FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
MICROBIOLOGY DEPARTMENT
SECOND SEMESTER EXAMINATION, 2016/2017 SESSION
COURSE: Microbial Physiology and Metabolism (MCB323, 3Units)

Instructions: Answer **FIVE Questions** in All: **AT LEAST ONE** from each **Section**.

Time Allowed: $2^1/_2$ Hours

SECTION A

1(a). What is bacterial growth?
1(b). How can cells multiply when they have exhausted their supply of nutrients?

2(a). What happens when a stock culture stored in the refrigerator for several weeks is inoculated into fresh medium? Provide a suitable reason for your answer.
2(b). Briefly explain what happens if young cells are transferred to a medium similar in composition?

SECTION B

3(a). (i) What are the major pathways for energy generation in microorganisms?
(ii) Enumerate the steps in protein synthesis.
3(b). Describe the two sub processes involved in catabolism.
3(c). Distinguish between oxygenic and anoxygenic photosynthesis.

4(a). (i) What are the major components of electron transport chain?
(ii). Describe purine synthesis in bacteria.
4(b). Explain the term "anaplerotic pathway."
4(c). Discuss the functions of pentose phosphate pathway in heterotrophs.

5(a). (i). Describe the type 2 reaction center in photosynthetic microorganisms.
(ii) What are non-sense codes? List them.
5(b). What is the primary purpose of glyoxylate cycle in metabolism.
5(c). With examples distinguish between homofermenters and heterofermenters.

SECTION C

6(a). What is water activity?
6(b). How do hypotonic and hypertonic solutions affect microbial activities? Explain how microorganisms adapt to these environmental conditions?
6(c). Describe microaerophiles and facultative anaerobes.

7(a). How does a higher temperature above the optimum growth temperature of an organism affect its activities?
7(b). Describe how Coulter counter method is used to measure microbial growth.
7(c). Outline how anaerobic microorganisms can be cultured in the laboratory.