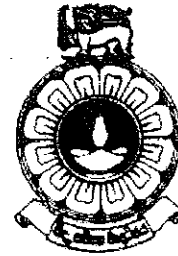


The Open University of Sri Lanka
Faculty of Natural Sciences
B.Sc Degree Programme



Department	: Zoology
Level	: Five (5)
Name of the Examination	: Final Examination
Course Title and - Code	: Entomology, ZYU5306
Academic Year	: Academic year 2020/ 2021
Date	: 21 st December, 2021
Time	: 9.30 a.m. to 11.30 a.m.
Duration	: 2 hours

General Instructions

1. Read all instructions carefully before answering the questions.
 2. This question paper consists of Six (6) questions in 3 pages.
 3. Answer any **Four (4)** questions only. All questions carry equal marks.
 4. Answer for each question should commence from a new page.
 5. Draw fully labelled diagrams where necessary
 6. Involvement in any activity that is considered as an exam offense will lead to punishment
 7. Use blue or black ink to answer the questions.
 8. Clearly state your index number in your answer script
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1. Explain the generalized structure and composition of the insect integument highlighting its functions. (100 marks)

2. *Rhodnius* bug and Desert Locust are two insects that adversely affect human health and agricultural crop production.
 - 2.1 Compare and contrast between *Rhodnius* bug and Desert Locust with respect to the following;
 - a) General organization of their alimentary canals.
 - b) Excretory products and formation of excretory products. (70 marks)
 - 2.2 Explain the features in the modes of life of *Rhodnius* bug and Desert Locust that affect human health and agricultural crop production respectively. (30 marks)

3. 3.1 Explain the influence of photoperiod on insect behaviour. (60 marks)

- 3.2 Adult Diamondback moths were allowed to mate and lay eggs on cabbage plants grown in a greenhouse maintained at a constant temperature of 25⁰ C. An entomologist recorded it's post embryonic development from egg to the adult stage in terms of physiological time in the table given below. The Diamondback moth's development threshold was 20⁰C.

Appearance of life cycle stages from the date of egg laying	Physiological time of development
First instar larvae	20
Second instar larvae	30
Third instar larvae	40
Fourth instar larvae	50
Pupa within silken cocoon	65
Adult on sticky traps within green house	75

Using the above information provide answers to questions (a) to (e).

- a) How many degree days will accumulate each 24 hours when the insect is reared in the green house?
- b) Calculate the time taken in days for embryonic development and development of pupa?
- c) Calculate the number of days taken for the life cycle to complete from the egg stage to adult stage?

- d) If a hymenopteran species is released to control Diamondback moth larvae feeding on cabbage leaves, what will be the most effective time to implement the method?
- e) Describe the impact of hymenopteran adults on Diamondback moth larvae. (40 marks)
4. 4.1 Describe the perception of visual signals by compound eyes of nocturnal insects. (40 marks)
- 4.2 List six (6) differences between visual communication and chemical communication. (30 marks)
- 4.3 Name two (2) examples of synomones and explain the interactions they mediate between organisms. (30 marks)
5. Write an essay on insect defense strategies. (100 marks)
6. Write short notes on any three (3) of the following
- a) Insect eggs
 - b) *Aedes aegypti*
 - c) Insect antenna types
 - d) Trachea and tracheoles
- (100 marks)
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