



## **NATIONAL OPEN UNIVERSITY OF NIGERIA**

**National Open University of Nigeria**  
**Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja**  
**Faculty of Science**

**JULY 2017 EXAMINATION**

**COURSE CODE: BIO 303**

**COURSE TITLE: GENERAL CYTOLOGY (2 UNITS)**

**TIME ALLOWED: 2 Hours**

**INSTRUCTION: ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER THREE QUESTIONS.**

1. a. Define the following terms:

- i. Cytogenetics; **(1mark)**
- ii. Cytology; **(1mark)** &
- iii. Genetics. **(1mark)**

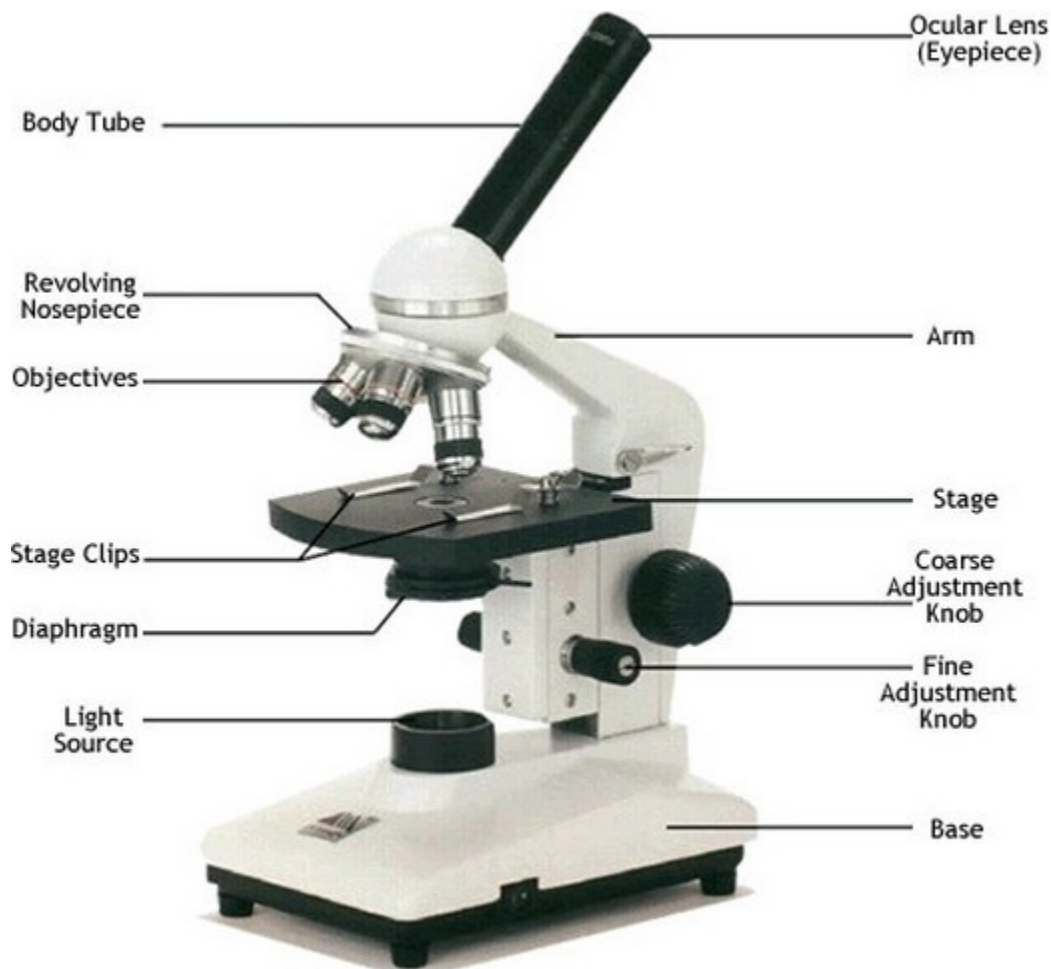
b. i. Mention the different types of Structural Chromosomal Variations.  
**(2marks)**

ii. Define each of the mentioned structural chromosomal variations.  
**(2marks)**

c. i. What is Numerical Chromosomal Variation? **(2marks)**

- ii. Mention the different types of numerical chromosomal variations.  
(1mark)

The diagram/image below shows the different parts of a modern day light microscope



- d. State the function(s) of each labeled part of the Microscope  
(6marks):
- e. State the feature & advantages of a Phase Contrast Microscope. (2marks)
- f. Indicate **two advantages** of an electron microscope. (2marks)
- g. Indicate **two major disadvantages** of an electron microscope. (2marks)
- h. Give any **three (3)** advantages of Fluorescence Microscope (3marks)

2. a. State the molecular composition of a cell. (**2 ½ marks**)  
b. State **five (5)** functions/importance of protein in a living cell. (**2½ marks**)  
c. List **five (5)** different types of Nucleic acids. (**2 ½ marks**)  
d. Outline the roles of the different types of nucleic acids. (**7 ½ marks**)
3. a. Mention **three (3)** major control checkpoints which exist during the course of eukaryotic cell cycle. Elaborate on **any one** of these checkpoints. (**5marks**)  
a. In a **tabular form**, make a brief comparison between RNA and Proteins. (**10marks**)
4. a. Outline the general cytogenetic procedures synonymous to all cytogenetic techniques. (**4marks**)  
b. i. Define Karyotype. (**2marks**)  
ii. After Karyotyping, what are the observable characteristics in the chromosomes? (**4marks**)  
c. Enumerate the importance and applications of cytogenetics. (**5marks**)
5. i. What is cellular differentiation? (**8marks**)  
ii. List the **four** main stages of embryogenesis. (**2marks**)  
iii. Write short note on the word “Gastrulation”. (**5marks**)