



FACULTY	AGRICULTURE, ENGINEERING AND NATURAL SCIENCES		
DEPARTMENT	ENVIRONMENTAL SCIENCE		
MODULE	DEVELOPMENTAL BIOLOGY		
MODULE CODE	MIC3872		
DATE	NOVEMBER/DECEMBER 2021		
DURATION	3 Hours	MARKS	120

REGULAR EXAMINATION

Examiners: Dr E.G. Kwembeya (University of Namibia) & Ms S. Kanyemba (University of Namibia)

Moderator: Prof. R. Mavenyengwa (University of Zimbabwe)

This question paper consists of 3 pages (including the front page)

Instructions

- 1. Carefully read all the instructions.**
- 2. There are two sections in this paper.**
- 3. Answer all questions in Section A and choose any two questions in Section B**
- 4. Graph paper**

UNIVERSITY OF NAMIBIA EXAMINATIONS

Section A

This section is worth 60 marks. Answer all questions.

QUESTION 1

- (a) Explain the important differences between plant and animal growth. (4)
- (b) Explain indeterminate growth and relate this to growth in meristems. (4)
- (c) Describe the significance of meristems. (4)

QUESTION 2

- (a) Briefly discuss the importance of receptors for signal perception. (4)
- (b) Explain the concept of second messengers and their two roles in a signal transduction pathway. (4)

QUESTION 3

- (a) Suggest the physiological advantage of the accumulation of auxin conjugates in some seeds. (5)
- (b) Explain the concept of parthenocarpy and how it is influenced by auxins and gibberellins in different plant families. (5)

QUESTION 4

Due to global climate change and pollution, a lake experiences changes in temperature and pH. The lake has many species, including sexually reproducing frogs, water fleas that multiply by parthenogenesis, hydra that multiply by budding, and sponges that multiply by fragmentation. Which of these species will most likely survive the changing conditions of the lake and why? Also explain why the other groups are less likely to survive. (12)

QUESTION 5

Explain the differences between the two means of gametogenesis. (8)

QUESTION 6

With the focus on sea urchins and mammals, discuss the concept of sperm capacitation. (10)

Section B: Essays Section

This section is worth 60 marks; Answer any two questions in this section.

QUESTION 1

Discuss the various environmental factors that control plant development. In your essay emphasise also the interdependency between environmental, genetic, hormonal control mechanisms.

(30 marks)

QUESTION 2

Discuss the hormonal changes that occur during seed development, maturation, and germination with emphasis on the action of hormones in the mobilization of food reserves in the seed.

(30 marks)

QUESTION 3

Discuss how the process of gametogenesis can contribute to the maintenance of genetic diversity and integrity during the development of sexually reproducing animals. (30 marks)

-----**END OF EXAMINATION**-----