



NATIONAL OPEN UNIVERSITY OF NIGERIA
Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi - Abuja
Faculty of Science
DEPARTMENT OF BIOLOGICAL SCIENCES
2024 1 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. Outline four (4) events in the historical development of Developmental biology. (4 Marks)
 - b. Distinguish 'mathematical modeling' from 'teratology'; as approaches to the study of embryology. (6 marks)
 - c. Mention the five (5) major stages in embryogenesis. (10 marks)
 - d. Give five (5) differences between spermatozoan and an ovum in mammals. (5 marks)
 - e. The avian sperm and egg have equal haploid nuclear components. However, the egg has accumulated additional materials or factors during its period of maturation. Name any five (5) of them. (5 marks)
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- 2a. Explain the following structures in a mammalian egg: (8 marks)
 - i) Egg jelly ii) Cortical granules iii) The cortex iv) Vitelline envelope
 - ii) Mention and explain any two (2) ways by which sperm is attracted towards the egg in animals. (12 marks)
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- 3a. With relevant examples, describe species-specific recognition in sea urchins. (12 marks)
 - b. Explain the induction of the mammalian acrosomal reaction by ZP3. (8 marks)
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4. Write brief and concise notes on four (4) of the following: (20 marks)
 - i) Prevention of Polyspermy in mammalian gametes
 - ii) Rearrangement of cytoplasm in avian egg
 - iii) External fertilization in aquatic animals
 - iv) Cleavage in Amphibians
 - v) Archenteron invagination
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- 5a. Briefly describe Gastrulation in snails. (4 marks)
 - b. Explain organogenesis. In what ways does it differ from somitogenesis. (6 marks)
 - c. Explain any five (5) categories eggs based on their yolk content. (10 marks)