

# THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874

Registered Charity No. 212025

## EXAMINATION FOR PROFICIENCY IN APICULTURE

### MODULE 7 SELECTION AND BREEDING OF HONEYBEES

24<sup>th</sup> March 2012

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.**

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 When will be the next year that the International Queen Marking colour is white? .....
- Q2 Which country is identified as the original source of *Apis mellifera ligustica*? .....
- Q3 Where is a 'valve fold' to be found? .....
- Q4 What is an allele? .....
- Q5 When does the phenomenon known as 'crossing-over' occur in reproduction? .....
- Q6 Where is the 'sperm pump' located? .....

**In the following questions please circle the correct answer:**

- Q7 The "Miller Method" of producing queen cells involves:  
a) selecting swarm cells b) triangulated foundation c) splitting a colony d) double grafting.
- Q8 The approximate number of sperm retained in the spermatheca after successful mating is:  
a) 7 million b) 15 million c) 20 million d) 30 million.
- Q9 The gas used to narcotise queens in Instrumental Insemination is:  
a) Nitrogen b) Carbon dioxide c) Hydrogen d) Chloroform.
- Q10 What is the natural fate of diploid drones?  
a) failure to fly b) gynandromorphy c) eviction by workers d) destroyed on hatching.

**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) Using a table compare the advantages and disadvantages of in breeding and out breeding in the honeybee. 10  
(b) Name two methods beekeepers can use to develop a 'pure' strain of honeybee and suggest difficulties likely in each. 5
- Q12 (a) Describe a process for identifying and dealing efficiently with a large colony with laying workers. 11  
(b) Briefly discuss how a colony of laying workers develop including the possible role of colony pheromones. 4
- Q13 (a) List what is known and what is uncertain about Drone Congregation Areas (DCAs). 10  
(b) What are thought to be the advantages of the existence of DCAs for the honeybee? 4  
(c) At what age in days, after emergence, is a drone considered to be sexually mature? 1
- Q14 (a) What are the signs of queenlessness? 7  
(b) How are emergency queen cells distinguished from other queen cells? 4  
(c) Why is the use of queens raised from emergency cells not considered to be a good method of requeening a colony? 4
- Q15 (a) List 5 significant structures in the drone reproductive system and state their function. 10  
(b) Explain the terms 'haploid', and 'endophallic eversion' with reference to honeybees. 4  
(c) Where does meiosis for the production of honeybee sperm occur? 1

## SECTION C (30 marks)

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

- Q16 (a) Describe in detail how to establish and manage ten mini-hives in a mating apiary with a target of producing 20 mated queens during the season. 20  
(b) Tabulate the advantages and disadvantages of mini hives for mating virgin queens compared to the use of nucleus colonies with normal brood combs? 10
- Q17 (a) A large, queen right colony with two supers, in an urban garden, has become aggressive. Explain how to proceed with the introduction of a mated queen received through the post. 20  
(b) Describe the process of caging a mated queen for introduction elsewhere a few days later. 6  
(c) Apart from aggression, give two reasons, with explanations, that could require a colony to be requeened. 4