



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCE
Biological Sciences
2025_1 EXAMINATION

BIO413: Developmental Biology

Time: 2 Hours

Credit Unit: 2

Instruction: Attempt THREE (3) questions only. QUESTION 1 is compulsory.

Q1.

- a. How does the zygote develop from the moment of fertilization to the process of cleavage? **(6 Marks)**
- b. Identify four key events that occur during the process of conception in living organisms **(6 Marks)**
- c. Provide a comprehensive explanation of the final stage in the maturation of sperm cells **(6 Marks)**
- d. Describe the process of germ cell determination in *Drosophila melanogaster* **(6 Marks)**
- e. Explain somitogenesis **(6 Marks)**

Q2

- a. Analyze the organized arrangement of differentiated cells into complex tissues and organs **(4 marks)**
- b. Discuss the factors contributing to the decline in a woman's fertility as she ages **(4 marks)**
- c. Explain the distinctive and noteworthy characteristics of spermatogenesis **(6 marks)**
- d. List and explain the differences between cleavage and mitosis **(6 marks)**

Q3.

- a. Illustrate the process of egg development using an annotated diagram. **(10 marks)**
- b. Provide a concise overview of the different types of eggs categorized by yolk content. **(10 marks)**

Q4a. Explain the last step of sperm cell maturation **(8 marks)**

- b.** Give an account of the leptotene and zygotene stages of meiosis **(12 marks)**

Q5.a. State the changes that occur on the Zona pellucida as a result of Egg cortical reaction **(9 Marks)**

Discuss fertilization in terms of functions and outline the four (4) common events that occur during fertilization **(11 Marks)**