Name: _____Student number: _____

BIO 3333 - Entomology
Final examination
Worth 40% of your final grade

Tuesday April 16, 2007

Place your name and student number in the space provided below.

Check to be sure that your exam is complete with a total of 11 pages including this one

Answer all questions in the space provided on the exam. Do not transfer answers to the back of the page

The exam is out of 135 pts.

This is not an open book exam

Name: _____

Student No: _____

Name: _____Student number: _____

45 pts **Part 1**. Briefly, using one or two sentences, describe what each of the following biological terms means. Use an example where possible.

Hyperdiverse

Pterothorax

Polysubstrate monooxygenase

Haplodiploid sex determination

Hyperparasitoids

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Arrhenotokus parthenogenesis

Apneustic

Permethrin

Proleg

Bee space

Name: _____Student number: _____

Apterygota

Tritocerebrum

Siphonaptera

Secondary metabolites

Resistance

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10 pts. Part 2 The following question is compulsory

Who are the Paraneopteran insect orders and how are they grouped and distinguished from each other (HINT: This would be a good place to use a cladogram)

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30 pts. Part 3: There are 10 questions in the following section. You only have to do 6 of them so be sure to read through them carefully before you start answering them. Each is worth 5 points. **Do not answer both parts of the same question!**

3.1 What are the main components of a mechanoreceptive trichoid sensillum.
Or
What is a rhabdome and how is its structural organization related to how it function

3.2 Insects have an immune system, briefly describe its components.
Or
Briefly describe the organization of the tracheal system in insects.

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3.3 Describe the life cycle of an aphid or a the fig wasps

3.4 Why do entomologists believe there are so many Coleoptera?

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3.5 The Lepidoptera and Trichoptera are grouped in a single taxon. What is the name of the taxon and what characters do these two insect orders have in common?
Or
The grouping of the Diptera and Strepsiptera are grouped in a single taxon is controversial. When they are grouped what is the name of the taxon and what characters do these two insect orders have in common?

3.6 The crop in an insect is always involved in storage but anatomically it isn't the same in different insects groups. What are the anatomical differences how is this related to the food the insect feeds on.
Or
What is primary urine and how is it produced?

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3.7 What is the entomological basis to the children's rhyme "Ring around the rosie, a pocket full of posies, Husha, husha We all fall down."?
Or
Identify the causative agent, vector and transmission mechanism for one of the following three diseases of medical importance: Trypanosomiasis, Ocncoceriasis or Murine typhus.

3.8 What is economic injury level and how is it used in modern agricultural practices
Or
There are a number of types of Biological control that can be used to control insect pests. Define Biological control and briefly describe the different categories, or types of biological control.

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3.9 One of the direct effects that insects have on animals includes venoms and allergins. What are they and their effects?
Or
What are the characteristics that define eusocial insects?

3. 10 How do insect parasitoids differ from typical parasites? What is a parasitoid and how does it manage to do what it does.
OR
Ectoparasites can be categorized into different types. First what is an ectoparasite? What are the different types and give an example of each?

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20 pts Part 4: Fill in the missing word, or provide the one word answer in the space provided at the end of the sentence. If the line is missing, add it.

4.1 These swell if you have bubonic plague. _____

4.2 A plants reward to the insect pollinator that is just for the insect. _____

4.3 To the nearest 10% the protein content of insects. _____

4.4 Some insects invade the stems of plants and take control. The structure that forms is called a _____.

4.5 If the silkworm releases this enzyme the silk strand is chopped into thousands and thousands of strands._____

4.6 An phytophagous insect life-line for dealing with slippery plant surfaces.

_____

4.7 These mosquitoes carry malaria. _____

4.8 This reproductive strategy allows aphid populations to explode in the spring and early summer. _____

4.9 To the nearest 10% the sugar content of honey. _____

4.10 Usually filamentous appendages attached to the abdominal tip of apterous insects.

_____

4.11This compound in maggot therapy promotes wound healing. _____

4.12 The feeding strategy of ectoparasites is that of very specialized _____ .

4.13 An example of an inorganic pesticide. _____

4.14 The technical term for eating insects. _____

4.15 The gender of the first fig wasp eggs to hatch inside the fig. _____

4.16 The term used to describe the insect carrier of a disease._____

4.17 Acacias provide their ants with protein using the _____ bodies.

4.18 These ancient plant parts may have been one of the first plant foods that insects fed on. _____

4.19 Living between the layers of a plant's leaf is referred to as _____ .

4.20 Lice are examples of this type of crawling ectoparasite. _____

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15 pts Essay Question 5 – Answer in the first booklet provided

From the very start of the course we have described insects as being a very success full group and gave criteria for measuring this success. There is a biological basis for that success which included: Body size, flight, the exoskeleton, metamorphosis, reproductive potential and their co-evolution with plants. Discuss the biological functions that underlie these reasons for insect success for any three (excluding body size) and the criteria that are used to measure success in the first place?

15 pts Essay Question 6 – Answer in the second booklet provided

Holometabolous metamorphosis was an important event in the evolution of insects. How do entomologists believe it first arose and what are the presumed benefits of this new life cycle strategy?

OR

Plants weren't an easy food source for insects to adapt to and conquer, why and what is the evidence for this statement?