

CRAWFORD UNIVERSITY
FAITH CITY, IGBESA, OGUN STATE

2020/2021 RAIN SEMESTER EXAMINATIONS

COLLEGE: NATURAL AND APPLIED SCIENCES

DEPARTMENT: BIOLOGICAL SCIENCES

PROGRAMME: MICROBIOLOGY

COURSE CODE: MCB 424

COURSE TITLE: MICROBIAL PHYSIOLOGY AND METABOLISM

COURSE UNIT: 3

TIME ALLOWED: 2HRS 30MINS

INSTRUCTION: ANSWER FIVE QUESTIONS IN ALL, AT LEAST TWO QUESTIONS FROM EACH SECTION.

SECTION A

Q1. Fully discuss the different factors affecting microbial growth and the possible classes to which microbes are grouped into based on these factors. 12 marks

Q2a. Write concisely on the microbial growth curve.

b. What is the consequence of exponential growth?

c. Calculate the generation time g and generation number n in a growth experiment in which a culture medium goes through exponential growth for 5 hours starting with a 5×10^6 cells/ml of *Escherichia coli* cells and reached a population of 5×10^9 cells/ml.

12 marks

Q3. Write concisely on the following:

i. Chemolithotrophy ii. Phototrophy iii. Macronutrients iv. Micronutrients. 12 marks

SECTION B

Q4. Write short notes on the following separation techniques;

i. Dialysis ii. Salting in and salting out iii. Differential centrifugation iv. High pressure Liquid chromatography 12 marks

Q5. Write concisely on the glycolytic pathway 12 marks

Q6.a. What are buffers? 2 marks

b. Briefly describe how the following buffers are prepared;

i. Acetic acid-Sodium acetate buffer ii. Citrate buffer iii. Carbonate-Bicarbonate buffer

iv. Phosphate buffer v. Potassium-Phosphate buffer 10 marks

Q7. a. What are enzyme assays? 2 marks

b. Write short notes on the techniques employed in the assay of the following enzymes;

i. Amylase ii. Lipase iii. Xylanase iv. Protease v. Pectinase 10 marks