



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**  
**FACULTY OF SCIENCE**

**Department of Biological Sciences**  
**2023\_1 POP EXAMINATION**

**COURSE CODE: BIO413**

**COURSE TITLE: DEVELOPMENTAL BIOLOGY**

**CREDIT: 2 UNITS**

**TIME ALLOWED: 2 HOURS**

**INSTRUCTION: ANSWER NUMBER ONE (1) AND ANY OTHER TWO (2) QUESTIONS**

- Q1a. Explain the Bonner (1965) critique on cataloging animals based on their adult structure (6 mrks)
- b. Describe Aristotle findings in development of bird (6mrks)
  - c. Explain how germ cell migration in birds and reptiles differ with that of the amphibians and mammals? (10mrks)
  - d. Enumerate the function of a placenta (8mrks)
- Q2a. Discuss the initial contact between gametes (sperm and egg) (8mrks)
- b. Give an account of the contributions of the following scientist in Developmental Biology (i) Anton van Leeuwenhoek (ii) Lazzaro Spallanzani (iii) J. L. Prevost and J. B. Dumas (12 marks)
- Q3a. Explain why the germ cells migrating into the gonad are termed bipotential in species like salamanders, housefly and mouse (2 mrks)
- b. Describe the morphogenetic movements in gastrulation
  - c. Enumerate (i) five ways of preventing infertility in female (5 mrks)  
(ii) four ways of treating infertility in female (4 mrks)
- Q4a. Outline features of mammalian cleavage that distinguish it from other cleavages. (7 mrks)
- b. Describe the following Assisted Reproductive Technology (ART) (i) In vitro fertilization (IVF), (ii) Zygote intrafallopian transfer (ZIFT) or Tubal Embryo Transfer, (iii) Gamete intrafallopian transfer (GIFT) (iv) Intracytoplasmic sperm injection (ICSI). (13mrks)
- Q5a. Differentiated cells are not randomly distributed, rather, they are organised into intricate tissues and organs. Discuss (4 mrks)
- b. Account for “how aging decreases a woman's chances of having a baby”. (4mrks)
  - c. Explain the intriguing and unique feature of spermatogenesis (4mrks)
  - d. Enumerate ways by which cleavage differ from mitosis. (8mrks)