

THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874

Registered Charity No. 1185343

EXAMINATION FOR PROFICIENCY IN APICULTURE MODULE 5 HONEY BEE BIOLOGY

Candidate Number:

24th April 2021 Time Allowed 1¾ 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 and 30 minutes on Section C.

Unless stated otherwise questions apply to honey bees.

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 What is the term used to describe moulting in honey bee larvae?
- Q2 How many malpighian tubules are there in a honey bee larva?
- Q3 What does the term proximal mean?
- Q4 Name the large muscles that enable the bee to fly.
- Q5 Where is the cibarium?
- Q6 Where is the Arnhart gland located?
- Q7 Name the tergite glands of the queen that produce pheromones.
- Q8 What are plumose hairs?
- Q9 Sensilla basiconica on the antenna are used to sense what?
- Q10 How many ostia does a bee have?

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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) | Name the diagram A and identify the items B-H on the diagram provided. | 4 |
| | (b) | Briefly describe where these organs are found in a honey bee. | 2 |
| | (c) | List the waste products excreted through these organs. | 2 |
| | (d) | Describe how these waste products are then excreted from the honey bee. | 5 |
| | (e) | What are the other waste products from metabolism? | 2 |
| Q12 | (a) | Name the sensillum shown on the diagram provided on the last page. | 1 |
| | (b) | List the items A-D on the diagram provided. | 2 |
| | (c) | Give the scientific name of six other sensilla and the stimuli to which they react. | 12 |
| Q13 | | Describe the location, structure, and function of: | |
| | (a) | spiracles; | 3 |
| | (b) | tracheae; | 4 |
| | (c) | air sacs; | 4 |
| | (d) | tracheoles. | 4 |
| Q14 | (a) | Describe the constituent parts of brood food. | 4 |
| | (b) | Describe the variations in brood food and feeding that will affect caste determination. | 11 |
| Q15 | | Write short notes on the following: | |
| | (a) | neurosecretory cells; | 2 |
| | (b) | corpora cardiaca; | 5 |
| | (c) | prothoracic glands; | 4 |
| | (d) | corpora allata. | 4 |

SECTION C (30 marks)

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

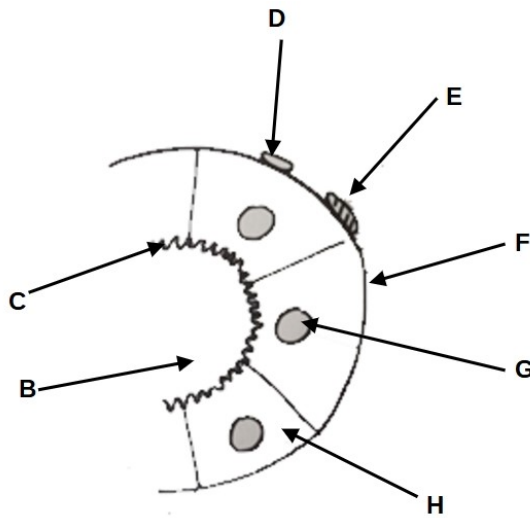
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|-----|-----|---|----|
| Q16 | (a) | Identify the items A-J shown on the diagram of an ommatidium. | 5 |
| | (b) | Describe the component parts and the location and function of this organ. | 19 |
| | (c) | Describe the structure and function of the ocelli. | 6 |
| Q17 | (a) | What are the anatomical and physiological differences between summer and winter worker honey bees and how do these differences arise? | 7 |
| | (b) | Describe the production of an egg before fertilisation. | 8 |
| | (c) | Describe the structural of a fertilised egg. | 15 |

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Q11 (a) Name the diagram **A** and identify the items **B-H** on the diagram below.

4

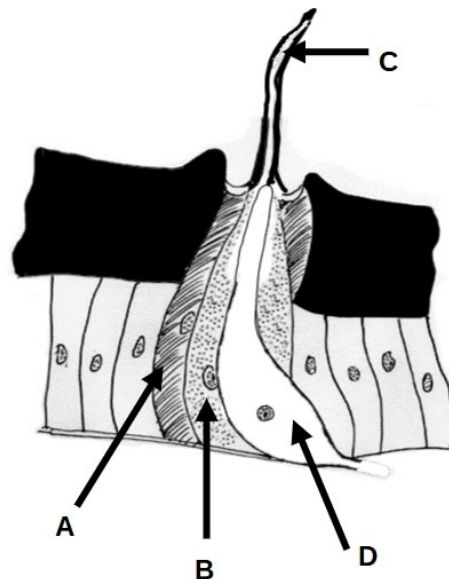


Cross section of **A**

- (a).....
- (b).....
- (c).....
- (d).....
- (e).....
- (f).....
- (g).....
- (h).....

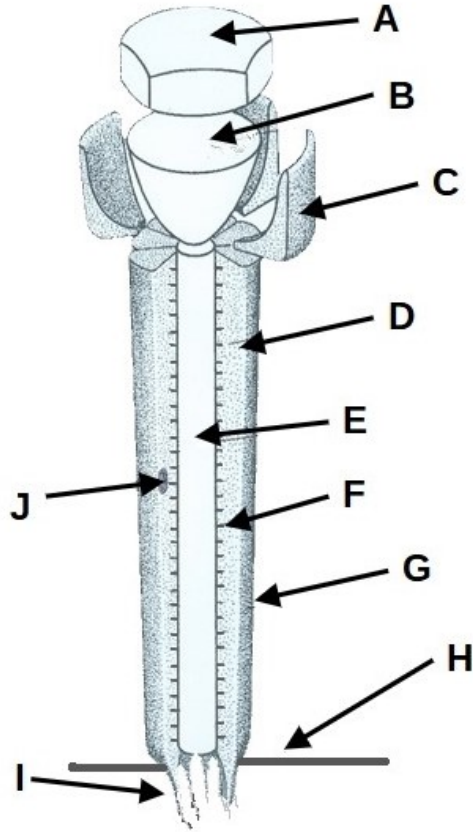
Q12 (b) List the items A-D on the diagram below.

2



- (a).....
- (b).....
- (c).....
- (d).....

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- (a).....
- (b).....
- (c).....
- (d).....
- (e).....
- (f).....
- (g).....
- (h).....
- (i).....

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