



**TECHNICAL UNIVERSITY OF MOMBASA**

---

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

**UNIVERSITY EXAMINATION FOR:**

**BACHELOR OF TECHNOLOGY IN INDUSTRIAL MICROBIOLOGY AND**

**BIOTECHNOLOGY**

**ABT 4208: BASIC METABOLISM II**

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2 HOURS**

**DATE: Pick Date May 2016**

**Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

**Do not write on the question paper.**

---

**Question ONE**

1. (a) Describe the formation of malonyl-CoA (3 marks)
- (b) Outline the biosynthesis of phosphatidic acid from glycerol. (3 marks)
- (c) State the role of the following enzymes: -
  - (i) Thiolase
  - (ii) Hydroxymethyl-CoA (HMG-CoA) synthase (2 marks)
- (d) Define the following terms:-
  - (i) Ketosis
  - (ii) Lipogenesis (2 marks)
- (e) Outline FOUR functions of lipids (4 marks)
- (f) Outline biosynthesis of triacylglycerol from phosphatidate.

- (g) Name FOUR biomolecules synthesized from cholesterol. (4 marks)
- (h) Explain the sources of acetyl-CoA for fatty acid biosynthesis in the cytosol of animal cells. (2 marks)
- (i) Name the products of complete hydrolysis of one mole of lecithin. (2 marks)
- (j) Account for the number of ATP released by complete oxidation of stearic acid. (2 marks)
- (k) State the role of the following biomolecules in lipid metabolism:- (3 marks)
- (i) High density lipoprotein (HDL)
  - (ii) CDP – Diacylglycerol
  - (iii) Propionyl-CoA
- (3 marks)

### Question TWO

Discuss fatty liver disease (20 marks)

### Question THREE

Discuss degradation of a fatty acid with odd-numbered carbon atoms. (20 marks)

### Question FOUR

Describe the digestion, absorption and transport of triacylglycerols in the human body. (20 marks)

### Question FIVE

- (a) Explain the differences between fatty acid biosynthesis and  $\beta$ -oxidation degradation pathways. (10 marks)
- (b) Discuss the glyoxylate pathway. (10 marks)