THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874 Registered Charity No. 212025

EXAMINATION FOR PROFICIENCY IN APICULTURE
MODULE 5 HONEYBEE BIOLOGY

Candidate Number:

19th March 2016 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 and 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 Which two glands produce brood food? ……...

Q2 Where are sperm stored in the drone? ……

Q3 Name the tough wall surrounding the egg. ……..

Q4 What type of haemocyte engulfs foreign bodies? ……..……..

Q5 Name the hard substance which gives the cuticle of the bee its dark colour. ……

Q6 Name one constituent of Nasonov pheromone. ……

Q7 Which section of the hind leg of the worker honey bee carries the corbicula? ……

Q8 Name the photopigment in the ommatidium. ……..

Q9 Which type of sense organ detects smell? ……..

Q10 Name the enzyme which breaks down starch. ……

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) Briefly compare the structure of the digestive systems of the honey bee larva and the adult worker. 9

(b) Account for the differences in the two systems. 6

Q12 Describe how the structure of the thorax and the various muscles inside it enable the honeybee to fly. 15

Q13 Describe simply the functioning of the fat body in the larva, pupa and adult worker honeybee. 15

Q14 Briefly describe the central nervous system of the adult honeybee including its constituent parts and their basic structure. (Histological detail is not required.) 15

Q15 Write a brief account of juvenile hormone including its functions in the larva and adult honeybee. 15

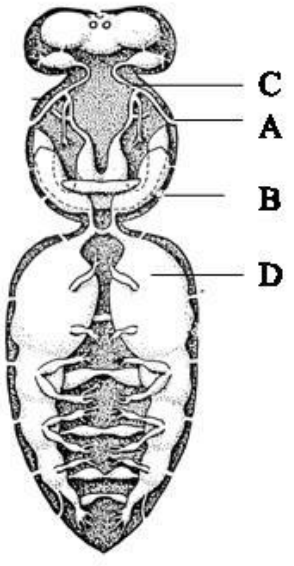
SECTION C (30 marks)

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

Q16 (a) Define excretion. 3

(b) Describe, with the help of a simple, fully labelled diagram, the structure and function of a Malpighian tubule, including its relationship to other structures involved in the excretory process. 27

Q17 (a) Identify the parts A to D shown on the diagram and describe the structure of each. 15



(b) Describe in detail how oxygen reaches the internal organs of the bee when the insect is at rest and explain the changes that take place when the bee is flying. 15