CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD DEGREE OF BACHELOR OF SCIENCE IN

BMET 341: MOLECULAR BIOLOGY OF GENE

STREAMS: **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 4/12/2019 **8.30 A.M – 10.30 A.M**

INSTRUCTIONS

Answer question one and any other two questions

QUESTION ONE (COMPULSORY) 30 MARKS

1. (a) Briefly describe the genetic code. [6 marks]

   (b) State and explain the role of each of the two enzymes that are involved in DNA supercoiling. [4 marks]

   (c) Compare the structure and functions of DNA and RNA. [4 marks]

   (d) Highlight 4 agents that can cause damage to DNA. [4 marks]

   (e) Outline 4 steps and key players involved in base excision repair (BER) following DNA damage. [4 marks]

   (f) Ionizing radiation and certain chemicals can produce both single-strand breaks (SSBs) and double –strand breaks (DSBS) in the DNA back borne . Briefly describe processes by which such strand breaks are repaired. [4 marks]

   (g) Highlight 4 characteristics of plasmids which makes them good cloning vectors. [4 marks]

QUESTION TWO (20 MARKS)

(a) Discuss the process of DNA replication. [10 marks]

(b) Explain the process of translation. [10 marks]

QUESTION THREE (20 MARKS)

(a) Describe the 5 main stages in DNA Transcription. [10 marks]

(b) Discuss any five types of mutations. [10 marks]

QUESTION FOUR (20 MARKS)

(a) Describe the structure of the DNA double helix, including its subunits and the way in which they are bonded together. [10 marks]

(b) Outline the structure of RNA. [5 marks]

(c) Discuss the relationship between genes and polypeptides. [5 marks]
