

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS
EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF SCIENCE IN BIOCHEMISTRY

BIOC 203: BIOCHEMISTRY OF LIPIDS

STREAMS: BSC (BIOC)

TIME: 2 HOURS

DAY/DATE: TUESDAY 03/12/2019

8.30 AM – 10.30 AM

INSTRUCTIONS:

Answer question one and any other two questions

Question 1 (Compulsory) (30 marks)

- (a). (i) Give the structure of stearate and linoleate (2 marks)
- (ii) Which one of the above has a lower melting point? Justify your answer. (3 marks)
- (b). Give the structure of dipalmitoyl lecithin and explain its physiological importance (5 marks)
- (c). Describe the general structure of glycosphingolipids and explain the link between glycosphingolipids and human blood groups (O, A, B) (5 marks)
- (d). Describe the structure of arachidonic acid and explain how non-steroid anti-inflammatory drugs work. (5 marks)
- (e) (i) In triacylglycerides, to what molecule is fatty acids esterified to? Explain why triacylglycerol are the molecules of choice for energy storage in animals (3 marks)
- (ii) Define essential fatty acids and give an example. What are the two main functions of essential fatty acids? (2 marks)
- (f). State the physiological function of steroids derived from cholesterol (5 marks)

Question 2 (20 marks)

- (a). Give a brief account of the nomenclature of fatty acids and explain the difference between mono-unsaturated and poly-unsaturated fatty acids. (10 marks)
- (b). Describe the role of lysosomes in the degradation of phospholipids and sphingolipids (5 marks)
- (c). Describe the general structure of triacylglycerols. What is the difference between simple and mixed triacylglycerols? (5 marks)

Question 3 (20 marks)

- (a). Giving examples, classify lipids according to Bloor's way of classification (10 marks)
- (b). Draw the structure of phosphatidylethanolamine. Show its amphipathic nature (5 marks)
- (c). Briefly describe the general structure of waxes and give the functions and applications of specific types of waxes. (5 marks)

Question 4 (20 marks)

- (a). With specific examples, describe the structure and functions of eicosanoids. (10 marks)
- (b). Briefly describe the structure and physiological function of Cardiolipin. (5 marks)
- (c). Describe and structurally differentiate between gangliosides and cerebroside. Give their physiological importance. (5 marks)
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