

FEDERAL UNIVERSITY OF TECHNOLOGY OWERRI
DEPARTMENT OF BIOLOGICAL SCIENCES
RAIN SEMESTER EXAMINATION 2013/2014
BIO 312 (3 UNITS) CYTOGENETICS AND POPULATION GENETICS
TIME ALLOWED: 3Hrs DATE 29 - 09 -2014

Instructions: Answers question one (1) and any other four questions.

Section A

1. What is cytogenetics? (2 marks)
- b. What is chromosome? (2 marks)
- c. Outline the application of cytogenetics in plant production and medical or veterinary care. (8 marks)
- d. Explain the concept of "a population" in population genetics. (8 marks)

Section B

2. Differentiate between Aneuploidy and Polyploidy. (4 marks)
- b. Write short notes on any three of the following:
(i) Nucleus (ii) cell wall (iii) centromere (iv) Chromatid (v) Peroxisome.
(2 marks each)
3. State Hardy - Weinberg's equilibrium theory. (2 marks)
- b. Under what assumptions is this theory applicable? (3 marks)
- c. Mention the factors that affect gene frequencies in a natural (Mendelian) population. (5 marks)
4. Describe the composition, structure, and replication of DNA. (10 marks)
5. Differentiate between i. Homozygous and Heterozygous chromosomes
ii. Gene pool and Gene frequency iii. Recessive gene and Dominant gene
(10 marks)
6. Write short notes on the following:
i. vacuole ii. Plasma membrane iii. Endoplasmic reticulum (10 marks)
7. Write briefly on prophase 1 of meiosis (6 marks)
- b. differentiate between meiosis and mitosis (4 marks)