



NATIONAL OPEN UNIVERSITY OF NIGERIA

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

OCTOBER/NOVEMBER 2016 EXAMINATION

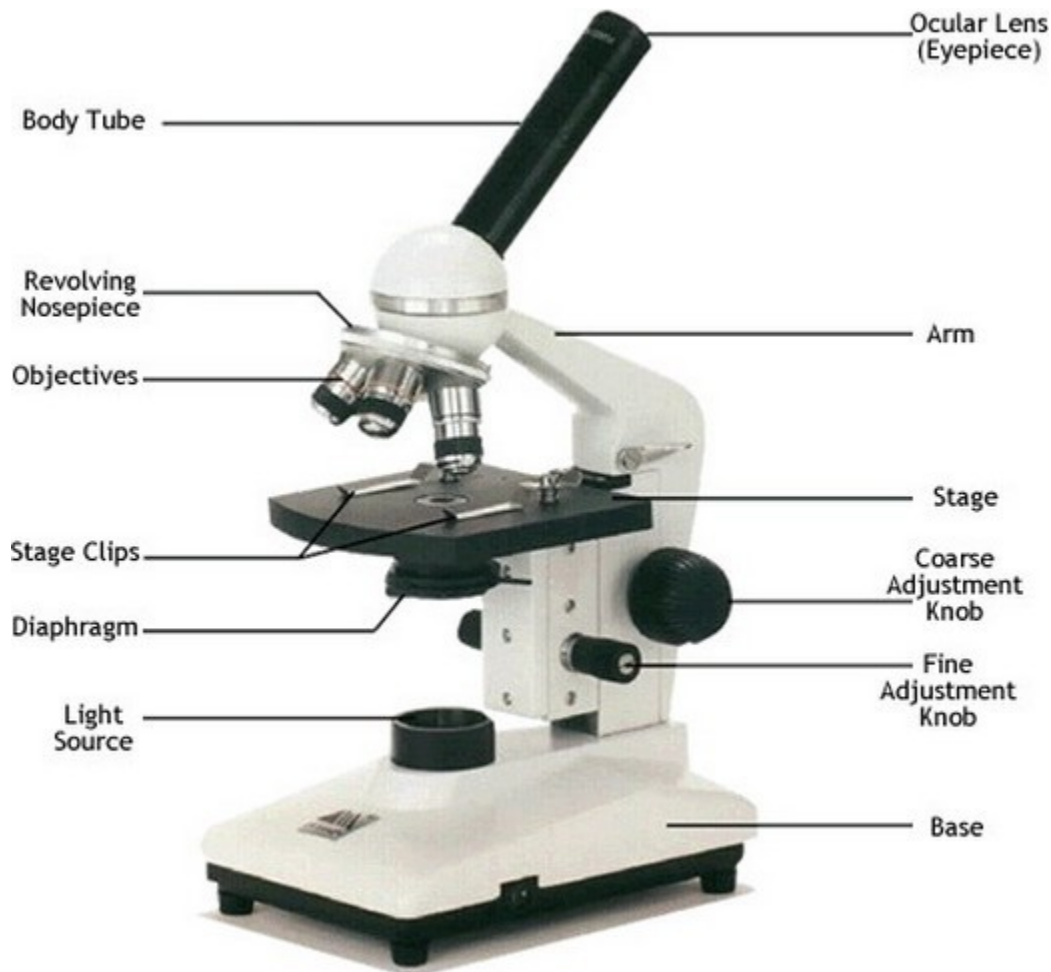
COURSE CODE: BIO 303

COURSE TITLE: GENERAL CYTOLOGY (2 UNITS)

TIME ALLOWED: 2 Hours

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

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



- a. State the function(s) of each labeled part of the Microscope **(12marks)**:
 - b. State the feature & advantages of a Phase Contrast Microscope. **(4marks)**
 - c. Define Darkfield Microscopy. State its advantages **(4marks)**
 - d. Indicate **two advantages** of an electron microscope. **(2marks)**
 - e. Indicate **two major disadvantages** of an electron microscope. **(2marks)**
 - f. 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. Define the following terms:

- i. Cytogenetics; **(2marks)**
- ii. Cytology; **(2marks)** &
- iii. Genetics. **(2marks)**

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.
(3marks)

4. a. Mention **three (3)** major control checkpoints which exist during the course of eukaryotic cell cycle. Elaborate on **any one** of these checkpoints.
(5marks)

b. In a **tabular form**, make a brief comparison between RNA and Proteins.
(10marks)

5. 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)**

6. i. What is cellular differentiation? **(8marks)**

ii. List the **four** main stages of embryogenesis. **(2marks)**

iii. Write short note on the word "Gastrulation". **(5marks)**

