

# THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874

Registered Charity No. 212025

## EXAMINATION FOR PROFICIENCY IN APICULTURE MODULE 5 HONEYBEE BIOLOGY

Candidate Number:

24<sup>th</sup> March 2012

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.**

Please start each question on a new side of paper.

### 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 do the spermatozoa penetrate to fertilize the egg? .....
- Q2 Name the organ in the queen where sperm are stored. ....
- Q3 On which segment of the leg of the worker honeybee is the corbicula? .....
- Q4 How many malphigian tubules does a larva have? .....
- Q5 Where are the Arnhart glands found? .....
- Q6 Name the valve at the posterior end of the ventriculus. ....
- Q7 How many ostia does the honeybee heart have? .....
- Q8 Name the spiral thickenings of cuticle which maintain the tube-like shape of the tracheae. ....
- Q9 Give the name of the constriction between the thorax and abdomen of the honeybee. ....
- Q10 Where are the umbrella valves located in the honeybee? .....

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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) Label A-E on the diagram provided. 5  
(b) Describe briefly the function of F and G. 2  
(c) Describe briefly the function of the cuticle. 8
- Q12 (a) Label A-G on the diagram provided. 7  
(b) Give the term for moulting and the hormone that causes this process. 1  
(c) Briefly describe the function of F and G. 5  
(d) Which glands in the adult bee are derived from G and what is their function? 2
- Q13 (a) Where is the nasonov gland located? 2  
(b) Identify **five** of the chemicals secreted by the nasonov gland. 5  
(c) Give a brief account of the different situations where workers might deploy this gland. 8
- Q14 (a) Label A-E on the diagram provided. 5  
(b) Give the scientific name of five **other** sensilla and the stimuli to which they react. 10
- Q15 (a) Describe briefly the location, structure and secretory process of the wax glands. 10  
(b) List the main constituents of wax. 5

## SECTION C (30 marks)

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

- Q16 (a) Describe with the aid of a labelled diagram the queen's reproductive system. 15  
(b) Describe the production and fertilisation of an egg. 15
- Q17 (a) Discuss the structural and physiological differences between laying workers and normal workers and the role of pheromones in bringing about these differences. 15  
(b) Explain how feeding brings about caste determination in the honeybee. 15

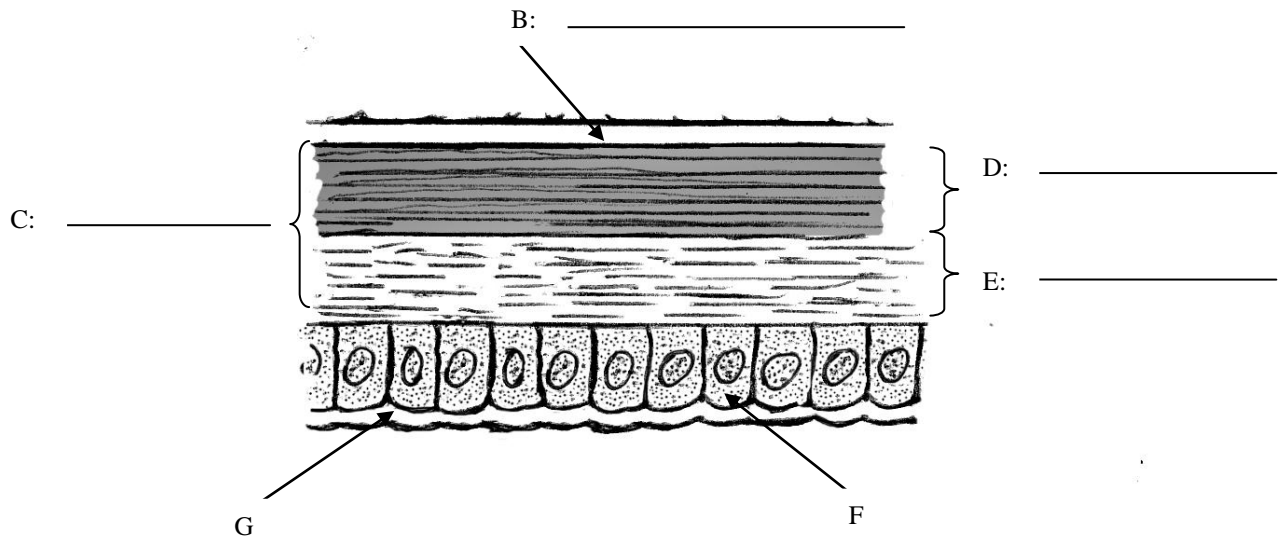
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Q11 (a) Label A-E on this diagram.

5

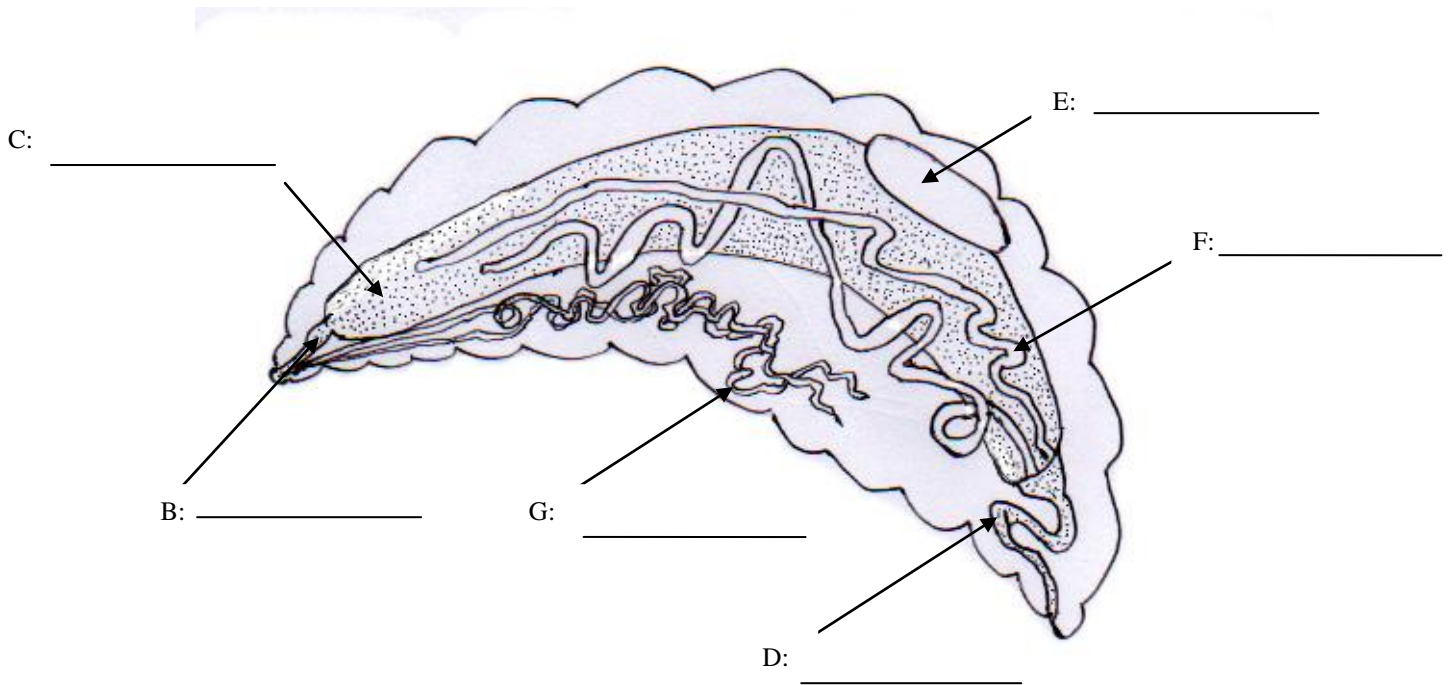
A: Title: \_\_\_\_\_



Q12 (a) Label A-G on the diagram.

5

A: Title: \_\_\_\_\_



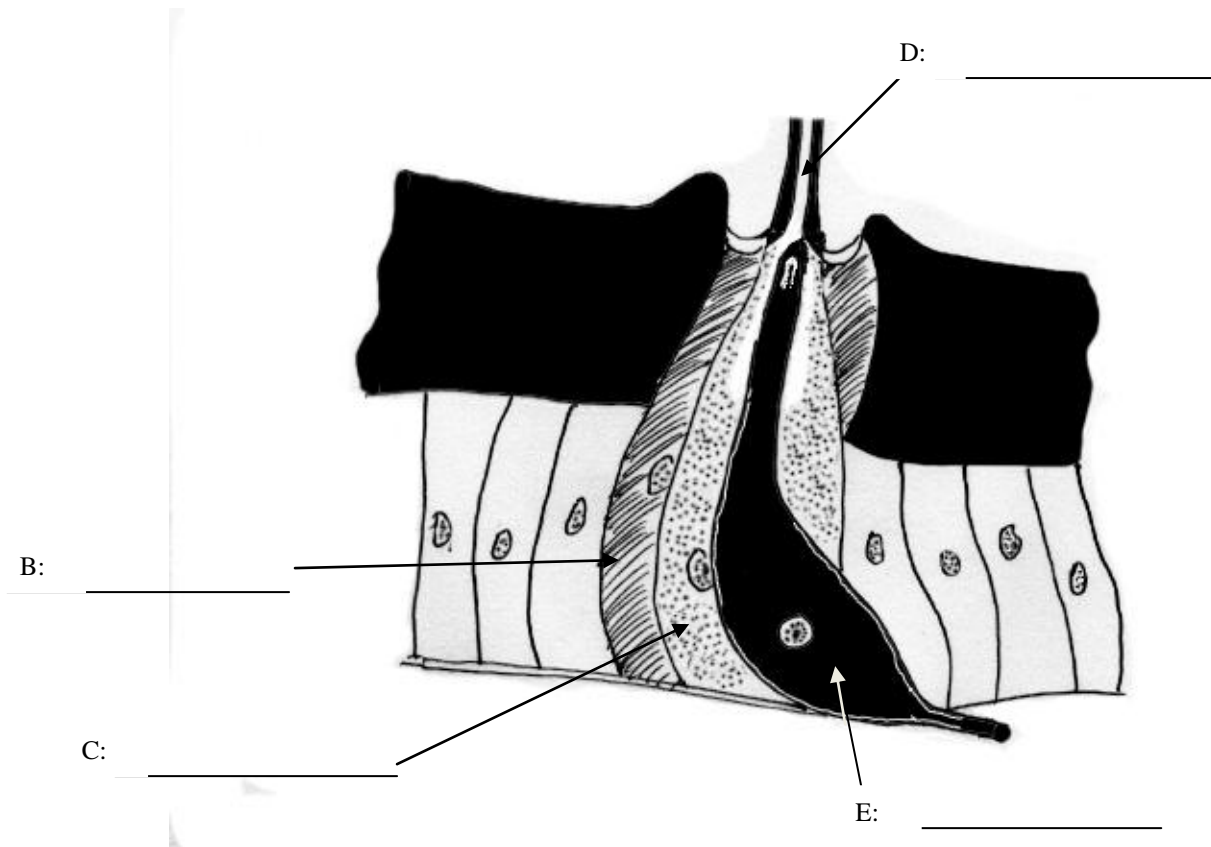
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Q14 (a) Label A-E on the diagram below.

5

A: Title \_\_\_\_\_



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