

THE OPEN UNIVERSITY OF SRI LANKA
B.Sc DEGREE PROGRAMME – LEVEL 5 – 2011/2012

COURSE TITLE – INSECT BIOLOGY
COURSE CODE – ZLU 3186/ ZLE 5186

OPEN BOOK TEST – II
DURATION: ONE HOUR (01)



Registration No:.....

Date: 29th April 2012

Time: 11.00 am – 12. 00noon

ANSWER ALL QUESTIONS IN PARTS A & B.

- Part A consists of three Sections with thirty five blanks and the blanks should be filled with suitable words.
- Part B is a structured essay question consisting of eight parts from 2.1 – 2.08. Answers should be written in the space provided.

At the end of the examination the whole paper should be handed over to the examiners.

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Part A

1.0. Fill in the blanks in the articles given below with the most appropriate word/s.

1. What are Social insects!

The phrase Social Insects commonly brings to our mind the honey bee or ants, but Sociality in one form or the other can be seen in many other insects as well. Growing Interest in the study of social insects has made it necessary to have precisely defined technical terms for different levels of sociality. Eusocial, meaning (1) social. They represent the most highly evolved level of sociality. Here, Individuals of the (2) species cooperate in caring for the (3), There is reproductive division of (4), with more or less sterile individuals working on behalf of fecund individuals and there is an overlap of at least two (5) of the stages capable of contributing to colony labor, so that offspring assist (6) during some period of their (7), Thus, three important characters namely, Cooperative brood care, Reproductive caste differentiation and Overlap between generations are essential for a species to be called (8), Ants, bees and wasps (Order: (9)) and termites (Order: (10)) are typical examples of eusociality. Recent evidence suggests that some aphids may also be (11)

There is not a single example of eusociality outside the class (12) -not even in birds and mammals which are generally considered as spectacular examples of social (13) Among insects

and other arthropods, there are several other levels of sociality which fall short of eusociality.

All (14) most ants and many bees and wasps such as the honey bees and the vespine wasps, respectively, are highly social. Without exception the highly eusocial state is restricted to the orders (15) and (16) in the entire (17)kingdom.

2. Flowering plant: Insect-Pollinator Relationship

Many (18) plants are entomophilous. Plants (19) insect pollinators by producing flowers with (20) The insect benefits by obtaining nectar as food while visiting the (21)and plant benefits from the insect visit by obtaining pollen from another plant facilitating cross (22) The insect visit to the flower may be a function of amount of nectar present in flower, color of the flower and morphometry of the (23) The (24)collects pollen on its body while visiting the flower rubs this pollen on stigma of another (25)when it visits and if the flowers belong to the same species cross fertilization can occur. This relationship is complex and has co-evolved.

From energies and cost benefit point of view, the plant would ensure pollination at the minimum cost producing as little pollen and nectar as possible. On the other hand the insect (26) would maximize the visit to the flower by collecting more nectar per unit time and per visit. Thus theoretically different flowers compete themselves in inviting (27)pollinators. Another situation may be by producing flowers at different times of the (28), plants can avoid such type of competition. In other situation different flowers because of the quality of the (29) they produce and color of (30) may attract different insects, particularly Lepidoptera and Hymenoptera. These options have been observed in tropical and sub-tropical forest ecosystems.

Another interesting phenomenon is the pollination in Chinese gooseberries (*Actinida chinensis*) or tomato flower. Which require special type pollination called buzz pollination. An insect visiting the flower buzzes loudly (produces sound) and the vibration of the buzz shakes the dry pollen out of the male flower and the pollen falls on the body of the insects or bee. Since honeybees cannot buzz sound, they cannot be utilized to pollinate gooseberries or tomato plants. The large Bumble bee species (*Bombus* sp.) which produces buzz sound are ideal for bringing pollination in the species.

Specialized (31) might also occur depending upon the specialization of the plant and the (32) that visits it. This information has important bearing on crop productivity and introduction of new crops in new places.

3. General sentences on insects:

3.1. In (33)insects, the mouthparts are projected forward along the horizontal axis of the body.

3.2. The terminal part of the foregut is known as the (34).....

3.3. The new insect order discovered recently has been named as (35).....

[35 Marks]

Part B

Registration No:

2.0. Answers should be written in the space provided.

2.1. Explain the following terms.

1. Co - evolution:

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2. Entomophagous insects:

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3. Sclerotization:

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4. Insect Petiole:

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5. Waggle dance:

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4. Chitin

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2.2. List characteristic features of the Apterygote insects.

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2.3. Name five insect orders which contain the phytophagous insects. Give example/s in each case.

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2.4. List the major types of insect injuries caused to plants.

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2.5. Name **one** insect order where both the beneficial and harmful species to human being can be identified. Giving examples, list the harmful and beneficial effect of each

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Harmful nature	Beneficial nature

