

THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874

Registered Charity No. 212025

EXAMINATION FOR PROFICIENCY IN APICULTURE

MODULE 5 HONEYBEE BIOLOGY

Candidate Number:

8th November 2014 Time Allowed 1½ hours

Instructions to Candidates

Read the questions carefully. Answer All Sections. It is recommended not to spend more than 10 minutes on Section A, 50 minutes on Section B or 30 minutes on Section C.

Unless stated otherwise questions apply to Honeybees.

Use **BLACK** pen for text. **Black** pencil may only be used for diagrams. **DO NOT USE COLOURS.**

Examiner Use Only

Question	Sec A	B11	B12	B13	B14	B15	C16	C17	Total
Mark									
Moderated									

SECTION A (10 marks, 1 for each question)

Answer **ALL** the questions in this section. Use one or two word or short phrase answers. Please write your answers on the question paper.

- Q1 Name an enzyme added to nectar by the honeybee.
- Q2 Name the 5 pairs of openings in the heart of the honeybee.
- Q3 Name a structure which arises from the endoderm layer of germ cells in the embryo.
- Q4 What is the function of the spinneret?
- Q5 What is the colour of the brood food component produced by the hypopharyngeal gland?
- Q6 Name the two pheromones that suppress the development of workers ovaries?
- Q7 Where is the oblong plate found in the honeybee?
- Q8 From which segment of the larva is the proctiger formed?
- Q9 How many ovarioles are there in each of the queen's ovaries?
- Q10 What does the term plumose mean?

PLEASE HAND IN THIS SHEET AT THE END OF THE EXAMINATION

MODULE 5 HONEYBEE BIOLOGY

8th November 2014

SECTION B (60 marks, 15 for each question)

Answer any **FOUR** questions from this section. Write short notes for your answers.

Marks

- Q11 (a) What is the function of a drone? 1
(b) Excluding glands, list 7 external differences between a drone and a worker. 8
(c) Label the diagram provided. 5
(d) How old is the drone in this diagram? 1
- Q12 (a) How many Malpighian tubules are in:
(i) a larval honeybee? 2
(ii) an adult honeybee? 2
(b) Which waste products do the Malpighian tubules excrete and where are these waste products produced? 11
(c) With reference to the Malpighian tubules, briefly describe the excretory process in the larval and adult honeybee.
- Q13 (a) List the functions of the fat bodies during the following stages:
(i) the larval; 4
(ii) the pupal;
(iii) the adult bee.
(b) List the types of cell found in a fat body. At what developmental stage are they found? 6
(c) How does the composition of the fat bodies differ during the year? What causes these changes? 5
- Q14 List the functions of the mandibular glands in the worker, the queen and the drone. 15
- Q15 (a) Define the term hormone. 1
(b) Name the structures that make up the endocrine system in the larva. 4
(c) List the effects of hormones in the larval and adult honeybee. 10

SECTION C (30 marks)

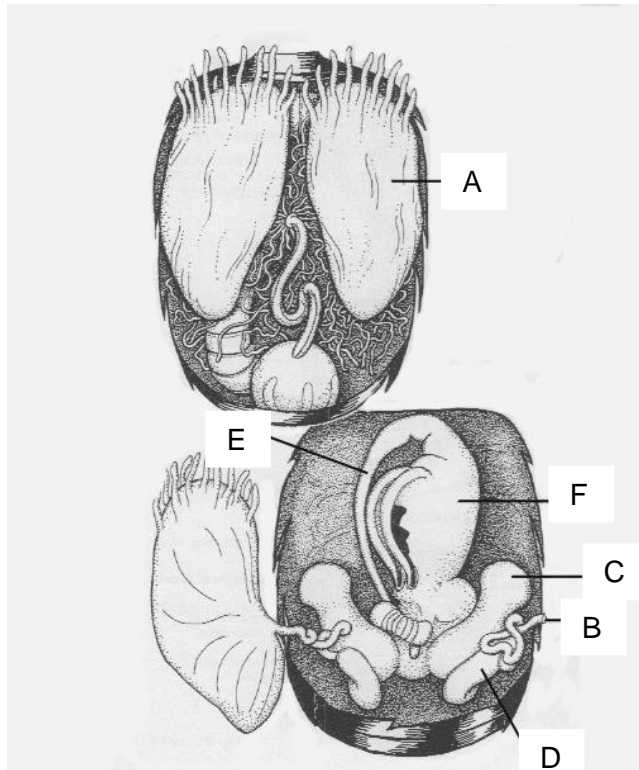
Answer **ONE** question from this section. Give *labelled* diagrams where applicable.

- 16 (a) Draw a simple labelled diagram of the antennae of a drone. 3
(b) Describe the formation, structure and function of the antennae including caste differences. 27
- 17 (a) Define respiration. 2
(b) Describe the respiratory system of the adult honeybee. 14
(c) Discuss the exchange of respiratory gases: both at rest and during active flight. 14

MODULE 5 HONEYBEE BIOLOGY
8th November 2014

Q11 (c) Label the diagram below.

5



A: _____

B: _____

C: _____

D: _____

E: _____

F: _____

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