THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874 Registered Charity No. 212025

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

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 In the honeybee the development of the unfertilised egg is called? ……..

Q2 Name one pathogen that can affect queen rearing ……

Q3 At what age is a drone considered to be sexually mature after emergence? ……

Q4 At what age after the egg was laid in a queen cell is it considered to be right for introduction into a nucleus? ……

Q5 How many pairs of homologous chromosomes are found in the cells of the female bee? ……..

Q6 What is the optimum age of a larva for grafting? ……...

Q7 What was the International Queen Marking Colour for 2009? ……..

Q8 How long after emerging is it considered unlikely that the queen will be able to successfully mate? ……..

Q9 What is the name given to the differing but similar genes of a particular locus? ……

Q10 Which gas is used to anaesthetise the queen for instrumental insemination? ……..

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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) Describe two methods of marking queens, outlining the advantages and disadvantages of each method. 12

(b) State the precautions to be taken when holding a queen in the hand to clip its wing. 3

Q12 Give an account of how to remove a queen from a vicious colony ready for the introduction of a new queen. 15

Q13 Complete the table provided. 15

Q14 Describe the development and fertilisation of a worker egg. 15

Q15 (a) Within the context of cell division explain what is meant by cross over. 3

(b) Describe how it is possible to derive 'undesirable' characteristics from mating two strains of bees with good characteristics. 6

(c) Given queen Cc mating with drone c, what will the outcome be in the generation one, where C is dominant and c is recessive? Note this is not the sex allele. 6

SECTION C (30 marks)

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

Q16 (a) Label the diagrams provided 15

(b) Describe the function of each part a to u in 16a. 15

Q17 A group of 6 beekeepers in a local association, each with 5 to 10 colonies want to improve their local bees. The area encompasses both suburban and rural areas. (They have available to them an isolated moorland site 30 miles away where the nearest know beekeeper is over 7 miles away.)

(a) Give the important criteria for the selection of the breeder colonies. 10

(b) Provide a timescale and discuss the equipment needed for the planned improvement. 20

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Q13 Complete the table below. 15

Race	*Apis mellifera mellifera*	*Apis mellifera carnica*	
Size and shape		Medium slim	
Tomenta	Narrow, sparse, dark		Broad, yellow
Proboscis	Short	Long	Long
Cubital index		2.4- 3.0	2.0 – 2.7
Discoidal shift			Positive
Swarmyness			Non swarmy
Temper	Variable		
overwintering	Thrifty		
Spring build up		Early	

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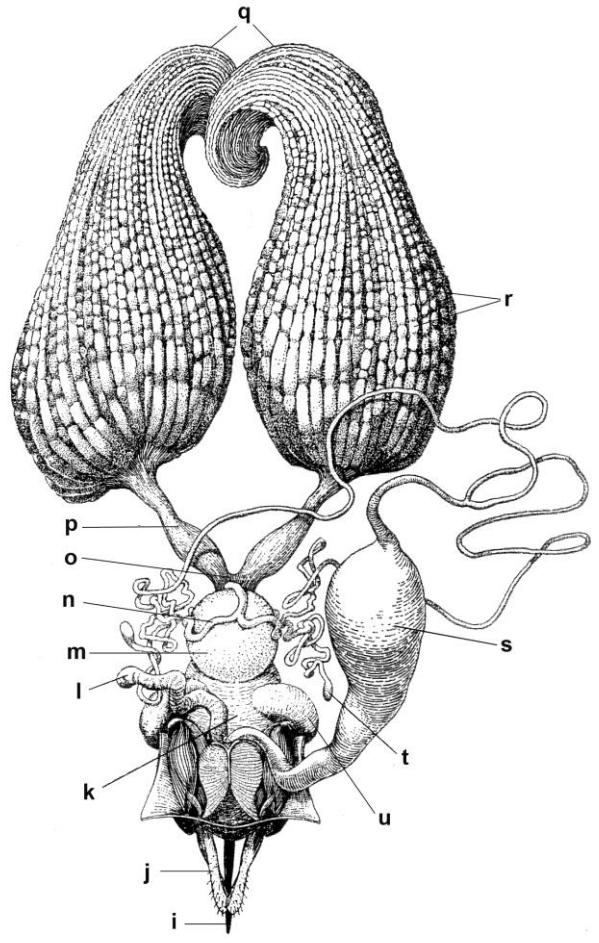
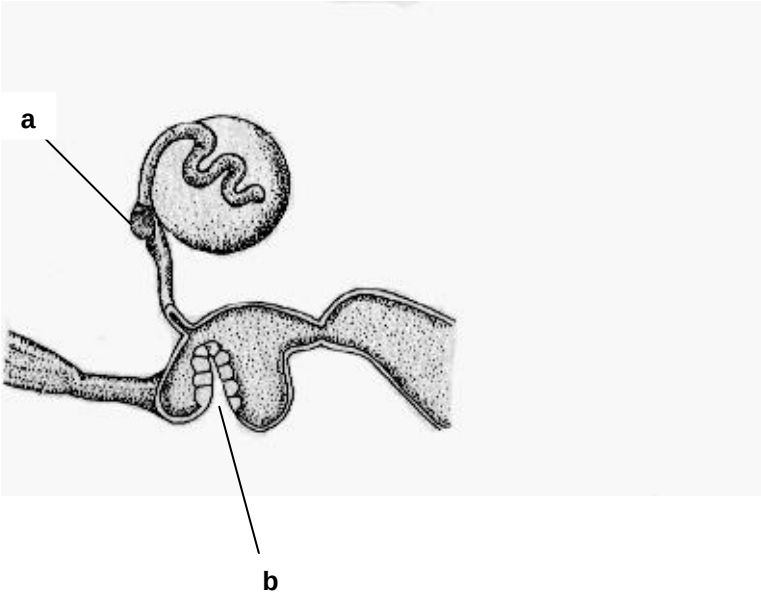
Q16 (a) Label the diagrams below 15





a	o
b	p
i	q
j	r
k	s
l	t
m	u
n	

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