

THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874

Registered Charity No. 212025

EXAMINATION FOR PROFICIENCY IN APICULTURE MODULE 5 HONEY BEE BIOLOGY

Candidate Number:

13th November 2021 Time Allowed 100 mins

Instructions to Candidates

Read the questions carefully. Answer All Sections. It is recommended not to spend more than 10 minutes on Section A, 60 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 are the large muscles in the thorax called?
- Q2 What are the structures which link the fore and rear wings in flight?
- Q3 What is the name of the narrow waist that is at the anterior end of the abdomen?
- Q4 How many ommatidia are present in each compound eye of a worker bee?
- Q5 Where is the valve fold located?
- Q6 Where is the antenna cleaner found?
- Q7 How many pairs of spiracles does a honey bee have?
- Q8 Where is the flabellum to be found?
- Q9 Name an enzyme added to nectar by a honey bee?
- Q10 Where is semen stored in a drone?

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) Where is haemolymph found in the body of an adult honey bee? 1
(b) What are the constituents of the haemolymph? 2
(c) List the functions of the haemolymph. 6
(d) Identify A-D on the diagram provided. 2
(e) Briefly describe the flow of haemolymph around the body. 4
- Q12 List the anatomical differences between a queen, worker, and drone for mandibles, flagellum, compound eyes, ovaries and abdomen. 15
- Q13 (a) Identify A-F on the diagram provided. 3
(b) Where is the peritrophic membrane found, and what is its suggested function? 2
(c) Briefly discuss the functions and operation of:
(i) B on the diagram; 4
(ii) D on the diagram. 6
- Q14 (a) Identify A-J on the diagrams provided. 5
(b) Name the gland present in the foot and describe its function. 3
(c) Briefly describe the action of the foot on rough surfaces and smooth surfaces. 7
- Q15 (a) Briefly explain the role of the fat body in the adult honey bee, and how it differs in summer and winter bees. 7
(b) Describe the wax glands and include an account of the production of wax. 8

SECTION C (30 marks)

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

- Q16 (a) Identify A-J on the diagram provided. 5
(b) Describe the sting mechanism. 15
(c) Describe the action of stinging. 5
(d) List the main chemicals in bee venom. 5
- Q17 (a) Briefly describe the process of moulting. 6
(b) Describe fully the development of a worker from egg hatching to imago emergence. 24

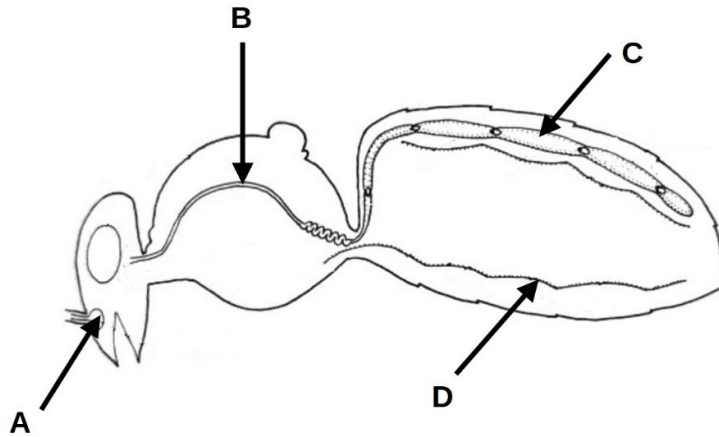
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Q11 (d) Identify A-D on the diagram.

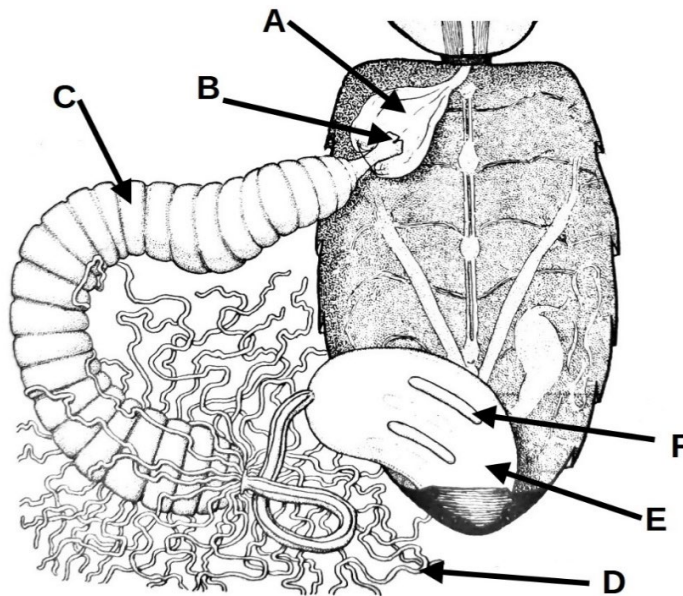
2



- A
- B
- C
- D

Q13 (a) Identify A-F on the diagram.

3



- A
- B
- C
- D
- E
- F

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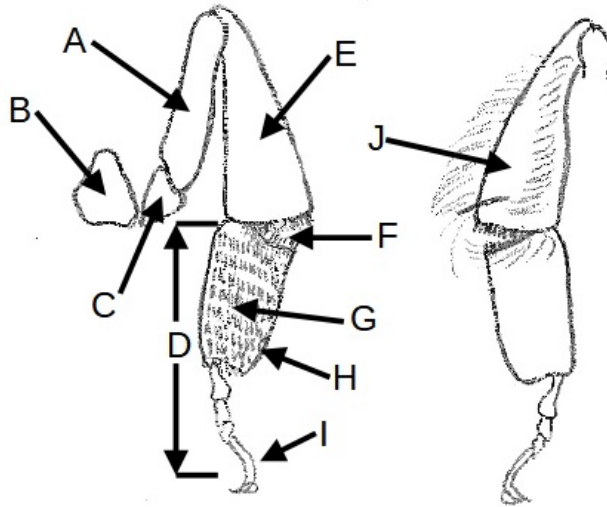
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Q14 (a) Identify A-J on the diagrams.

5

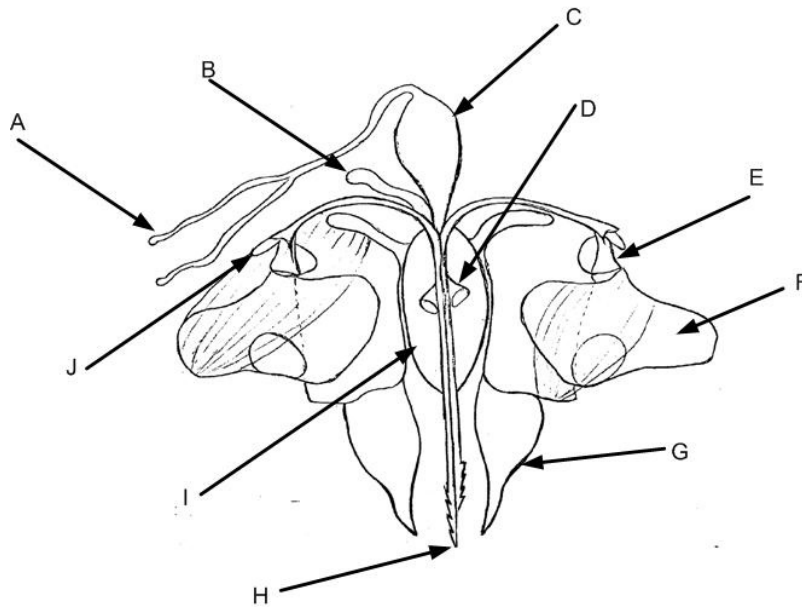


- A
- B
- C.....
- D
- E

- F
- G
- H
- I
- J

Q16 (a) Identify A-J on the diagram.

5



- A
- B
- C.....
- D
- E

- F
- G
- H
- I
- J

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