CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

RESIT/SPECIAL EXAMINATION

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

BIOC 333: MICROBIAL METABOLISM

STREAMS: B.SC BIOC **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 11/08/2021 **8.30 A.M – 10.30 A.M.**

INSTRUCTIONS:

- **Answer Question ONE and any TWO questions.**
- **Do not write on the question paper.**

QUESTION ONE (30 Marks)

(a) Describe Methylglyoxal pathway highlighting its importance. (8 Marks)

(b) Describe the formation of Acetyl CoA from formaldehyde using serine pathway in methylotrophic bacteria. (9 Marks)

(c) Explain how Archaebacteria have modified glycolytic pathway to meet their cellular requirements. (6 Marks)

(d) Describe the butanediol fermentation pathway in bacteria. (7 Marks)

QUESTION TWO (20 Marks)

(a) Describe Stickland reactions between L-Glutamate and L-Glycine by *Clostridium species*. (8 marks)

(b) Distinguish between methanotrophs and methylotrophs. (4 marks)

(c) Discuss organic C-1 dissimilation by methylotrophs. (8 marks)

QUESTION THREE (20 Marks)

(a) Describe electron transport chain in bacteria during anaerobic conditions. (5 Marks)

(b) Using specific examples, discuss cyanobacteria photosynthesis. (15 Marks)

QUESTION FOUR (20 Marks)

(a) Define Chemoautotrophy. (2 Marks)

(b) Give five examples of chemoautotrophs. (10 Marks)

(c) Discuss heterotrophic methanogenesis. (8 Marks)
