UNIVERSITY OF FORT HARE

Insect biology, diversity and ecology

ZOO 223

SUPPLEMENTARY EXAMINATIONS

JANUARY

2019

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Time:	**3 hour**
Subject:	**ZOO 223**
Marks:	**100**

This paper consists of 3 pages including the cover page

Internal Examiners

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INSTRUCTIONS

Answer all questions.

Question 1 [15 Marks]

1.1. Explain how the concept of selective modes of reproduction and feeding results into drones, workers and queens in honeybees. [4]

1.2. List 5 duties of young workers of Vespid wasps. [5]

1.2. Explain any 3 morphological variations that can be seen in soil insects including collembola. [3]

1.3.List 3 factors that determine the nature and timing of insect succession on a corpse [3]

Question 2 [20 Marks]

2.1.Define any two of the following terms: (i) classical biological control (ii) sequestration (iii) adaptive radiation. [4]

2.2.List three (3) types of insect-plant interactions and explain the possible effects of plant defenses on the performance of phytophagous insects. [6]

2.3.Phytophagous insects are known to utilize several feeding strategies to obtain nutrients from their host plants. Briefly discuss any three (3) of these strategies, and for each strategy provide <u>one</u> example of an insect (or insect order) that utilizes the strategy. [10]

Question 3 [15 marks]

3.1.Discuss how various vectors contribute to moving Yellow Fever from a sylvatic to an urban cycle. [6]

3.2.Discuss the control methods for tsetse fly. [9]

Question 4 [25 marks]

4.1. Compare and contrast quiescence and diapause in insect life cycle. [5]

4.2. Elaborate on why insects are often referred to as ecosystem engineers. [10]

4.3.Our blue planet would suffer unimaginable calamity without the crawling and flying insects that we so much despise. Life as we know will virtually cease to exist in face of ecosystem dysfunction, ecological imbalances and mass extinctions of all life forms due to starvation." Carefully analyse this statement and write a short essay that justify its validity. [10]

Question 5 [25 marks]

4.1. Suppose that, thirty (N = 30) preliminary samples of the Colorado potato beetle indicates that the average density of the beetles per plant (M) is 0.5 and the standard deviation (SD) is 0.9. To be certain that your results are 90% accurate [A = 0.1 (10%)]. How many more additional samples would have to be collected? [5]

4.2.Examine the table below and use the data to calculate the intrinsic rate (r) at which the species population grows. [20]

x	Lx	Mx
Age	Survival	Reproduction
0	1	0
1	0.845	0.045
2	0.824	0.391
3	0.795	0.472
4	0.755	0.484
5	0.699	0.546
6	0.626	0.543
7	0.532	0.502
8	0.418	0.468
9	0.289	0.459
10	0.162	0.433
11	0.06	0.421