

THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874

Registered Charity No. 212025

EXAMINATION FOR PROFICIENCY IN APICULTURE MODULE 5 HONEYBEE BIOLOGY

Candidate Number:

9th November 2013 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.

- Q1 Where are ommatidia found?
- Q2 Where are oenocytes found?
- Q3 How many ostia does a bee have?
- Q4 On which legs of the honeybee are the antenna cleaners located?
- Q5 Which hormone promotes larval moulting?
- Q6 How many malpighian tubules does the honeybee larva have?
- Q7 How many wax glands does the worker honeybee have?
- Q8 Give the scientific name of the honeybee simple eyes and their number.
- Q9 What structure prevents the tracheal tubes from collapsing?
- Q10 Name the membrane which supports the heart.

PLEASE HAND IN THIS SHEET AT THE END OF THE EXAMINATION

MODULE 5 HONEYBEE BIOLOGY

9th November 2013

SECTION B (60 marks, 15 for each question)

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

Marks

- Q11 (a) Label the following items on the diagram provided: 6
Venom sac
Venom gland
Umbrella valves
Bulb
Lancet
Quadrante plate
- (b) Briefly describe the action of the sting. 9
- Q12 (a) Briefly describe the exact location and function of the Organ of Johnston. 5
(b) Give the scientific name of five sensilla on the antennae of the worker bee and the stimuli to which they react. 10
- Q13 Describe briefly with the aid of simple diagrams the role of the indirect flight muscles in flight. 15
- Q14 With the aid of a simple labelled diagram describe the structure and function of the adult honeybee cuticle. 15
- Q15 (a) Label parts A- G on the diagram provided. 7
(b) Describe how sperm is produced and stored in the drone. 8

SECTION C (30 marks)

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

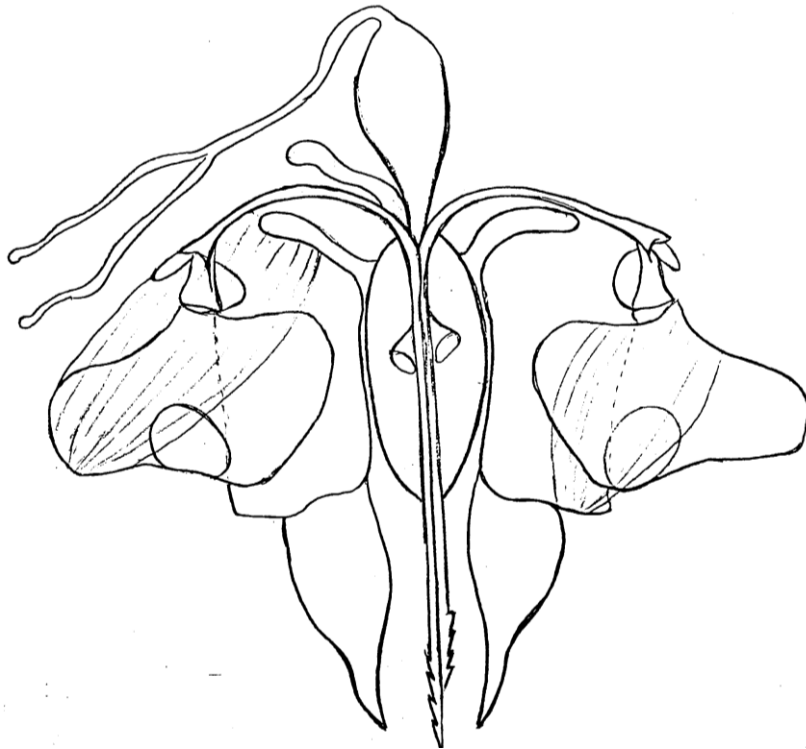
- Q16 (a) On the diagram provided mark and label the position of the exocrine glands of the worker honeybee. 8
(b) For what are the Arnhart glands used? 1
(c) At what age do the wax glands develop? 1
(d) Describe the function of the food-producing glands and other factors in caste differentiation. 20
- Q17 Describe with the aid of a simple schematic diagram the complete digestive and excretory process of the honeybee. 30

MODULE 5 HONEYBEE BIOLOGY
9th November 2013

Q11 (a) Label the following items on the diagram below:

6

- Venom sac
- Venom gland
- Umbrella valves
- Bulb
- Lancet
- Quadrate plate

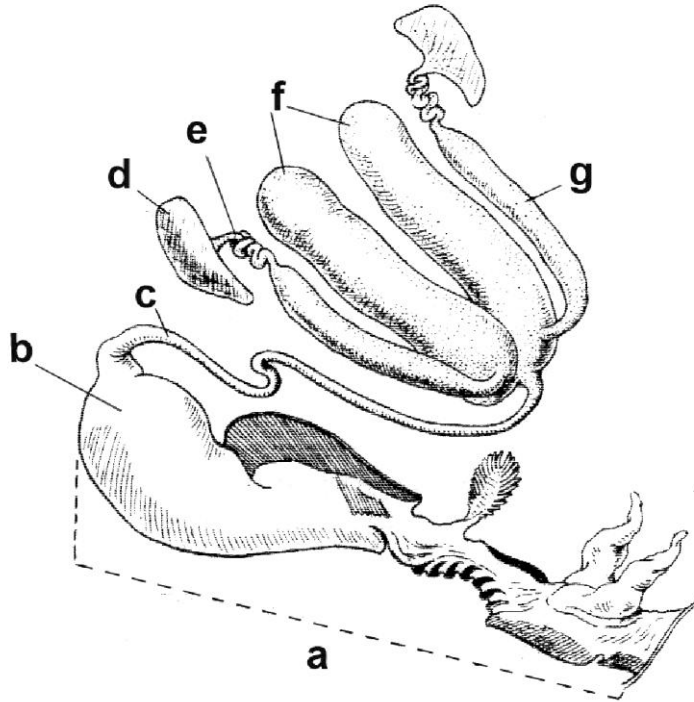


PLEASE HAND IN THIS SHEET AT THE END OF THE EXAMINATION

MODULE 5 HONEYBEE BIOLOGY
9th November 2013

Q15 (a) Label parts A- G on the diagram below.

7



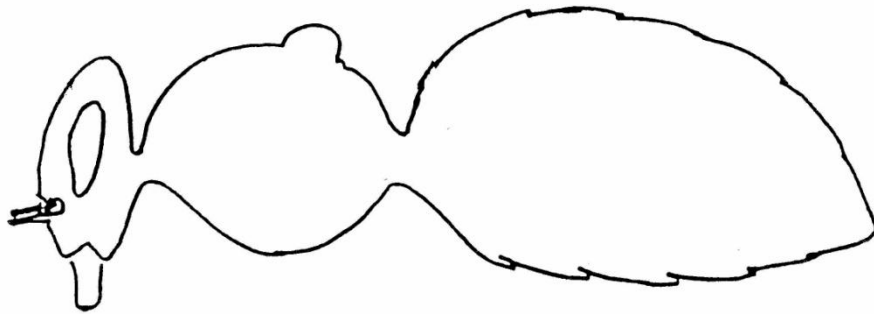
- a)
- b)
- c)
- d)
- e)
- f)
- g)

PLEASE HAND IN THIS SHEET AT THE END OF THE EXAMINATION

MODULE 5 HONEYBEE BIOLOGY
9th November 2013

- Q16 (a) On the diagram below mark and label the position of the exocrine glands of the worker honeybee.

8



PLEASE HAND IN THIS SHEET AT THE END OF THE EXAMINATION