

THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874

Registered Charity No. 212025

EXAMINATION FOR PROFICIENCY IN APICULTURE MODULE 7 SELECTION AND BREEDING OF HONEYBEES

14th November 2015 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.

Please write your answers on the question paper.

- Q1 Give the full latin name of one sub-species of honey bees.
- Q2 What years are indicated by the colour yellow using the International queen marking code?
- Q3 Name one introduction cage from which the queen cannot exit for a few days.
- Q4 What part of the egg is penetrated by sperm?
- Q5 Give a sign in the colony that differentiates between a drone laying queen and a laying worker?
- Q6 How much sperm is used to instrumentally inseminate a virgin queen?
- Q7 What proportion of the queens wings are removed when clipping?
- Q8 How many chromosomes does a diploid drone have?
- Q9 What is the most common subspecies of honeybee found in Germany?
- Q10 What is the approx. number of queen cells expected when a colony is preparing to supersede?

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

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| Q11 | (a) | How can queenlessness be confirmed in a colony? | 2 |
| | (b) | List five factors that can result in a colony becoming queenless and identify, giving the reason, whether the colony can normally recover from these factors without intervention. | 10 |
| | (c) | What happens if a colony is queenless for more than 3 weeks and why does this occur? | 3 |
| Q12 | (a) | Define parthenogenesis. | 1 |
| | (b) | How does parthenogenesis affect inheritance in honey bees? | 3 |
| | (c) | What are the advantages of parthenogenesis to the beekeeper? | 3 |
| | (d) | Other than docility and low swarming list what other important characteristics a queen breeder will select for. | 8 |
| Q13 | | Give a detailed account of the mating behaviour of queens and drones. | 15 |
| Q14 | | Draw a table under the headings of sub-species, tongue length, physical characteristics and behaviour traits of four common subspecies of honey bee found in Europe. | 15 |
| Q15 | (a) | What is meant by 'in breeding' and 'out breeding'? | 2 |
| | (b) | Is it possible for the British Black bee and the African bee (<i>Apis mellifera scutellata</i>) to mate and produce viable offspring? Explain your answer. | 2 |
| | (c) | How can the quality of a queen, that has been used for breeding, be evaluated? | 4 |
| | (d) | What are the potential advantages and problems when cross breeding subspecies of honey bees? | 7 |

SECTION C (30 marks)

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

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| Q16 | (a) | Describe the process of meiosis. | 10 |
| | (b) | Give an outline account of the process of egg production. | 10 |
| | (c) | Describe the process of fertilisation and egg laying. | 10 |
| Q17 | (a) | Describe the process of setting up mating nuclei for the production of 30 queens and how to increase the probability of selective breeding with desirable drones. | 22 |
| | (b) | Describe how various diseases and external conditions may impact adversely on the quality of the queens produced. | 8 |