



**UNIVERSITY OF EMBU**

**2017/2018 ACADEMIC YEAR**

**SECOND SEMESTER EXAMINATIONS**

**FIRST YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE,  
BACHELOR OF SCIENCE (MICROBIOLOGY, AND BIOTECHNOLOGY &  
BACHELOR OF SCIENCE (BIOCHEMISTRY)**

**SBC 105/ SBT 102: INTRODUCTORY GENETICS**

**DATE: APRIL 4, 2018**

**TIME: 2:00 – 4:00 PM**

**INSTRUCTIONS:**

**Answer ALL Questions in SECTION A and B, and ONE Question selected from SECTION C.**

**SECTION A: Multiple Choice Questions (1 Mark each).**

Please tick the correct answer.

1. What are alleles \_\_\_\_\_?

- two copies of a gene
- letters of a gene
- sex chromosomes
- the total genome content

2. Which one of the following is the odd one out with regard to the central dogma of genetics?

Replication

---

Transcription

Recombination

Translation

3. What are bacteriophages?

Viruses that infect bacteria.

proteins

types of nucleic material

unclassified bacteria

4. Plasmids exist as forms of extra chromosomal DNA in \_\_\_\_\_

Viruses

Bacteria

Bacteriophages

Human beings

5. Which of the following is true about viruses

They have both RNA and DNA as their genetic material

They do not contain some nucleic acids

They lack common shapes

None of the above

6. Which of the following is not a nitrogen base?
- Guanine
  - Adenine
  - Uracil
  - Murein
7. Which one of the following statements is false?
- DNA and RNA are both carriers of genetic material
  - Proteins are carriers of genetic material
  - mRNA gets its sequence from a DNA molecule
  - All of the above
8. Which of the following is a hereditary condition?
- Syphilis
  - HIV/AIDs
  - Sickle cell anemia
  - All the above
9. What is not true about a eukaryotic cell
- It has a true nucleus
  - It has a high DNA content
  - It has circular chromosomal DNA
  - It has linear chromosomal DNA

10. Which one is the odd one out?

Metacentric

---

Submetacentric

Polycentric

Acrocentric

11. The structure of DNA was discovered by \_\_\_\_\_

Calorimetry

Fluorometry

X-ray Crystallography

Flow cytometry

12. Which of the following is a DNA replication enzyme

DNA polymerase

DNA replicase

DNA terminase

All of the above

13. \_\_\_\_\_ is the odd one out?

Selection

Evolution

Recombination

Termination

14. What are telomeres?

- The joints in a DNA structure
- The ends of a chromosome
- The start points of a chromosome
- They are enzymes

15. What is a karyotype \_\_\_\_\_?

- A photograph of human chromosomes
- A group of genes
- Many protein sequences
- It's a group of enzymes

**SECTION B: SHORT ANSWER QUESTIONS (5 Marks Each)**

16. Outline the differences between a DNA and an RNA molecule

17. Discuss the principles of Mendelian inheritance

18. Describe the features of the genetic code?

19. What are the key characteristics of genetic material?

20. Outline the differences in the organization of genetic material in prokaryotes and eukaryotes

21. Explain the importance of the terms crossing over and recombination

**SECTION C: ESSAY QUESTIONS (25 MARKS EACH)**

**(Use the examination answer book provided).**

22. Describe the structure and chemical composition of a chromosome

23. Discuss the various patterns of inheritance.

24. Discuss the process of protein synthesis

**-END-**

