



EMBU UNIVERSITY COLLEGE
(A CONSTITUENT COLLEGE OF THE UNIVERSITY OF NAIROBI)

FIRST YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE AND BACHELOR OF SCIENCE (BIOLOGY)

SBT 102: INTRODUCTORY BIOCHEMISTRY AND GENETICS

DATE:

TIME:

INSTRUCTIONS: Answer ALL questions from **SECTIONS A and B** and **ONE** question from **SECTION C**

Note: Answer questions in **SECTIONS A and C** in the answer booklet provided.

SECTION A: Multiple choice questions (15 minutes, 1 mark each)

Please tick in the box of the correct answer

1. Which of the following is not a protein base of the DNA molecule
 Adenine
 Uracil
 Thymine
 Guanine
2. The type of cell division that results to each of the two daughter cells having the same number of chromosomes as the parent cell is called
 Meiosis
 Metaphase
 Mitosis
 Anaphase
3. Which of the following refers to the physical appearance of an organism
 Genotype

- Zygoty
- Phenotype
- Homozygote

4. An offspring refers to
- The first generation of a cross
 - The second generation of a cross
 - The resultant of sexual mating
 - An egg or sperm
5. Which of the following is not one of the stages of cell division
- Anaphase
 - Metaphase
 - Telophase
 - Meiosis
6. Which one among the terms below refers to the phenomenon in which several distinct and unrelated characteristics are associated with a single gene
- Polymorphism
 - Pleiotropy
 - Complete dominance
 - Lethality
7. Absence of hexosaminidase A enzyme in lysosomes is associated with which disease
- Cystic fibrosis
 - Leukemia
 - Tay-sachs
 - Friedreich ataxia
8. The following are examples of gametes except
- Sperm cells
 - Pollen
 - Chromosomes
 - Ova
9. Which among the following does not refer to a type of amino acids
- Common amino acids
 - Polar amino acids
 - Non polar amino acids
 - Acidic amino acids

10. Which of the following amino acids occurs only in proteins

- Hydroxyproline
- Serotonin
- Histamine
- Adrenaline

11. The following are structures of proteins except

- Regular structure
- Secondary structure
- Tertiary structure
- Quaternary structure

12. Below are techniques that can be used for protein purification except

- Dialysis and ultrafiltration
- Crude extraction
- Gel filtration chromatography
- Affinity chromatography

13. Carbohydrates can be grouped into the following except

- Oligosaccharides
- Simple sugars
- Multisaccharides
- Polysaccharides

14. The following disaccharides are commonest in nature except one

- Lactose
- Sucrose
- Glucose
- Maltose

15. The following are biochemical processes except

- Photosynthesis
- Respiration
- Metabolism
- Ingestion

SECTION B: SHORT ANSWER QUESTIONS (30 minutes, 5 marks each)

Your answers should be brief and to the point (Use the examination answer book provided).

1. Describe the 5-carbon sugars found in DNA and RNA
2. Distinguish between a homozygote and a heterozygote
3. Briefly explain dihybrid cross
4. Explain the differences between the laws of segregation and independent assortment
5. Describe the structure and functions of Aspartic amino acids
6. Briefly describe the structure and composition of polysaccharides

SECTION C: ESSAY QUESTIONS (45 minutes; 25 marks each)

1. (a) Describe the different types of genetic dominance (15 marks)
(b) With examples, discuss recessive lethal alleles in human beings (10 marks)
2. Discuss the process of glycolysis (25 marks)
3. Discuss the process of photosynthesis (25 Marks)