

CHUKA



UNIVERSITY

SUPPLEMENTARY / SPECIAL EXAMINATIONS

**THIRD YEAR EXAMINATION FOR THE AWARD OF BACHELOR DEGREE IN
BIOC 333: MICROBIAL METABOLISM**

STREAMS: BIOC

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 18/11/2020

2.30 P.M - 4.30 P.M.

INSTRUCTIONS:

- (i) Answer Question ONE and any TWO questions
- (ii) Do not write on the question paper

QUESTION ONE (30 MARKS)

- (a) Methylglyoxal pathway operates as an alternate to the glycolysis when enteric bacteria experiences conditions of low inorganic phosphate concentration. Describe this 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 Halophilic Archaeobacteria have modified glycolytic pathway to meet their cellular requirements. (6 Marks)
- (d) Describe the amino acids 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 aerobic 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)
