

THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874

Registered Charity No. 212025

EXAMINATION FOR PROFICIENCY IN APICULTURE

MODULE 6 HONEYBEE BEHAVIOUR

23rd March 2013 Time Allowed 1½ hours

Candidate Number:

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 How many days after emergence is the queen sexually mature?
- Q2 Give a circumstance that may cause the queen's egg laying rate to reduce?
- Q3 In a brood nest at its peak size, what are the proportions of eggs to larvae to sealed brood?
- Q4 Give a behavioural characteristic exhibited by a guard bee
- Q5 Name a way that bees prevent honey deteriorating over the winter.
- Q6 Give the average ratio of sugars to water found in the honey sac.
- Q7 is the breakdown of sucrose + water into glucose and fructose and it requires the enzyme
- Q8 How do foragers offload loads of propolis on their returning to the colony?
- Q9 What is one of the primary causes of swarm preparations in a colony?
- Q10 Give a reason why a queen may be superseded.

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) List the factors that initiate comb building. 5
(b) Describe how comb is constructed. 10
You need not give the chemical composition of beeswax.
- Q12 (a) Name 5 different dances used by the honeybee. 5
(b) Briefly describe 2 of the dances involved in swarming. 10
- Q13 A worker honeybee has been given the direction and distance to a new forage source by observing a dancing bee.
(a) List the navigational methods used for determining direction and distance during the first flight of a new recruit to find the new forage source. (You do not need to describe the any dances) 6
(b) On arrival at the flowers what additional cues confirm to the bee that this is the correct forage source? 3
(c) What other aids may she use on her return to the hive and on subsequent flights to the same forage source? 6
- Q14 (a) What is the name given to the phenomenon where workers eat eggs laid by other worker bees and show aggression towards the laying workers? 1
(b) Under which circumstances would the eggs of a laying worker be allowed to develop? 3
(c) How is this form of social control of benefit to the colony in a queen right colony? 11
- Q15 (a) List the duties that a worker honeybee undertakes between her emergence in April until her death and the average ages these duties these occur? 7
(b) How do these duties differ for a worker honeybee emerging in October until her death? 8

SECTION C (30 marks)

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

- Q16 (a) Describe how a honeybee colony regulates its pollen reserves? 12
(b) Describe the effects of the following pathogens on honeybee function or behaviour:
(i) *Nosema* 12
(ii) Sac-brood Virus 6
- Q17 (a) Describe how a normal colony of honeybees regulates cluster temperature in a hive:
(i) as the ambient temperature falls from about 18°C to below -5°C; 11
(ii) as the ambient temperature rises from about 20°C to over 36°C. 16
(b) Describe the behaviour of an individual bee in a winter cluster. 3