

OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, NIGERIA
FACULTY OF SCIENCE
DEPARTMENT OF MICROBIOLOGY

B.Sc. (Microbiology) Degree Examination.

Semester: Rain 2010/2011 Session

Date: 5th December, 2011

Course Code: MCB 306

Time Allowed: 2½ Hours

Course Title: Microbial Physiology and Metabolism

Instruction: Answer all questions with each section on separate answer booklets

SECTION A.

- 1 (a) A bacterium is capable of growth every 30 minutes. The number of cells in a culture of it is 1000 cells at the start of log phase. How many cells will be there after 5 hours of exponential growth?
- (b) Mention 3 factors in each case which influence the length of the following phases of bacterial growth
(i) lag (ii) logarithmic
- (c) Mention 1 similarity and 2 differences between the cell walls of gram positive and gram negative bacteria.
- 2 (a) Phospholipids are major components of bacterial cell membranes. Outline the steps involved in the biosynthesis of phospholipids.
- (b) Mention carrier molecules of importance in the biosynthesis of each of the following stating the specific role played by each of the carrier molecule.
(i) Peptidoglycan (ii) Fatty acid
- (c) In what way does the biosynthesis of purines differ from that of pyrimidines?

SECTION B.

- 1 (a) Mention the 12 precursor metabolites and in which pathway(s) can each be found in microbial metabolisms.
- (b) Define metabolism and state 3 important functions of metabolic pathways.
- 2 (a) Distinguish between fermentation and respiration in terms of electron donor and acceptor.
- (b) Mention other terminal electron acceptors apart from oxygen in anaerobic respiration.
- (c) What are the three electron carriers involved in electron transport chain?
- 3 Describe using detailed figure only, the Embden Meyerhoff Parnas (EMP) pathway and give 2 other names for this pathway.

SECTION C.

- 1 (a) Explain briefly the term enzyme kinetics
- (b) What are the factors that can affect enzyme kinetics?
- 2 (a) Describe briefly how enzymes can be extracted from various sources
- (d) Explain enzyme purification with adsorption chromatography technique