Examination for the National Diploma in Beekeeping.

March 23rd 2002.

Paper A : Practical.

Instructions to candidates:-
Time allowed 3 hours.
Answer Four questions only.
Use only Black pen for the text.
Pencil may be used for the diagrams.
Marks will be awarded for clear diagrams where relevant.
Write on one side of the paper only.
Write your candidate number on the top of each sheet of answer paper.

Q1. a) Discuss the outbreak of chemical resistant *Varroa* in England and Wales under the following headings:-
i) Scientific name.
ii) Initial resistance and actions taken.
iii) Statutory legislation.
b) Outline a local and national strategy for dealing with this problem.

Q2. a) Give the scientific name for the Small Hive Beetle (SHB).
b) Describe briefly Five ways in which the SHB could be imported into the UK.
c) Describe the anatomy of the egg, larval and adult stages of SHB.
d) Briefly describe the life cycle of SHB.
e) Describe the damage caused by SHB.
f) List methods of control used in other countries.

Q3. a) Make a list of the factors to consider when setting up an association apiary.
b) Write a set of rules to be handed to each user of the apiary.
c) Discuss what extra would be required if this apiary is also used as a teaching apiary where up to 20 students attend a teaching session.

Q4. a) Distinguish between the terms "soft set", "seeded" honey and naturally granulated honey.
b) Describe the processing of a 10 litre (14.5 kg) bucket of coarsely filtered, naturally granulated English honey into pound jars of liquid honey for sale to a local shop. Include details of the time and temperatures necessary to ensure that rapid re-granulation does not occur, giving a shelf life of 4 - 6 months.
c) Name the current English regulations.
d) List the basic labelling requirements to satisfy current regulations for a one pound jar of English honey.

Q5. a) Discuss the factors involved in initiating the urge to swarm in a colony of honeybees.
b) Explain the reasoning behind the so called "10 day inspection system" and the important criterion upon which it relies.
c) On a routine inspection in an apiary where honey production is the main aim, detail what action should be taken on discovering:-
i) A small number of queen cells containing eggs and young larvae?
ii) A large number of emergency queen cells?

Q6. a) It is suspected that a colony of honey bees is queenless. What steps should be taken by the beekeeper in an attempt to confirm this suspicion?

b) A honey bee queen is received in a mailing cage. Describe the steps to be taken to ensure successful introduction into a large aggressive colony of honey bees.
c) List in tabular form the similarities and differences between a drone laying queen and a laying worker.

Q7. a) Name the organisms currently notifiable under the Bees Act.
b) Describe the signs of EFB and name the organism. Use the following headings:-
time of death, brood pattern, unsealed brood, sealed brood, cappings, scales, smell.
c) What action should be taken by the beekeeper if EFB is suspected in a colony of honey bees?
d) What is the current legal treatment in England and Wales?

b)

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Paper B: Scientific.

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1. It is popularly believed that the "Isle of Wight"' disease which affected honey bee colonies in Britain prior to the Great War was caused by the parasite *Acarapis woodi*. This view is controversial.
a) Describe the "outbreak" of the disease, its alleged symptoms, the effects on colonies and the discovery of *A. woodi.*
b) Discuss an alternative explanation for the "disease", describing any experiments carried out to determine its cause.

2 During 2001, in Devon, a population of *Varroa destructor* mites, resistant to tau-flauvalinate, the active ingredient of Apistan was discovered. Discuss the implications of this discovery
List the options available or future possibilities, to overcome this problem.

3 It is thought the bumble bee *Bombus subterraneus* is now extinct in Britain, and many other species of bee are thought to be endangered. Describe the habitat changes which have occurred during the 20th century and the effect they may have had on bee populations.

4 You are an analyst, and are given two jars of honey claiming on their label to be English. It is however, suspected that one is in fact Australian honey fraudulently labelled.
a) Describe the procedures you would use to distinguish between them.
b) Describe with illustrations, some common pollen types expected to be characteristic of English and Australian honey.

5. Describe a simple system of queen rearing and outline the biological principles which need to be taken into account in order to produce high quality mated queens.

6 Define the terms: pheromone; allomome; kairomone. Describe four honey bee pheromones, including the glands which produce them, their principal components, and their effect on individual bees and the colony.

7. a) Distinguish between the terms pollination and fertilisation within plant species.
b) Compare and contrast the process of pollination within the Compositae and Fabaceae (Leguminoseae) families.