

# THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874

Registered Charity No. 212025

## EXAMINATION FOR PROFICIENCY IN APICULTURE MODULE 5 HONEY BEE BIOLOGY

Candidate Number:

23<sup>rd</sup> March 2019 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 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 Name one exocrine gland in the head of a worker bee. ....
- Q2 Where does the queen honey bee store sperm? .....
- Q3 What name is given to the individual elements of the compound eye? .....
- Q4 What is the function of the micropyle? .....
- Q5 What is the name given to the valves of the bee's heart? .....
- Q6 Where is the fibula found? .....
- Q7 How many annuli are there in the flagellum of a worker bee? .....
- Q8 Where are the hamuli to be found? .....
- Q9 What is produced at the tergum of A7 on a worker bee? .....
- Q10 What is the function of the Malpighian tubules? .....

**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) | Briefly give the timing and development of the worker bee from the time the egg is laid in a cell until emergence from the cell. | 12 |
|     | (b) | List three factors affecting the development time of the honey bee.  | 3  |
| Q12 | (a) | Tabulate four differences, apart from fat bodies, between summer and winter worker bees.   | 4  |
|     | (b) | Name the three types of cell within the fat body and state the stages of the life cycle where they occur.                        | 3  |
|     | (c) | Briefly describe the fat body in the larval and pupal stage.   | 8  |
| Q13 | (a) | List the glands of the endocrine system in the honey bee.  | 4  |
|     | (b) | Briefly outline where each is situated and its function.   | 11 |
| Q14 | (a) | What are the special structures and functions of the front legs of the worker honey bee?   | 6  |
|     | (b) | Label the diagram provided.  | 4  |
|     | (c) | Detail the structure and use of part F in the diagram.   | 5  |
| Q15 |     | Laying workers may develop in a colony following a period of time when the colony is queenless.                                  |    |
|     | (a) | How does the laying worker differ from the queen with regard to reproduction?  | 9  |
|     | (b) | What causes the development of laying workers?   | 2  |
|     | (c) | How can the presence of a drone laying queen be recognised?  | 4  |

## SECTION C (30 marks)

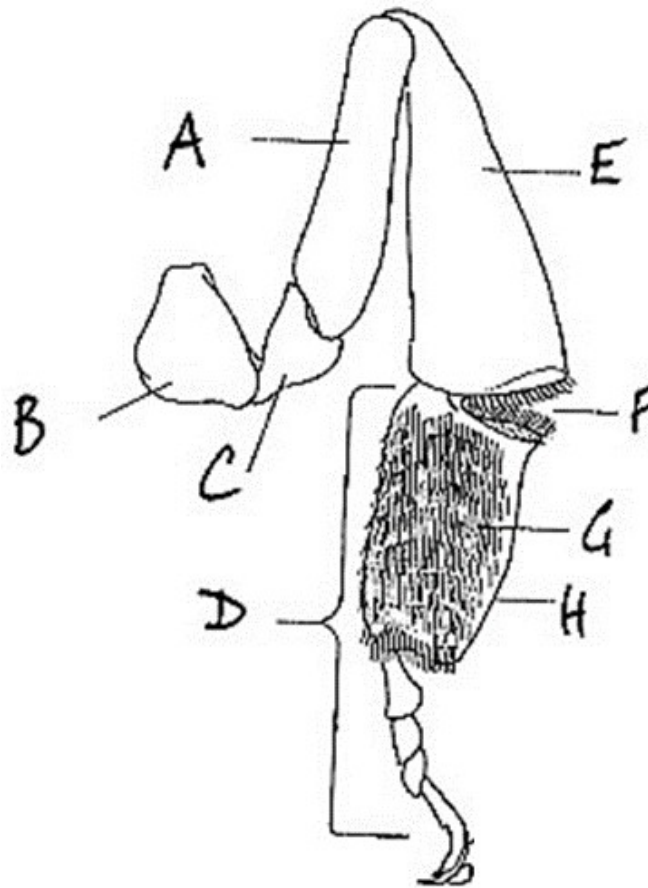
Answer **ONE** question from this section. Give *labelled* diagrams where applicable.

- |     |     |   |    |
|-----|-----|---|----|
| Q16 | (a) | Label the diagram provided.   | 4  |
|     | (b) | Describe ingestion, digestion, absorption and excretion in the adult honey bee. | 26 |
| Q17 | (a) | Label the diagram provided.   | 3  |
|     | (b) | Name the three main components in sting venom.                                  | 3  |
|     | (c) | Explain the process of stinging a person from the moment a bee lands.           | 24 |

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Q14 (b) Label the diagram provided.

4



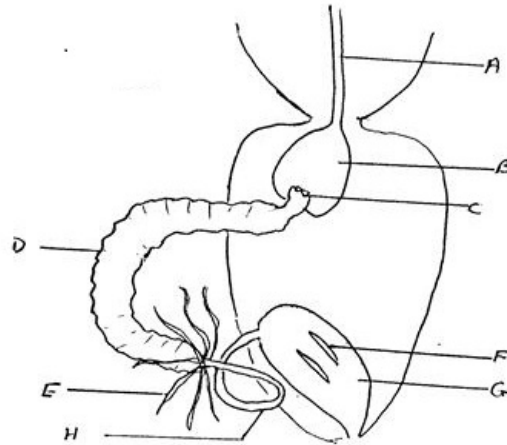
- A \_\_\_\_\_
- B \_\_\_\_\_
- C \_\_\_\_\_
- D \_\_\_\_\_
- E \_\_\_\_\_
- F \_\_\_\_\_
- G \_\_\_\_\_
- H \_\_\_\_\_

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Q16 (a) Label the diagram provided.

4



A \_\_\_\_\_

B \_\_\_\_\_

C \_\_\_\_\_

D \_\_\_\_\_

E \_\_\_\_\_

F \_\_\_\_\_

G \_\_\_\_\_

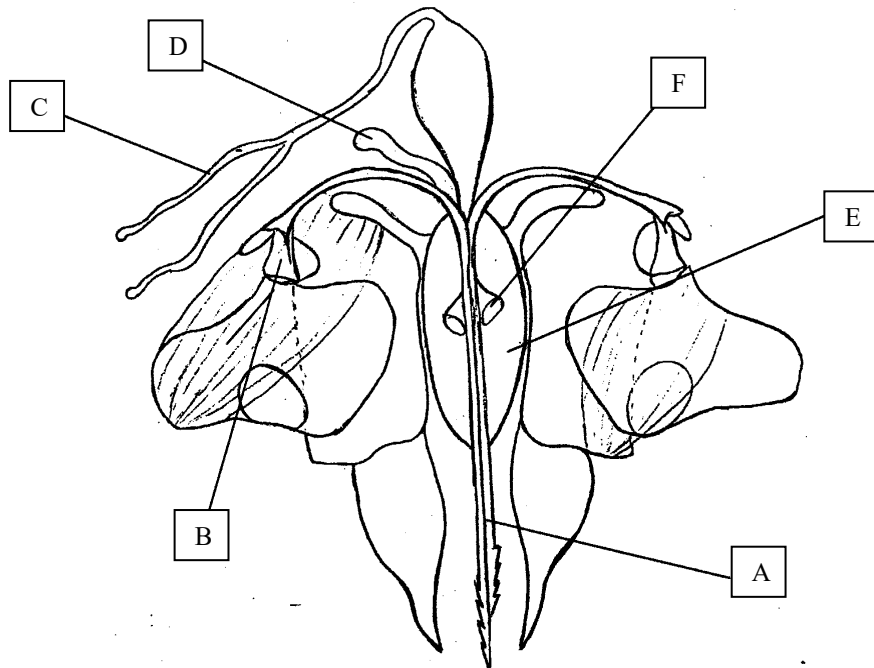
H \_\_\_\_\_

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Q17 (a) Label the diagram provided.

3



- A \_\_\_\_\_
- B \_\_\_\_\_
- C \_\_\_\_\_
- D \_\_\_\_\_
- E \_\_\_\_\_
- F \_\_\_\_\_

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