



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

THIRD YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (BIOLOGY)

BACHELOR OF EDUCATION (SCIENCE)

SBT 300: CELL BIOLOGY AND GENETICS

DATE: 18/8/2021

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

Answer Question One And Any Other Two Questions

SECTION A (COMPULSORY)

QUESTION ONE (30 MARKS)

- a) Explain the principles of the cell theory (3 marks)
- b) Describe the structure and function of centrosomes (3 marks)
- c) Describe the structure and functions of plastids in cells (3 marks)
- d) Describe the fluid mosaic structure of the cell membrane (3 marks)
- e) Describe amoeboid movement of cells (3 marks)
- f) Explain the Mendelian concept of inheritance (3 marks)
- g) Explain the meaning of the term 'gene expression' (3 marks)
- h) Define the role of DNA and RNA in inheritance (3 marks)
- i) Explain the meaning of cell specialisation and multicellularity (3 marks)
- j) Describe the main events of prophase I (3 marks)

SECTION B ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

- a) Describe mitosis (10 marks)
- b) Describe cell fractionation and disruption (10 marks)

QUESTION THREE (20 MARKS)

- a) Describe the structure, distribution and functions of endoplasmic reticula in cells. (10 marks)
- b) Discuss the the structure and functions of plasma membrane in cells. (10 marks)

QUESTION FOUR (20 MARKS)

- a) Discuss the mechanisms of movement of substances in and out of cells. (10 marks)
- b) Discuss translation in gene expression. (10 marks)

QUESTION FIVE (20 MARKS)

- a) Describe sex determination mechanisms in animals. (10 marks)
- b) Discuss sex linked traits in man. (10 marks)