

**EXAMINATION BOARD FOR THE NATIONAL DIPLOMA IN BEEKEEPING & THE
UNITED KINGDOM CERTIFICATE IN BEEKEEPING.**

JUNE, 1984.

PAPER 'A'.

Time allowed - 3 hours.

Instructions for candidates:-

ANSWER FOUR QUESTIONS ONLY.

All questions carry equal marks.

Marks will be deducted for irrelevancy and for faulty English.

Marks will be awarded for clear diagrams where relevant.

1. Explain in detail how you would establish a commercial queen rearing business. Your account should include a description of:-
 - a) The method of queen raising you would use, and
 - b) The genetic and other factors to be considered for the production and marketing of high quality queens.
2.
 - a) Give an account of the causes of swarming in honey bees. Your account should include details of the work carried out at the Rothamsted Experimental Station.
 - b) Describe how swarming can be effectively controlled in a commercial beekeeping enterprise of 400 colonies.
3.
 - a) Give a detailed account of the equipment required and the methods used to harvest honey on a commercial scale to produce a high quality product for sale in bulk to a honey packer. Your account should commence when the crop is ready for removal from the hives.
 - b) Discuss the value of a cooperative extraction plant.
4. Describe, with the aid of diagrams:-
 - a) The component parts of a typical high power compound microscope.
 - b) How such a compound microscope, without an integral light source, should be set up for the identification of *Nosema* disease.
5. Give an account of the main changes in agricultural practices in the United Kingdom since the Second World War, and the effects these changes have had upon beekeeping.
6.
 - a) Give a full account of the importance of pollen to the honey bee colony. Your account should include a description of the effects on the colony of pollen shortages.
 - b) Describe those situations in which early protein feeding of honey bee colonies may be essential, and how colonies may be provided with protein nutrients in an area which has limited and spasmodic supplies of natural pollen.
7.
 - a) List the factors which should be incorporated into a Code of Practice to be observed by fruit growers and beekeepers in relation to the supply of honey bee colonies for pollination purposes.
 - b) Describe the actions that can be taken to minimise damage to colonies (other than moving the bees) when advice is received that the spraying of insecticide is to be carried out at short notice on a crop that honey bees are working.

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ANSWER FOUR QUESTIONS ONLY.

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1.
 - a) Define the term "virus".
 - b) Describe the fundamental characteristics of viruses and how they differ from other disease causing agents.
 - c) List the virus diseases of honey bees that occur in the United Kingdom.
 - d) Describe fully the signs and symptoms of sacbrood disease and how the causative agent multiplies and spreads.
2. Define the term "pheromone" and write an essay on the discoveries so far made on the use of pheromones by the honey bee colony.
3.
 - a) Define briefly FIVE of the following terms: symbiosis; polarisation; meiosis; heterosis; mutation; ecdysis; oogenesis.
 - b) Write an expanded definition of the remaining two terms.
4. From a physical viewpoint, extracted honey is an aqueous dispersal of materials covering a wide range of particle size. Discuss the physical characteristics of honey in the light of this statement.
5. Give a detailed account of bee venom. Your account should include: its chemical constituents; allergic reactions to venom and treatments for such reactions; the methods employed in the collection of venom; and possible uses of venom in the field of medicine.
6.
 - a) Describe the Dzierzon theory of parthenogenesis in honey bees.
 - b) Outline a method of demonstrating the theory and, with the use of diagrams, show that honey bees in this country could gradually revert to the black type.
7. Write an essay explaining the difficulties which may be encountered for genetic reasons in breeding honey bees.