ELIZADE UNIVERSITY, ILARA-MOKIN, NIGERIA

FACULTY: BASIC & APPLIED SCIENCES

DEPARTMENT: BIOLOGICAL SCIENCES

FIRST SEMESTER EXAMINATION

2018/2019 ACADEMIC SESSION

COURSE CODE: MCB 309

COURSE TITLE: MICROBIAL PHYSIOLOGY AND METABOLISM

DURATION: 2 HOURS

HOD's SIGNATURE

NAME:.....

MAT. No:.....

INSTRUCTIONS: Answer ANY four (4) questions.

1. a) Differentiate between the following:

   i) Enriched Media ii) Complex media iii) Chemically defined media

   iv) Selective media v) Differential media

   b) With the aid of diagram, explain the different phases of growth in a close system.

   c) Calculate the mean growth rate and generation time of a culture that increases in the exponential phase from 5×10^2 to 1×10^8 in 12 hours.

2. a) In transport of materials in and out of microbial cell, what is concentration gradient?

   b) What mechanism will a microbial cell use in transporting the following materials across the cell membrane?

   i) CO_2 ii) H_2O iii) O_2 iv) Glycerol

   c) i) What is a transporter?

   ii) Mention five (5) microbial products which are derivatives of metabolic activities.

3. Discuss the unique characteristics of the following microbes with relevant examples.

   i) Mesophiles ii) Psychrophiles iii) Thermophiles iv) Aerotolerant anaerobes

   v) Microerophiles vi) Acidophiles vii) Alkalophiles viii) Osmotolerants

   ix) Halophiles x) Neutrophiles

4. a) Draw a well-labelled diagram depicting Primary Active Transport in a microbial cell

   b) i) State three (3) types of active transport in microbial cell

   ii) Where does Kreb's cycle, Glycolysis and Electron Transport Chain take place in microbial cell?

   c) i) What are the sources of energy used in types of active transport mentioned in '2bi'?

   ii) Mention ALL the types of carrier proteins you know

5. a) In aerobic cellular respiration, what are electron acceptors?

   b) i) Mention five (5) compounds or elements that can be used as electron acceptors

   ii) Explain Chemiosmosis?

   c) i) In Glycolysis overall reaction, state ALL the reactants involved and products generated.

   ii) Glycolysis is catalysed by 10 different enzymes. Mention ANY three (3) you know

6. a) What are growth factors and their functions?

   b) Discuss the various transport mechanisms employed by micro-organisms