



**FACULTY OF NATURAL RESOURCES MANAGEMENT AND  
AGRICULTURE**

**DEPARTMENT OF CROP SCIENCE**

**PROGRAMME: BSc HORTICULTURE AND CROP PRODUCTION**

**NHC 1201 INTRODUCTION TO ENTOMOLOGY AND PARASITOLOGY**

**FINAL EXAMINATION**

**MARCH-MAY 2024**

**This examination paper consists of 3 pages,**

**Time Allowed: Three (3) Hours**

**Total Marks: 100**

**Special Requirements: pen, pencil, ruler.**

**Examiner's Name: Dr A Banda**

**Instructions**

1. Answer **ALL** questions in Section A
2. Answer any **TWO (2)** questions in Section B

**Mark allocation**

<b>Question</b>	<b>Marks</b>
Section A	60
Section B	40
Total attainable marks	100

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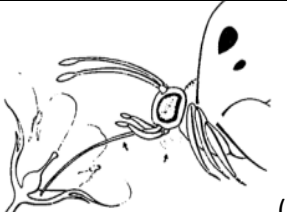
**SECTION A: Answer ALL questions.**

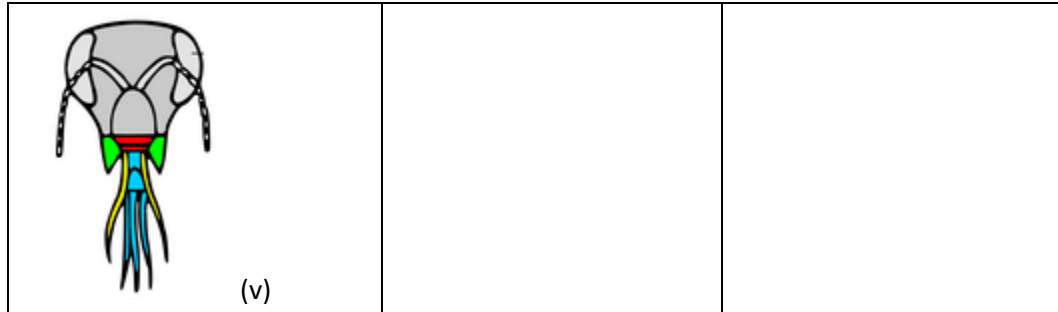
**Question 1**

- a. Give general names of insects which undergo the following life cycles
- (i) none [2 marks]
  - (ii) incomplete [2 marks]
  - (iii) complete [2 marks]
- b. Describe the life cycle of a holometabolous insect. [6 marks]
- c. Identify two (2) major features of the life cycle and/or anatomy that distinguish this insect as a holometabolous insect different from a hemimetabolous insect [8 marks]

**Question 2**

- a. State the feeding type and one insect example aligned to each mouth part(s)

Mouth part(s)	Feeding type	Insect example
(i) 		
(ii) 		
(iii) 		
(iv) 		



[10 marks]

- b. You've spotted some chewing damage on leaves of tomato plants.
- (i) Name 3 orders of insects (either adult or larva/nymph,) that cause this type of damage [3 marks]
- (ii) Then having found the culprit, what diagnostic features would distinguish the stage of each order that you named from those of the other orders [5 marks]
- c. A friend of yours has just come to you with an insect that he thinks might be a bed bug (i) what would you look for first time to determine if it is true bug? [1mark]
- (ii) Name the order to which it belongs [1marks]

### Question 3

- a. Write the correct letter

<p><b>1</b></p> <p>Beetles are in the Insect Order:</p> <p><b>A</b> Coleoptera  <b>B</b> Diptera  <b>C</b> Lepidoptera  <b>D</b> Hymenoptera  <b>E</b> Orthoptera  <b>F</b> Odonta</p>	<p><b>5</b></p> <p>Bees, wasps and ants are the Insect Order:</p> <p><b>A</b> Coleoptera  <b>B</b> Diptera  <b>C</b> Lepidoptera  <b>D</b> Hymenoptera  <b>E</b> Orthoptera  <b>F</b> Odonta</p>
<p><b>2</b></p> <p>Grasshoppers and crickets are in the Insect Order:</p> <p><b>A</b> Coleoptera  <b>B</b> Diptera  <b>C</b> Lepidoptera  <b>D</b> Hymenoptera  <b>E</b> Orthoptera  <b>F</b> Odonta</p>	<p><b>6</b></p> <p>Dragonflies and damselflies are in the Insect Order:</p> <p><b>A</b> Coleoptera  <b>B</b> Diptera  <b>C</b> Lepidoptera  <b>D</b> Hymenoptera  <b>E</b> Orthoptera  <b>F</b> Odonta</p>

<p><b>3</b> Butterflies and moths are in the Insect Order:</p> <p><b>A</b> Coleoptera  <b>B</b> Diptera  <b>C</b> Lepidoptera  <b>D</b> Hymenoptera  <b>E</b> Orthoptera  <b>F</b> Odonta</p>		<p><b>7</b> The Insect Order with back legs made for jumping is:</p> <p><b>A</b> Coleoptera  <b>B</b> Diptera  <b>C</b> Lepidoptera  <b>D</b> Hymenoptera  <b>E</b> Orthoptera  <b>F</b> Odonta</p>
<p><b>4</b> Flies and mosquitoes are in the Insect Order:</p> <p><b>A</b> Coleoptera  <b>B</b> Diptera  <b>C</b> Lepidoptera  <b>D</b> Hymenoptera  <b>E</b> Orthoptera  <b>F</b> Odonta</p>		<p><b>8</b> The Insect Order that is well known for forming hives and colonies is:</p> <p><b>A</b> Coleoptera  <b>B</b> Diptera  <b>C</b> Lepidoptera  <b>D</b> Hymenoptera  <b>E</b> Orthoptera  <b>F</b> Odonta</p>

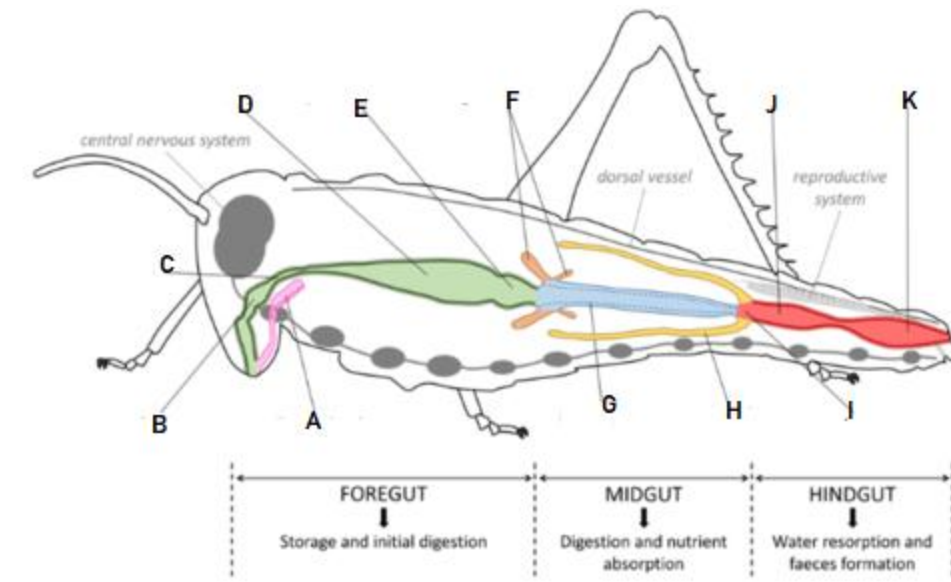
8 marks

- b. Name the morphological features that distinguish(es) all dipteran species from members of other orders **[5marks]**
- c. What is the principal feeding technique of most adult dipteran species **[5 marks]**
- d. State the peculiar feature of the metamorphosis from the larval to the adult stage of the cyclorrhaphan flies (house flies, blow flies, etc), that is different from the metamorphosis of their endopterygota **[2 marks]**

**SECTION B: Answer any TWO questions.**

**Question 4**

- a. Label the insect digestion parts (A-K) in the following diagram.



**11 marks**

- b. A female mosquito has to imbibe blood very quickly or it is likely to get smashed. Where does it store this meal prior to digestion? **[1 mark]**
- c. Blood contains a lot of protein and therefore an excess of nitrogen. In what form will this nitrogen be excreted and by which organs? **[6 marks]**
- d. Insects that feed on dry food acquire a membrane around the food as it passes through the gut. What is this membrane and where is it produced? **[2 marks]**

### Question 5

- a. Define
- (i) Incidental (accidental) parasite **[2 marks]**
  - (ii) Amoebiasis **[2 marks]**
  - (iii) Parasitism **[2 marks]**
  - (iv) Intermediate host **[2 marks]**
  - (v) Encystation **[2 marks]**
- b. Briefly elaborate on the common Liver fluke (*Fasciola hepatica*) **[10 marks]**

### Question 6

- a. You have been appointed the Veterinary Regional Officer of Zimbabwe. Currently their cattle are suffering from January disease (Theileriosis). Thus, you have been assigned to control the disease in the region. Briefly describe its:

- (i) Cause(s) [2 marks]
- (ii) Signs and symptoms [5 marks]
- (iii) Management [6 marks]
- (iv) Treatment [3 marks]

of the disease

- b. Tritrichomonas foetus bovine and Neospora caninum are protozoans that cause abortions in cattle. Match the left occurrence to the correct parasite on the right.

(i)Early abortions	A Tritrichomonas foetus bovine
(ii)Apicomplexan	B Neospora caninum
(iii)Sexual transmission	C Both
(iv)Ingest tissue cysts from cow placenta	

[4 marks]

**END OF QUESTION PAPER!!!**