

Supporting the Further Formal Beekeeping Education of RBKA Members

The whole purpose of this particular exercise is to encourage & support more RBKA members to sit the BBKA theory modules. Just as important as knowledge of beekeeping theory, is exam technique. Most of us haven't sat a written exam in a long time when we embark on the modules. The Basic assessment is an enabling assessment, where the Assessors are expected to repeatedly rephrase a question if necessary, until they are sure that they have got all that the candidate knows about the answer out of them. The theory modules are completely different. They are exams. Time is very limited, but long enough that hands unused to writing for long periods become very tired indeed.

The lowest pass rates for the modules are always for modules 1 & 5. Module 1 is almost always the 1st one people take. The misconception being that it'll be like the Basic, just in a bit more depth. Like all the modules, it is a tough exam. You need to be on top of exam technique as well as the syllabus. I always advise people to practice answering past papers under exam conditions. It's great practice at writing for 90 minutes solid and will show not just what you know & don't know about syllabus points, but even more importantly just how easily you can succinctly write down an explanation as your answer. Practice at honing down your explanations to the key critical points is important. Module 5 has a low pass rate because it is by far the largest syllabus and being Honeybee Anatomy is a subject that most people have not studied before. Biology has long been an increasingly rare subject studied in any depth even in compulsory education. Lots of the module 5 syllabus has to be learnt by rote and many of us are not adept at that either.

So, I've made a start with this past paper. Hopefully, I'll be able to encourage other members who have already successfully passed a module, to submit similar sample answers to past papers in the future. I've answered the questions under exam conditions in the time allowed and then later typed them up, to make them readable and get them onto the website. My handwriting at the end of 90 minutes solid writing under exam pressure is truly atrocious! I use a black gel pen, not a biro, to take a bit of strain off my arthritic hand.

I had 5 mins. left at the end to read through my paper and make a few additions & corrections. Everything in [square brackets] was added whilst typing up my exam answers and is added to explain why I chose to answer the questions I did, or as in Q.13, to acknowledge other possible answers. There may be additional points that could be written down for other Section B questions, but it's very important to note that I've stopped and moved on when I thought I'd written enough in order to get the maximum number of marks available; i.e. if only 6 marks for answer, don't waste time trying to come up with 10 points to write down – see Q.13 b & d. It's very important to answer each question on a new sheet/side of paper, so that you can easily add things later on.

I'm not altogether happy with my answer to Q.17 b, not sure there's enough for 19 marks. However, that's all the time I had available, if I wanted 5 minutes to go back over all my answers. If you run short of time whilst on Section C, forget writing in essay style and just put bullet points. That way you'll end up gaining more marks.

My answers have not been marked by a BBKA marker. Any & all errors are entirely my own. The point is not so much to provide you with correct & full answers to the questions, as to show the way they expect you to fully answer a paper within the very short time allowed.

One last point, I've made sure to mention hygiene and hygienic practices frequently in my answers. The BBKA Exam Board place great emphasis on this, so I've tried to "curry favour" to use an old expression.

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Module 1 Paper – 10 Nov 2018

Section A (10 marks, 1 for each question)

1. Give a simple method for confirming queenlessness
Test frame of eggs & less than 3 day old larvae
2. Name a hive that uses British Standard frames with short lugs in the brood box
Smith
3. What type of foundation is used for comb sections?
Thin unwired
4. What is the value of pollen to a colony?
Protein source
5. Give one way to prevent drifting of bees between hives
Orientate hive entrances in different directions
6. Name one method of uniting honey bees
Newspaper method
7. Name a hive which uses 10 frames in the brood box
WBC
8. What is a Rhombus used for?
Clearing supers
9. Using the international queen marking system, what will be the colour used to mark queens raised in 2019?
Green
10. What are the dimensions of bee space?
6-9mm

Section B (60 marks, 15 for each question)

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

- Q11. (a) How would a beekeeper manage colonies to take full advantage of:
(i) Autumn sown oil seed rape (OSR), and
(ii) Spring sown OSR? 12
- (b) What are the problems commonly associated with OSR? 3

[Not answered, as I think this is too much like a Section C question. Far too much to write in the time allottable to a Section B question and too many parts. The other B questions are much more straightforward and if not completed in time, can be easily added to at the end when reading through your answers.]

- Q12. List 15 things a beekeeper should perform or examine for during the first spring inspection of a honey bee colony. 15
1. Remove mouseguard
 2. Remove woodpecker cages
 3. Remove any trapped pests entombed in propolis
 4. Remove super from under brood box, if left on as winter feed
 5. Put onto clean floor
 6. Check for BIAS & thereby for presence of Q
 7. Check brood pattern – is Q laying normally?
 8. Check comb for signs of damp inside the hive. Do you need to replace roof or boxes? Is hive still weathertight?
 9. Insert varroa board
 10. Start chosen comb replacement method
 11. Check for signs of pests & diseases
 12. Check for stores – enough to last to next inspection without income?

13. Check for space – enough for: new stores; Q to lay in; & for whole colony overnight, inc. foragers?
14. Any signs of swarm preparation?
15. What local crops are in the ground? Think about stimulation feeding to take maximum advantage of autumn sown crops, such as OSR

Q13. (a) Describe how a beekeeper would recognise if a colony is being robbed? 5

- Apathetic bees in colony, not coordinated
- Aggravated bees making higher pitched buzz in colony
- Fighting on landing board
- Bees flying directly in from/to another hive in the apiary
- Stores being depleted at unexpected rate

(b) What actions can a beekeeper take to reduce robbing? 6

- Know why you're going into a hive & keep inspection short
- Keep supers covered whilst inspecting
- Don't feed newly created nuc's until all flying bees have returned home
- Don't feed until all bees have finished flying for the day
- Feed all colonies in an apiary, not just one or two
- Reduce entrances on colonies being fed

[other possible answers – not needed, as 6 written above & only 6 marks given for this Q.]

- Don't spill feed in the apiary
- Keep all hives bee tight
- Watch out for robbing & stop it as soon as it starts

(c) What are the dangers of robbing? 3

- Spread of pests & diseases
- Colonies ignore external nectar sources, just rob from within apiary = no increase overall
- Colony being robbed may dwindle & die

(d) Name one other species that may rob honey bee colonies 1

- Wasps

[other possible answers – not needed, as 1 written above & only 1 asked for!]

- [Hornets]
- [Ants]

14. (a) Why should beekeepers regularly replace comb within a hive 5

- Old brood comb retains some detritus that attracts wax moths
- Q will reject some cells of old brood comb to lay in, therefore, replacing comb increases space for her to lay in
- Holes in the comb get made by the bees to facilitate movement
- To remove viral load that's built up in the old comb
- Super combs store a food product for bees & humans, so shouldn't be used indefinitely

(b) How would a beekeeper perform a complete brood comb change in May on a strong colony with a brood chamber and two supers? The weather is good and the beekeeper wishes to keep the brood. 10

- Bailey Comb Change on a Strong Colony

[always worth putting down what method you're trying to explain. In this case it also reminded me not to wander off into explaining the version for a weak colony!]

- Find & cage the Q
- Close off hive entrance
- Remove frame the Q was on
- Place a Bailey Board or QX & eke with small entrance on top of the old brood box
- Place a clean brood box on top of the Bailey Board/QX & eke
- Place Q's frame in the top brood box
- Fill the rest of the box with either foundation or sterilised drawn comb
- Release Q onto her frame (alternatively, you can move her on the frame, making quite sure not to drop her)
- Place QX on top of new brood box
- Place the 2 supers on top of QX
- It's May, weather good and they have 2 supers, so presumably they have enough stores to use to draw out any foundation. Otherwise remove supers and feed, if giving them foundation to draw out
- Replace hive roof
- As soon as Q is laying on the new frames in the top box, move the old frame into the bottom brood box and replace with a new frame at the side of the new brood box (i.e. don't split the brood nest)
- When all brood emerged in bottom brood box, remove box & frames
- Remove Bailey Board/QX & eke
- Reassemble hive, having lowered the newer brood box onto the floor
- Sterilise all equipment coming off the hive and melt down the old frames
- As the colony is strong and there's no disease present, the old frames with just stores (nectar, honey &/or pollen) can be left in the old brood box for them to use/move the stores into the new brood frames. Otherwise, you may need to feed the colony; especially if they have foundation to draw out in the new brood box. Obviously, you can't feed if they have supers on or they would put syrup into the super frames
- Alternatively, you can remove all brood frames that don't have brood on them from the old brood box before placing anything on top of the old brood box. These could be placed in a freezer to sterilise them and then used to boost a weaker colony, so long as the frames are definitely disease free.

15. (a) Other than a plastic queen excluder, list 3 different types of queen excluder available to beekeepers. 3

1. Slotted
2. Wired, framed or unframed
3. Herzog

(b) What are the advantages & disadvantages of the plastic queen excluder? 7

Advantages

- Light & easy to carry
- Cheap

Disadvantages

- Sag in the middle sometimes
- Tend to get more propolised than wired ones
- Stick to top bars of frames
- Can't put in solar wax excluder
- Hard to clean

(c) List five situations or tasks that may use a queen excluder. 5

1. Keep Q out of supers

2. On top of supers during an inspection, to keep returning drones out of the supers
3. Below brood box to anchor a newly hived swarm in the box
4. Bailey comb change – to keep Q out of bottom box
5. Newspaper method - to hold down the newspaper when uniting

Section C (30 marks)

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

- Q16. (a) What is the difference between a cast swarm and a prime swarm? 2
- (b) What visual signs should a beekeeper look for to confirm that a colony is preparing to swarm? 6
- (c) List 10 swarm prevention techniques that can be employed by a beekeeper. 10
- (d) On examining a colony, a beekeeper found advanced unsealed queen cells. Describe, with the aid of diagrams, an artificial swarm method of swarm control. 12

[I would never recommend doing a question on artificial swarms in an exam. Under pressure, it's extremely hard to get all the stages right and fully down on paper. All the more so as they are asking for labelled diagrams. This question also has so many parts, it makes it very difficult to do in the allotted time. However, I appreciate that some people find this sort of question attractive, as they have a clearer indication of how much to write for each part of it.]

Q17. The beekeeper has his apiary in a large suburban garden. One of his colonies has become so vicious the beekeeper is unable to find the queen by normal inspection. Detail how the beekeeper should re-queen this colony using a bought in queen.

The answer should include:

- (a) managing the postal queen 5

Prepare Butler cage. Wrap newspaper around closed end and secure with elastic band, so as to give the Q room to get away from over-solicitous workers. Colony is vicious, so bees may be less accepting of a new Q than a calmer colony. Prepare candy to block the other end of the cage. Make sure the bees cannot escape closed room. Open Q transport/postal cage against a closed window. Bees will fly to window. Carefully & gently pick up Q by the wings using your right hand. Introduce Q to left forefinger, holding her legs with your left thumb & middle finger. Mark Q's abdomen with current year's colour and clip 2/3 of Q's right wings, if not already done by supplier.

Run Q into Butler cage and seal the other end with candy. The Q's supporters can be let out of the window. Set the cage aside ready for carefully taking it to the apiary. Remember to take a large matchstick or something else to suspend the cage between 2 brood frames. Some people claim Q more likely to be accepted if not clipped or marked. I first learnt about beekeeping from a skepist who had originally kept old British black bees. They were known to not accept a Q unless she was symmetrical. This family friend always clipped both wings and marked with watercolour paint that had no smell. Perhaps it's collective memory that remembers this trait of the black bees and falsely transfers this claim to our modern mongrel bees.

Tony Harris, Scottish Beemaster stated in his Mini-Mating Nuc's workshop at the 2018 Spring Convention that he never separates the Q from her supporters and has never had a Q rejected because of this. However, most books state that the supporters are likely to

become overprotective of the Q and fight with the workers in the colony. Thereby risking the Q getting injured. Hence, I've included the step of separating out the Q.

(b) finding & disposing of the vicious queen

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If other people or animals are exposed to the colony (e.g. neighbours, family, pets or livestock) first move the colony out of the garden to an isolated site over 3 miles away. Leave them a few days to establish themselves at the new site (i.e. reset their mental maps of the area around their hive).

Before the bees start flying for the day, move the whole hive several metres away. Place a couple of clean supers or a brood box on a floor with reduced entrance & without a colony on the original site. Put a roof on the supers/brood box. Flying bees will leave the colony and return to the original site. This will substantially reduce the number of bees in the original hive, making finding the Q much easier. The older flying bees are also likely to be the most vicious ones.

Margaret Thomas advocated cutting the hive and leaving the supers on the original site, just moving the brood box & QX away, in her article republished in the General Husbandry book published by BBKA. However, this means exposing the beekeepers to the whole vicious colony. I'd rather use a clean brood box or supers on the original site to catch the returning flying bees.

From late afternoon onwards, inspect the moved hive and first of all check that colony's viciousness isn't due to pests, disease, robbing or some other cause that doesn't require Q replacement. Don't spread problems in the apiary. If just genetic traits of drones the Q has mated with is causing the viciousness, proceed to requeen the colony.

Take a nuc out of the moved hive: 3 frames of brood, 1 frame of drawn comb (space for bought Q to start laying in), and 2 frames of stores at the side of the nuc. Obviously, make quite sure Q is not on one of the frames placed into the nuc. As brood frames are removed, the Q should be found and can then be caged. Shake enough housebees into the nuc to be able to look after the bought Q and the brood. Set a reduced entrance on the nuc and don't feed unless not enough stores available. If feeding required, wait until all flying bees have left the nuc. You don't want to cause robbing to start.

If Q not found whilst taking out a nuc, pair up remaining frames in the moved hive and then close up the hive. Leave for around 20 minutes to allow Q time to come up onto the space between two frames. Go back into the hive. Lift each pair of frames, quickly looking for the Q as you open the pair of frames 'like a book'. If still not found, smoke the bees through a QX to find her.

Return the moved hive to its original site. If supers used to catch returning flying bees, these can simply be added above the other supers on the returned hive. It's May and a strong colony, so the supers may be needed later on in the season. Alternatively, if they are not wanted on the hive after requeening, place a clearer board under them.

Q in vicious colony can either be left alive until bought Q has started laying in the nuc or disposed of now. If left alive, she is best banked in a mini-nuc, as this will only use a further cupful of workers from the moved colony. It will also mean that there are no further eggs laid in the moved colony that will produce vicious bees. On reuniting, the only eggs and young brood will be with the bought Q. This should help her be accepted, as they will be producing the strongest brood pheromone and be identifiable as coming from her. If the bought Q is rejected or the process fails in any way, the banked vicious Q can be reunited

with the colony whilst awaiting a new bought Q to arrive and starting again, or an emergency Q cell can be left whilst awaiting a new bought Q.

Ideally, the old Q should be removed alive and offered within the local beekeeping association. There are always other beekeepers looking for a Q to practice their dissection and anatomy slide making skills on. Even a vicious Q has value.

(c) introducing the new queen

6

Hang Butler cage between 2 brood frames in the nuc, i.e. where the workers would most expect to find a Q.

Leave nuc alone for 3 to 4 days. Then inspect nuc to check that Q has been released and started to lay eggs. If there are eggs, they must be from the new Q. If no eggs, close up and reinspect a few days later.

When Q in lay, move nuc into a full-sized brood box and reunite with colony on the original site using the newspaper method. Obviously, remove all emergency queen cells from the original brood box before uniting. Place the new Q & brood box above the old brood box. This will mean that the vicious bees will not have contact with the new Q until her pheromones & the brood pheromone have permeated the whole hive. When successfully united, sort out the hive removing any unneeded brood frames, boxes & QX. Sterilise everything coming off the hive.

If bought Q fails to come into lay or is killed by the workers, the colony can be reunited with the banked Q or another bought/traded Q introduced into the nuc.

If successful and the vicious Q has been banked, she can now be passed on for microscopy, the bees in the mini-nuc shaken into the reunited colony and any brood in the mini-nuc put in the solar wax extractor. You don't want brood from the vicious Q to hatch into new vicious workers!