

THE BRITISH BEEKEEPERS' ASSOCIATION

Founded in 1874

Registered Charity No. 212025

EXAMINATION FOR PROFICIENCY IN APICULTURE

MODULE 3 HONEYBEE DISEASES, PESTS AND POISONING

21st March 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 scientific name of the causative organism of American Foul Brood.
- Q2 What is the recommended sample size needed for diagnosis of Nosema in worker.
- Q3 Name the organ in the honeybee that can be attacked by *Acarapis woodi*.
- Q4 Name the Statutory Order that relates to Tropilaelaps.
- Q5 Give the scientific name of the Asian Hornet.
- Q6 What is the common name for *Achroia grisella*?
- Q7 What is the maximum height of a slot when used as a mouse guard for winter?
- Q8 Name one distinguishing anatomical feature of the adult small hive beetle.
- Q9 At what stage does *Melissococcus plutonius* normally kill a honeybee?
- Q10 Hard white, black or grey "pellets" are found on the hive floor. What is this a sign of?

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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 If *Aethina tumida* was suspected in your apiary explain,
- (a) What device should be used to detect the adult? 1
 - (b) How can *Aethina tumida* be identified? 4
 - (c) What actions should be taken by the beekeeper? 5
 - (d) What could be the consequences to the beekeeper if it was discovered? 5
- Q12
- (a) Label A, B, C, D on the diagram provided. 4
 - (b) Indicate on the diagram where any disease forming organisms might be found, giving the name of the organ and the relevant disease. 4
 - (c) Give details of how these organisms would affect the worker honeybee. 4
 - (d) How are these diseases transmitted and what is the agent of transmission? 3
- Q13
- (a) With the aid of a table list the differences between *Varroa destructor* and *Braula coeca*. 3
 - (b) Why might beekeepers consider *Braula coeca* to be a pest in honeybee colonies? 1
 - (c) Describe the appearance of healthy sealed and unsealed brood. 6
 - (d) How would this appearance change if there were signs of parasitic mite syndrome. 5
- Q14
- (a) What are the statutory requirements relating to the importation of honeybees into the UK from States of the European Union? 12
 - (b) Name a non EU countries from which bees can be imported to the UK. 1
 - (c) Where a beekeeper receives a consignment of queen honey bees from a non EU country, name two actions which must be taken by the consignee. 2
- Q15
- (a) What are the signs of American Foul Brood? 5
 - (b) Why is AFB considered a notifiable disease? 1
 - (c) What is the treatment or management for AFB in the UK? 2
 - (d) EFB is also a notifiable disease. List the signs and how this disease can be confirmed in the field. 8

SECTION C (30 marks)

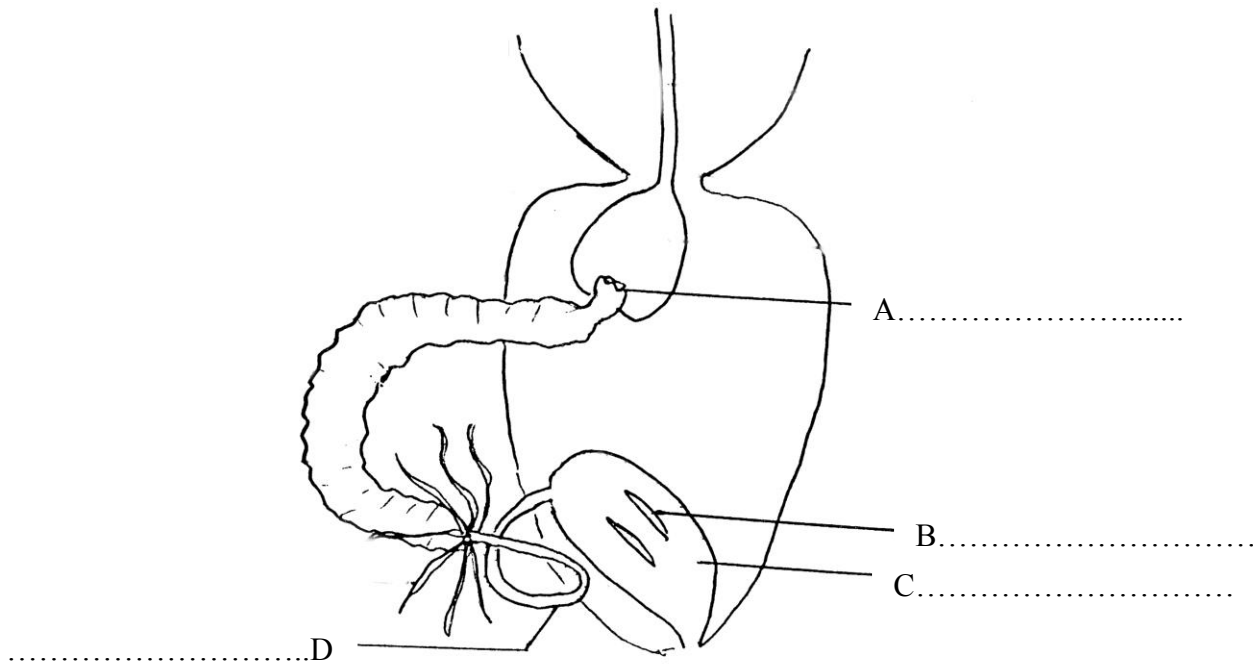
Answer **ONE** question from this section. Give *labelled* diagrams where applicable.

- Q16 Deformed wing virus and chronic bee paralysis virus can affect the honeybee colony. Discuss the effect of these two viruses. Use the following headings for each of the viruses: the age at which the bee is affected, the clinical signs, the effect on the colony, the methods of transmission and the remedial actions which can be taken by the beekeeper to minimise the effects of these viruses. 30
- Q17
- (a) Varroosis has spread quickly through the UK. Explain the reasons for this spread, how the population of the mite increases in the colony, why regular monitoring is necessary before and after treatment, and the problems caused by continued use of one acaricide. 20
 - (b) Other than queen trapping, describe two non chemical methods for managing a colony to reduce the level of Varroa in the colony 10

MODULE 3 HONEYBEE DISEASES, PESTS AND POISONING

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- Q12 (a) Label A, B, C, D on the diagram below. 4
- (b) Indicate on the diagram where any disease forming organisms might be found, giving the name of the organ and the relevant disease. 4
- (c) Give details of how these organisms would affect the worker honeybee. 4
- (d) How are these diseases transmitted and what is the agent of transmission? 3



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EXAMINATION FOR PROFICIENCY IN APICULTURE

MODULE 3 HONEYBEE DISEASES, PESTS AND POISONING

Candidate Number:

14th November 2015 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.

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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 What is the maximum recommended size for a hole in a mouse guard?
- Q2 What is the scientific name for the lesser wax moth?
- Q3 Give one organic acid authorised by the Veterinary Medicines Regulations 2013, for the treatment of Varroa in the UK
- Q4 Which organ is affected by amoeba?
- Q5 Which pest is associated with bald brood?
- Q6 What legislation covers the importation of honey bees into the UK?
- Q7 Give one immediate measure is to be taken if European Foul Brood or American Foul brood is suspected.
- Q8 With which pathogen might pesticide poisoning be confused, from the appearance at the hive entrance?
- Q9 What is the Beltsville test for?
- Q10 Give the scientific name for the causative organism of acarine.

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14th November 2015

SECTION B (60 marks, 15 for each question)

Answer any **FOUR** questions from this section. Write short notes for your answers.

Marks

- Q11 (a) Other than Chronic Bee Paralysis Virus list 4 viruses which may affect honey bees. 4
(b) List the signs caused by any 3 of these viruses, indicating any associated disease or pest where relevant. 9
(c) What measures can the beekeeper take to reduce the incidence and impact of viral diseases in the colony? 2
- Q12 (a) Why is regular brood comb change important? 3
(b) Give the scientific name for chalk brood and identify what organism it is. 2
(c) How does chalk brood affect a honeybee larva, and how is it spread within the colony? 5
(d) List the measures which the beekeeper can take to reduce the incidence of chalk brood. 5
- Q13 (a) Give the scientific names of the causative organisms of notifiable diseases and the pests in the UK. 4
(b) List the physical characteristics of:
i) the larval forms of the small hive beetle (SHB); 3
ii) the adult forms of the SHB. 3
(c) Where does the pupation stage of the SHB take place? 1
(d) List 4 possible ways in which the SHB is likely to enter the UK? 4
- Q14 (a) Notification has been given that pesticide spraying will take place near an apiary within the next 48 hours. What measures could be taken to reduce the risk of harm to the bees? 4
(b) List four signs that would be seen if the bees had been affected by pesticide poisoning? 4
(c) What measures should be taken in the event of suspected poisoning? 6
(d) With which virus infection might pesticide poisoning be confused from the appearance at the hive entrance? 1
- Q15 (a) Make a table comparing and contrasting the signs of EFB and AFB as seen on a frame of brood. 10
(b) What is the significance of a spore producing bacterium? 1
(c) List 4 possible ways in which these diseases might be transmitted between apiaries. 4

SECTION C (30 marks)

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

- Q16 (a) What would arouse suspicions that a colony might be infected with Nosema? 5
(b) Outline the lifecycle of Nosema indicating in your answer how it is transmitted within the colony and the effects on the individual bee and the colony. 13
(c) Describe in detail the management of a weak colony with a heavy infection of Nosema. 12
- Q17 (a) What is meant by the term Integrated Varroa Management (IVM)? 4
(b) Excluding the artificial swarm method list 7 approved techniques/methods and the months in which they are most appropriately used in implementing IVM in the UK. 14
(c) Describe in detail how to utilise the artificial swarm method for Varroa control. 12

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MODULE 3 HONEYBEE DISEASES, PESTS AND POISONING

19th March 2016 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 and 30 minutes on Section C.

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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 Name the causative organism of stone brood.
- Q2 What do the initials BQCV stand for?
- Q3 Name the approved oxalic acid treatment.
- Q4 What is the common name of *Aethina tumida*?
- Q5 Where would a beekeeper find Small Hive Beetle pupa?
- Q6 What piece of equipment is necessary for the diagnosis of *Acarine*?
- Q7 Which pest or disease is notifiable in the UK but not generally in the EU?
- Q8 What action should be taken on warning of pesticide spraying close to an apiary?
- Q9 What magnification is used to look at *Nosema sp.* Spores?
- Q10 Where in a bee might amoeba be found?

PLEASE HAND IN THIS SHEET AT THE END OF THE EXAMINATION

MODULE 3 HONEYBEE DISEASES, PESTS AND POISONING

19th March 2016

SECTION B (60 marks, 15 for each question)

Answer any **FOUR** questions from this section. **Write short notes for your answers.**

Marks

- Q11 Describe the actions of a bee inspector in an apiary, after diagnosing AFB. 15
- Q12 Some diseases leave scales within brood cells. Identify these diseases and the action to be taken in each case. 15
- Q13 Describe in a step by step manner how a shook swarm is carried out when a mild case of EFB is discovered. 15
- Q14 (a) Briefly describe methods of storing combs for winter. 3
(b) Give methods for treating diseases and pests in stored comb stating the pest or disease as well as the method. 12
- Q15 (a) Varroa has become resistant to treatments with hard chemicals:
(i) Name 3 hard chemicals(product names) which have been commonly used; 3
(ii) How has beekeeper use of the chemicals contributed to this resistance? 2
(iii) How can the resistance be measured? 1
(b) List the bio-technical treatments to which varroa cannot become resistant. 5
(c) State the limitations of 4 approved varroa treatments. 4

SECTION C (30 marks)

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

- Q16 There are several winged pests, current and potential, for honey bee colonies. Name six and **in each case** describe how to recognise, the effect they have on the colony and measures that can be taken to minimise the problems. 30
- Q17 (a) Compare the signs of poisoning and CBPV. 7
(b) Describe the actions that should be taken by the beekeeper in each case. 14
(c) What is the normal follow up action in a reported case of poisoning? 9

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EXAMINATION FOR PROFICIENCY IN APICULTURE

MODULE 3 HONEYBEE DISEASES, PESTS AND POISONING

Candidate Number:

12th November 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.

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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 How is American Foul Brood positively diagnosed in the field?
- Q2 Name an insect which steals food from the honeybee.
- Q3 Give the scientific name of a fungus causing a brood disease.
- Q4 Who should the grower contact if using a poisonous substance to spray a crop?
- Q5 Single cells or patches of brood with uncapped brood cells can be a sign of
- Q6 Name a pest that could be an issue in the honeybee colony during autumn and winter.
- Q7 Give one action a beekeeper can take when advised of crops being sprayed.
- Q8 What is the recommended number of bees used to make a diagnosis of nosema?
- Q9 Which disease is associated with Black Queen Cell Virus?
- Q10 Why are Apistan and Bayverol no longer widely utilized for Varroa treatment?

PLEASE HAND IN THIS SHEET AT THE END OF THE EXAMINATION

MODULE 3 HONEYBEE DISEASES, PESTS AND POISONING

12th November 2016

SECTION B (60 marks, 15 for each question)

Answer any **FOUR** questions from this section. Write short notes for your answers.

Marks

- | | | | |
|-----|-----|--|----|
| Q11 | (a) | Fill in the empty spaces in the table provided. | 10 |
| | (b) | What effect does Nosema have on the individual bee? | 5 |
| Q12 | (a) | State how to recognise the features and signs of the small hive beetle in the egg and larval stage of its life cycle in and around a bee hive. | 10 |
| | (b) | Describe the features of the adult small hive beetle. | 5 |
| Q13 | (a) | List 5 safety steps when using ethanoic (acetic) acid for fumigating combs. | 5 |
| | (b) | Describe briefly a method for fumigation of brood comb. | 8 |
| | (c) | What are the benefits of using ethanoic (acetic) acid in beekeeping? | 2 |
| Q14 | (a) | Give a brief description of the life cycle of the greater wax moth. | 10 |
| | (b) | How would wax moth within a colony be identified during an inspection? | 5 |
| Q15 | (a) | How would a beekeeper recognise chalk brood? | 6 |
| | (b) | How does this differ from stone brood? | 2 |
| | (c) | What factors are known to increase the chances of the presence of chalk brood? | 4 |
| | (d) | What action can a beekeeper take to reduce chalk brood in a hive? | 3 |

SECTION C (30 marks)

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

- | | | | |
|------|-----|---|----|
| Q16 | (a) | Describe in detail the development of European Foul brood in a honeybee. Include the name of the causative organism. | 16 |
| | (b) | Describe in detail the signs of EFB in a colony of honeybees. | 9 |
| | (c) | Under what circumstances is EFB most likely to be visible to the beekeeper? | 5 |
| Q 17 | (a) | Describe, in detail, the life cycle of <i>Varroa destructor</i> . Include ways this pest moves from one colony to another without human intervention. | 16 |
| | (b) | Describe the artificial swarm and shook swarm methods of reducing mite numbers. | 14 |

MODULE 3 HONEYBEE DISEASES, PESTS AND POISONING

12th November 2016

11 (a) Fill in the empty spaces in the table below.

10

	ACARINE	AMOEBA
Scientific name		
Specific place enters honey bee		
Age of honey bee when infestation occurs		
Specific location where disease multiplies		
How is the diagnosis made		

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EXAMINATION FOR PROFICIENCY IN APICULTURE

MODULE 3 HONEYBEE DISEASES, PESTS AND POISONING

Candidate Number:

18th March 2017 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.

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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 scientific name for chalk brood.
- Q2 Is the product "Hive Clean" approved by the Veterinary Medicines Directorate in the UK?
- Q3 Where does the male varroa mite die?
- Q4 Give one difference between Braula and Varroa.
- Q5 At what stage of brood development are the clinical signs of *Paenibacillus larvae*?
- Q6 What disease is associated with Nosema in queen rearing enterprises?
- Q7 Where in the UK has the insect *Aethina tumida* been reported?
- Q8 *Malpighamoeba mellifica* affects which part of the honeybee?
- Q9 Give the name and date of the main legislation, used in the UK, which covers honey bee notifiable diseases and pests.
- Q10 What paperwork must accompany a consignment of queens when imported from an EU country?

MODULE 3 HONEYBEE DISEASES, PESTS AND POISONING

18th March 2017

SECTION B (60 marks, 15 for each question)

Answer any **FOUR** questions from this section. Write short notes for your answers.

Marks

- Q11 In the spring there is a colony covering 4 national brood frames which is failing to build up, the queen appears fine and there are plenty of pollen and honey stores. There is some brown staining on the brood frames, but there are no other visible signs of an adult or larval bee disease.
- (a) What disease do you suspect may be affecting the colony? 1
 - (b) What test would you carry out to confirm the suspicions? 2
 - (c) Assuming the diagnosis is positive, what action should be taken by the bee keeper to bring the colony back to health. 12
- Q12
- (a) Give both the common and scientific name of a fungal infection that can frequently affect honeybee larva. 2
 - (b) How long are these fungal spores viable and what is an effective way of killing them on drawn brood comb, so it can be safely reused? 2
 - (c) Outline how 2 brood boxes of old drawn comb would be sterilised using acetic acid. List all the safety precautions that have to be taken during and after treatment. 11
- Q13 Two diseases can be identified in the field using Lateral Flow Devices (LFD).
- (a) List two important factors for the correct use of an LFD, assuming the use by date of the device is valid. 2
 - (b) For both of these diseases give the signs the beekeeper should be looking for when inspecting a colony for disease. 13
- Q14
- (a) List the common names and physical characteristics of the adult forms for both *Aethina tumida* and *Vespa velutina*, include dimensions. 10
 - (b) Create a table to list the differences in the physical characteristics between the mature larva of *Galleria mellonella* and *Aethina tumida*. 5
- Q15
- (a) Name two of the countries, outside the EU, from which it is legal to import queens. 2
 - (b) Outline the process that must be followed when importing queen honey bees from these countries. 13

SECTION C (30 marks)

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

- Q16
- (a) List the product names of 5 varroacides currently approved in the UK by the Veterinary Medicine Directorate and, for each, give the active ingredient. 10
 - (b) Give a detailed description of the lifecycle of the varroa mite. Give approximate duration, in hours or days, for each stage. Use diagrams if that will help the clarity of the answer. 20
- Q17
- (a) What are the visual signs when a honey bee colony is suffering from chronic bee paralysis virus (CBPV)? 8
 - (b) Name two other conditions that could be confused with CBPV. 2
 - (c) Give a detailed account of the procedure for a shook swarm. 16
 - (d) List two additional factors that ensure this procedure is successful. 2
 - (e) Other than as a treatment for EFB, name two other conditions where a shook swarm may be an effective remedy. 2

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EXAMINATION FOR PROFICIENCY IN APICULTURE

MODULE 3 HONEY BEE DISEASES, PESTS AND POISONING

11th November 2017 Time Allowed 1½ hours

Candidate Number:

Instructions to Candidates

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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 Name the test kits that Appointed Bee Inspectors use to confirm AFB and EFB in the field.
- Q2 What is the scientific name for small hive beetle?
- Q3 If EFB or AFB is suspected in a colony what should be done to the hive entrance?
- Q4 Name the mite species that is notifiable in Europe.
- Q5 Where does the Acarine mite enter the honey bee?
- Q6 Where in the honey bee may Amoeba be found?
- Q7 Name a product that can be used to fumigate comb and kill *Nosema spp.* spores.
- Q8 Name two brood diseases or conditions that can cause larvae to turn a bluish black colour?
- Q9 Where on the honey bee does *Braula coeca* go to feed?
- Q10 Name a virus associated with *Nosema spp.*

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MODULE 3 HONEY BEE DISEASES, PESTS AND POISONING

11th November 2017

SECTION B (60 marks, 15 for each question)

Answer any **FOUR** questions from this section. Write short notes for your answers.

Marks

- Q11 (a) List the diagnostic features of *Vespa velutina nigrothorax*. 6
(b) State where the nests of *sp.* might be found. 3
(c) If *V. velutina* is found in an apiary, what actions should the beekeeper take? 6
- Q12 Shook swarm and Bailey Comb change are techniques that can be used when managing a honey bee colony. List five circumstances which would merit the use of each procedure and why each is the most appropriate in that situation. (Explanation of how to perform these manipulations is not required) 15
- Q13 (a) Give the Latin names of the organisms of the two notifiable diseases as defined in The Bee Diseases and Pests Control (England) Order 2006 (SI 2006 No 342) or UK equivalent. 2
(b) List the main signs for each disease. 13
- Q14 (a) Compare the signs of poisoning with Chronic Bee Paralysis Virus (CBPV). 9
(b) What actions should be taken in the case of CBPV? 6
- Q15 (a) To what legislation does a beekeeper need to conform if they wish to import honey bees from an EU member state? 3
(b) What are the requirements for a Health Certificate to be issued? 10
(c) Other than an EU member state, from which country can honey bee packages be imported? 1
(d) Where is the up to date information on import and export requirements published? 1

SECTION C (30 marks)

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

- Q16 (a) List the signs that a beekeeper may see in a colony of honey bees towards the end of the summer which may indicate that the varroa mites are be reaching a critical level. 7
(b) List the current varroa treatments approved by the VMD in the UK and their active ingredients. 8
(c) In mid-July a colony with 20 frames of bees, of which 10 frames are brood, which is headed by the current years queen, needs to be treated for varroa so that it is ready for a honey flow in first week in August. Which chemical treatment from the list above would be the most appropriate and why? 5
(d) How would a beekeeper perform a shook swarm on a colony in mid-summer specifically to maximise the reduction in varroa levels without using chemicals 10
- Q17 List the signs that a beekeeper may use to identity an infestation of small hive beetles inside and outside of a honey bee colony. 30