FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF LIFE SCIENCES
DEPARTMENT OF MICROBIOLOGY

FIRST SEMESTER EXAMINATION 2016/2017 SESSION

COURSE CODE: MCB 415
COURSE TITLE: MICROBIAL GENETICS AND MOLECULAR BIOLOGY (3 UNITS)
CLASS: 400 LEVEL
TIME: 2 HOURS

Instructions: Answer **Four Questions** in All; **Two** from each Section. Question one (1) is compulsory from section A.

SECTION A

AUG CUG AAA CCC AUG.....UAC CGA ACG UAA ACG GGG CUG ACC UUU

In the hypothetical gene shown above:

1(a). (i) Illuminate what will happen when there is a deletion of C from the codon CGA?
(ii). Produce the successive downstream codons.
(iii). What is the name of the mutation in ii?
(iv). State the two (2) new codons formed as a result of splitting the bases of the stop codon in the hypothetical gene above?
(v). State the new stop codon of the mutation in ii and make a distinction between the stop codon in the hypothetical gene above.

1—(b)

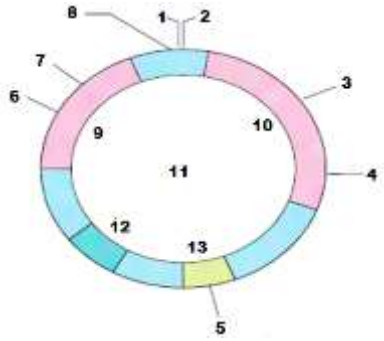

Figure 1

(i). As a student of microbial genetics and molecular biology, provide a suitable title for the above Figures 1.

(ii). Name 1-13 in Figure 1.

(iii). Divulge the universal significance of Figure 1 in microbial genetics and molecular biology. (To be answered in 15 words).

2(a). When mutations are established, what will happen to the offspring of chloramphenicol sensitive cells that mutate to chloramphenicol resistance? On rare occasion, however, the nucleotide will reappear to its previous state, resulting in the chloramphenicol resistant cells becoming chloramphenicol sensitive. Explicate briefly the phenomenon.

2(b). How many base pairs would have to be deleted in a mutational event to eliminate a single amino acid from a protein and not change the rest of the protein?

3(a). Assume the following base sequence was found in a 20 base DNA strand:
3^1 ATT CGA CCT TAT TAC TGC AC 5^1

(i). What would be the 10 bases in the 3^1 end of the complementary strand?

(ii). What would be the 10 bases in the 5^1 end of the complementary strand?

3(b). How can you artificially stimulate a bacterium in the laboratory to take up DNA fragments from the environment? (To be answered in 15 words).

SECTION B

4. Explain the major roles of RNA in the metabolism of prokaryotes.

5. DNA is an amphipathic molecule. Discuss.

6. Discuss the synthesis of ribosomal RNA.