



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja**  
**Faculty of Science**  
**DEPARTMENT OF BIOLOGICAL SCIENCES**  
**2024\_2 EXAMINATION**

**COURSE CODE: BIO 413**  
**COURSE TITLE: DEVELOPMENTAL BIOLOGY**  
**CREDIT UNIT: 2 UNITS**  
**TIME ALLOWED: 2 HOURS**

**INSTRUCTION: ANSWER QUESTION ONE AND ANY TWO OTHERS.**

- 1a. Define growth. How does it differ with development? (5 marks)
- b. By way of definition, explain the following terms:
  - i) Fertilization. (2 marks)
  - ii) Cleavage. (2 marks)
  - iii) Mitosis. (2 marks)
  - iv) Meiosis. (2 marks)
- c. Enumerate the three (3) approaches to the study of embryology, and explain any two. (13 marks)
- d. Give two common features between sperm and ovum. (4 marks)
  
- 2a. Compare and contrast between spermatogenesis and oogenesis. (12 marks)
- b. How many sperm and egg cells are produced after spermatogenesis and oogenesis? (2 marks)
- c. Mention the four (4) stages in Gametogenesis. (6 marks)
  
- 3a. What is gamete interaction? (2 marks)
- b. Discuss the structure and functions of placenta. (14 marks)
- c. What are the roles of XY chromosomes in gender determination? (4 marks)
  
- 4a. Describe the germ cell migration in amphibians. (9 marks)
- b. Explain the phenomenon of Germ cell migration in birds and reptiles. (6 marks)
- c. Name the five (5) basic steps through which sperm and egg interaction takes place. (5 marks)
  
- 5a. What is acrosomal reaction? (2 marks)
- b. Describe the sequence of events during acrosomal reaction in sea-urchin. (12 marks)
- c. Highlight the likely difference between acrosomal reaction in sea urchins and in mammals. (6 marks)