FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF LIFE SCIENCES
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION, 2016/2017 SESSION

COURSE CODE: MCB 311- GENERAL MICROBIOLOGY (3 UNITS)

INSTRUCTION: *Answer **ALL** Questions in **Section A** and **Any** 3 Questions in **Section B***

TIME ALLOWED: *2 hours only*

SECTION A

(i) Write the colour taken up by the underlisted cells and their Gram stain reactions.

Bacterial species	Cell Colour	Gram Positive/Negative
(a) *Escherichia coli*		
(b) Staphylococcus epidermidis		
(c) Staphylococcus aureus		
(d) Pseudomonas aeruginosa		
(e) Bacillus subtilis		

(ii) Explain the fundamental difference between a simple and a differential staining.
(iii) Describe the function of the following in Gram Staining
  (a) Primary stain
  (b) Decolourizer
  (c) Counterstain
(iv) What culture will you advise individuals to use in Gram staining?
(v) Briefly describe the mechanism of Gram staining
(vi) Name the primary stain used in acid fast staining procedure
(vii) What is the aim of heating/steaming during the acid fast staining?
(viii) In clinical microbiology laboratory, the acid fast staining would be used for diagnosis of ..... and .....
(ix) What makes a microorganism non-acid fast?
(x) ..... aims to preserve the shape of cells

(xi) When organisms are stained and background is left unstained, we refer to the staining as .....

(xii) ..... dyes are used for direct staining

(xiii) Commonly used simple stains are

(a) .....

(b) .....

(c) .....

(xiv) Presence or absence of metachromatic granules is demonstrated by ..... staining

(xv) ..... reagent is used in capsule staining

(xvi) ..... is used as primary stain in endospore staining

SECTION B

1a) Write short notes on the following: autoclave, mycorrhizae, eutrophication, chemotrophs, selective medium.

1b) With a relevant diagram, describe the life cycle of a named bacterium?

2a) Describe the lytic cycle of a t4 bacteriophage?

2b) If the magnification of the objective lens of a binocular microscope is 100x, what is its total magnification?

3a) In a tabular form, give 5 differences between Gram positive and Gram negative bacteria giving an example of each?

3b) What is the generation time of a bacterial population that increases from 10^4 cells to 10^7 cells after four hours of growth (Note: Log $10^7/10^4 = 3$)

4a) Write 5 distinguishing features between a prokaryote and a eukaryote?

4b) Write a short note on the metabolism of t4 bacteriophage?

5a Discuss DNA Homology experiment?

5b) Explain the interrelated parts of microbial taxanomy?

5c) Explain the two quality of bacteria classification and list the general methods of classification?