) Deoxyguanosine 5' monophosphate (iii) Adenosine 5' monophosphate (iv) Cytidine (v) Uridine [5 marks]