

UNIVERSITY OF SWAZILAND
DEPARTMENT OF BIOLOGICAL SCIENCES
FINAL EXAMINATION PAPER DECEMBER 2017

TITLE OF PAPER: ECOLOGY

COURSE CODE: B304/BIO311

TIME ALLOWED: THREE HOURS

INSTRUCTIONS:

1. ANSWER ALL QUESTIONS
2. ILLUSTRATE YOUR ANSWERS WITH LARGE AND CLEARLY LABELLED DIAGRAMS WHERE APPROPRIATE

SPECIAL REQUIREMENTS: NONE

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATORS

Question 1

Select and answer any question below:

- (a) Explain the definition of "*invasive alien species*" by illustrating at least three (3) common characteristics of IAPs. Indicate any three options for IAPs control. (10 marks)
- (b) State any five (5) pathways of IAP and any five (5) categories of impacts of IAPs. (10 marks)
- [Total marks = 10]**

Question 2

- (a) Explain what an ecosystem is, indicating its usefulness in biological sciences. Elaborate on the difficulties in defining the precise boundaries of an ecosystem. (15 marks)
- (b) Explain vegetation succession and why it occurs, including 'climax' and 'plagioclimax' vegetation communities. (5 marks)
- (c) Suggest two reasons why vegetation communities may not always display the characteristics of the ecological climax. (5 marks)
- (c) Briefly discuss the two contrasting arguments (for and against) the idea that vegetation succession is a useful concept in biological sciences. (5 marks)
- [Total marks = 30]**

Question 3

- (a) Draw an annotated diagram illustrating the main features of the hydrological cycle. (6 marks)
- (b) State and explain the main reasons why the run-off of agricultural fertilisers into watercourses is a difficult environmental problem to manage. (9 marks)
- (c) Explain what 'soil erosion' is. Discuss the main factors that increase rates of soil erosion. Furthermore, explain how soil erosion from agricultural land can be minimized. (15 marks)
- [Total marks = 30]**

Question 4

Discuss the impacts of human activity on the carbon cycle and explain possible mitigation strategies. Your answer should include the description of the characteristics of the carbon cycle as a biogeochemical cycle and how specific anthropogenic activities can have specific impacts thereon. (30 marks)

[Total marks = 30]

END OF EXAMINATION PAPER