

THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874

Registered Charity No. 212025

EXAMINATION FOR PROFICIENCY IN APICULTURE

MODULE 5 HONEYBEE BIOLOGY

Candidate Number:

22nd March 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 the structure where the quadrate plate may be found.
- Q2 How many pairs of ganglia are found in the abdomen of an adult bee?
- Q3 Name a gland that is larger in winter honeybees than in foraging summer honeybees.
- Q4 Name the tanned protein that is important in the cuticle.
- Q5 Define Ecdysis.
- Q6 What is the outermost layer of the honeybee egg called?
- Q7 Where are the wax glands situated?
- Q8 What term is given to the large, main flight muscles in the honeybee?
- Q9 Where is Juvenile Hormone produced?
- Q10 At what stage in a drone's life cycle are the testes at their largest?

PLEASE HAND IN THIS SHEET AT THE END OF THE EXAMINATION

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SECTION B (60 marks, 15 for each question)

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

Marks

- | | | | |
|-----|-----|--|----|
| Q11 | (a) | Outline excretion of nitrogenous waste in the adult honeybee. | 10 |
| | (b) | Explain how this excretory system differs in the unsealed honey bee larvae. | 3 |
| | (c) | How else does a honeybee larva deal with nitrogenous metabolites? | 2 |
| Q12 | (a) | When at rest, describe briefly how the adult honeybee gets oxygen from the surrounding air to its bodily tissues. | 12 |
| | (b) | How and why this is different when the bee is flying? | 3 |
| Q13 | (a) | List the main structures of the circulatory system and give their functions. | 10 |
| | (b) | List five of the functions of haemolymph. | 5 |
| Q14 | (a) | Label the diagram provided. | 5 |
| | (b) | Outline the differences between the reproductive systems of the queen, normal worker honeybee and a laying worker. | 6 |
| | (c) | List the situations which might cause laying workers to develop. | 4 |
| Q15 | (a) | Label the diagram provided. | 4 |
| | (b) | List five other types of sensilla found on the honeybee. | 5 |
| | (c) | List the different functions of hairs (setae) in the honeybee, giving examples where appropriate. | 6 |

SECTION C (30 marks)

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

- | | | |
|-----|--|----|
| Q16 | Discuss honeybee nutrition with references to the principal nutrient groups, their sources, digestion, absorption and biological use to the adult honeybee. | 30 |
| Q17 | Discuss the visual system of the honeybee with reference to the structures involved in vision and how it varies between different sexes and castes. (Include labelled diagrams if desired) | 30 |

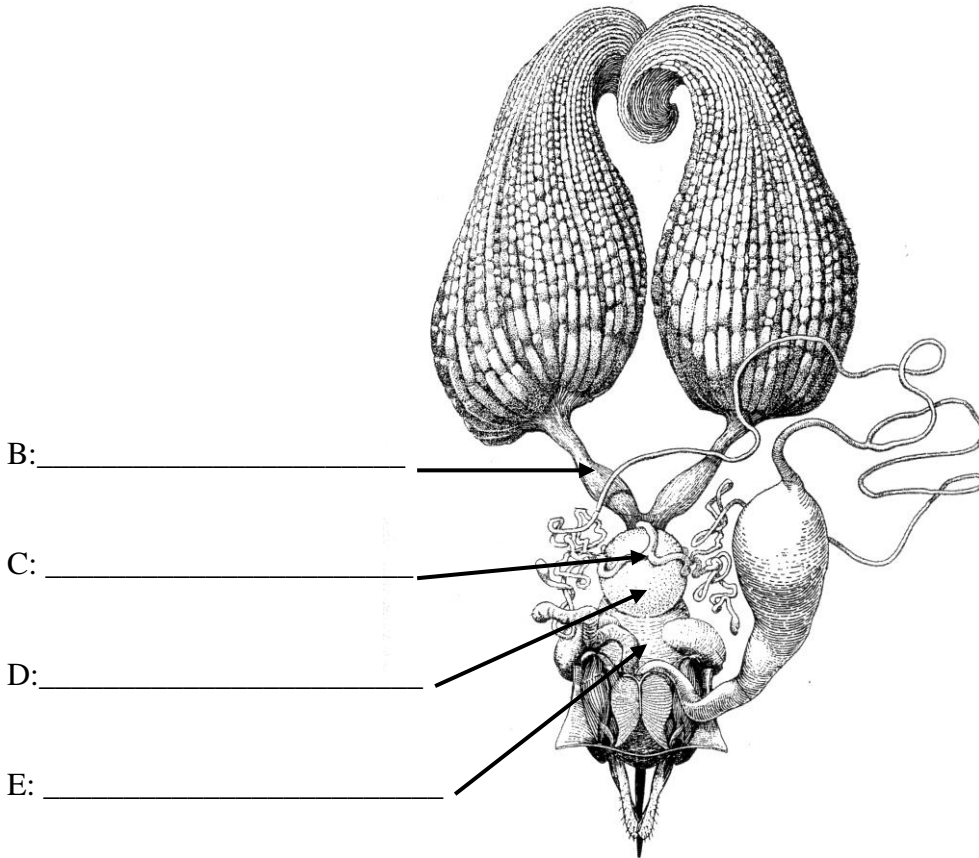
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14 (a) Label the diagram below.

5

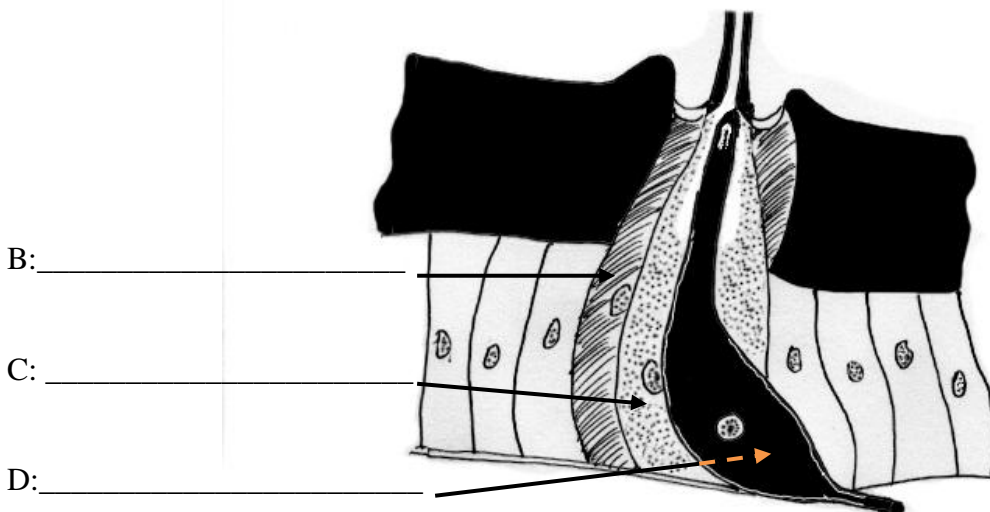
A: Title _____



15 (a) Label the diagram below.

4

A: Title _____



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