



The Scottish Beekeepers' Association

PREPARING FOR AND ANSWERING QUESTIONS IN THE MODULE EXAMS Jane Slight & Alan Riach - Jan2025

Biological terminology including notes on scientific naming:

- Learn these Latin derived words – dorsal [back-top side], ventral [underside], anterior - front, posterior-rear, distal- away from the centre
- And these prefixes - exo-, endo-, epi-, post-, pro-, [outside, inside, outer, after/behind, in front/before,]: practise these so you are sure you have the correct term
- -sis, -tion, -ism, – words with these endings are processes, something that happens [trophallaxis, digestion, pollination, manipulation, metabolism]
- And these suffixes - trachea [one breathing tube], tracheae [plural], tracheal [adjective], tracheole [little breathing tube], ocellus [one simple eye], ocelli [2 or more simple eyes],

Enzyme names – the first part of the name sometimes refers to the substrate (what the enzyme works on); the ending of the name, -ase (mostly), indicates that it is an enzyme. So the enzyme sucrase works on sucrose, but the enzyme catalase breaks down hydrogen peroxide.

NOTES ON THE SCIENTIFIC NAMES FOR LIVING THINGS

There is a formal system of naming living things which is important as it is used worldwide, like a universal language to avoid confusion when describing living things. The system often uses words based on apparent characteristics of the living thing, such as colour, shape. Many of the words are based on Latin words (as are many of our everyday words in English) and some are named after people.

The formal name, or biological name, for a living thing is always two words – the first is known as the genus name and the second is the species name. The genus starts with a capital letter, the species with a lower case letter, and both words should be in an italic font. However, if writing this name, you should underline the two words separately, so -

digital or printed – We humans, are known as *Homo sapiens* and we keep bees, *Apis mellifera*.

handwriting – We humans, are known as Homo sapiens and we keep bees, Apis mellifera.

In an article, if the biological name is used at the beginning, it is acceptable to subsequently abbreviate this biological name, by reducing the genus name to the initial letter and spelling the species name fully: so – *H. sapiens*, *A. mellifera*

If referring to several different species which all belong to one genus, write *Apis spp.*

Sometimes a species is subdivided into many subspecies, as happens with bees. They are written *Apis mellifera mellifera*. In this case the species name is *mellifera* and, confusingly, the subspecies name is also *mellifera*. In an article, once the subspecies name has been fully written, it is

accepted to abbreviate this subspecies name to Amm. Sometimes these subspecies are referred to as 'races', and the main ones we talk about are listed here:

| biological name | | common name |
|----------------------------------|------------------------|-----------------------------------|
| <i>Apis mellifera mellifera</i> | <i>A.m. mellifera</i> | Dark Western or European dark bee |
| <i>Apis mellifera ligustica</i> | <i>A.m. ligustica</i> | Italian bee |
| <i>Apis mellifera carnica</i> | <i>A.m. carnica</i> | Carniolan bee |
| <i>Apis mellifera caucasica</i> | <i>A.m. caucasica</i> | Caucasian bee |
| <i>Apis mellifera scutellata</i> | <i>A.m. scutellata</i> | Africanized bee |

A hybrid bee is a cross between two subspecies, such as Dark Western or European dark bee and Carniolan bee. The Buckfast bee is a hybrid.

Commonly encountered bees, pests and pathogens are listed here with their biological names.

| biological name | common name |
|------------------------------------------------------|------------------------------------|
| Bees | |
| <i>Apis mellifera</i> | Dark Western or European dark bee |
| <i>A. cerana</i> | Eastern honey bee |
| <i>A. dorsata</i> | Giant honey bee |
| <i>A. florea</i> | Little honey bee |
| Other Insects | |
| <i>Braula coeca</i> | Braula |
| <i>Galleria mellomella</i> | Greater wax moth |
| <i>Achroia grisella</i> | Lesser wax moth |
| <i>Aethina tumida</i> | Small hive beetle |
| <i>Vespula vulgaris</i> | Common wasp |
| <i>Vespa velutina nigrithorax</i> | Asian hornet |
| Mites | |
| <i>Varroa destructor</i> | Varroa |
| <i>Acarapis woodi</i> | Acarine, acarapisosis |
| <i>Tropilaelaps clareae</i> and <i>T. mercedesae</i> | known as <i>Tropilaelaps</i> mites |
| Protozoa | |

| | |
|---------------------------------------------------|----------------------------------|
| <i>Malpighamoeba mellificae</i> | known as Amoeba |
| Bacteria | |
| <i>Paenibacillus larvae</i> | American foulbrood |
| <i>Melisococcus plutonius</i> | European foulbrood |
| <i>Bacillus thuringiensis</i> | bacteria for control of Wax moth |
| Fungi | |
| <i>Ascophaera apis</i> | chalkbrood |
| <i>Aspergillus fumigatus, A. flavus, A. niger</i> | stonebrood |
| Microsporidian fungal pathogen | |
| <i>Nosema apis, N. cerana</i> | Nosema |

Wasps, including hornets and yellowjackets, make up an enormously diverse array of insects, with some 30,000 identified species.

Naming viruses is much simpler - Deformed wing virus (DWV), Black queen cell virus (BQCV), Sacbrood virus (SBV), Kashmir bee virus (KBV), Acute bee paralysis virus (ABPV), and Chronic bee paralysis virus (CBPV) are the most commonly recorded.

Naming plants broadly follows the same rules for the same reasons of universality. Beekeepers usually use common names, often localised ones and this is precise enough. The two main sources of our heather honey are ling heather, *Calluna vulgaris*, and bell heather, *Erica cinerea*. But, take care as sometimes there is more than one common name for the same plant – rosebay willowherb and fireweed (*Chamaenerion angustifolium*).

Revision before the exam:

Learn words, terms and definitions as best you can. Practise writing them out from memory. Make 'flashcards' – any young person attending school will tell you how to do this! Bribe said young person to test you! Investigate the Quizlet website, where you can make digital flashcards easily for free. <https://quizlet.com/en-gb>

For plant biology – try the BBC bitesize website, or get hold of a school biology textbook (charity bookshops are a good source of second hand textbooks).

<http://www.bbc.co.uk/education/guides/zs7thyc/revision/1>

Practise writing out the steps for a procedure, eg. Pagden method of swarm control. First copy the steps out and then make sure you can do them from memory. Try and put as much information into them. Then practise again!

Exam - time management: The exam is 100 minutes long – so aim to write enough for 1 mark every minute, on average.

- section A 10 single word answers, less than 10 min
- section B 60 marks 60 minutes
- section C 30 marks 30 minutes

Don't spend ages on a 3 point question when there are 10 point questions still to answer.

You need to have time to look over the whole paper before the end. Check for daft mistakes – everyone can make these.

Exam – answering the questions:

- Read the question.
- Answer the question.
- Stick to the question.

Look at the number of marks for each part of the question – write a fact or short statement for each mark AND another 1 (just in case one of the original ones doesn't get the mark).

- Pay attention to the **verb** in the question – ie. what is the question asking you to do?
 - describe – what is it like? what do you do? you will need to write a few sentences
 - describe the appearance of . . . – write about what it looks like, size, colour, distinguishing features
 - describe the effects of e.g. of a disease on the colony (note description of disease is NOT asked for in this case).
 - function – what job does it do?
 - list – bullet points, make a list, just a list
 - define – a learned definition, one sentence
 - outline – describe the basics, likely to be more than one sentence
- Give one difference – say what one difference is for **both**.
eg. give one difference between braula and varroa –
the correct answer is - braula has 6 legs and varroa has 8 legs.
Do not write - different number of legs, or - braula has 6 legs. These answers are too vague and incomplete and don't earn you the mark.
- Similarly, when describing a colour change, state both colours –
eg. the colour changes from black to white.
- Diagrams – you won't be asked to draw diagrams but to comment on labels on diagrams.
- Use the correct terms – eg. haemolymph vs. blood, adult bees emerge vs. hatch/born (eggs hatch), there are no baby bees - NO anthropomorphism! It is incorrect.
- Use common sense – if there is something you can't quite remember, look for clues throughout the paper, so leave a few minutes to look over your answers at the end, so that your memory might be jogged and you can fill in the gap.

Spelling:

Don't worry if you are unsure of the correct spelling of some words in the exam. Make an attempt to spell it how you would say it.

What not to say:

I don't have a microscope, so I have not caught a swarm, so . . .

Revision Methods

People have differing learning techniques. However, the following is a well-known revising system devised at Cornell University which may be worth a try.

Study Methods based on the Cornell Note Taking System

Mark out some A4 sheets as below

| Cue Column (5cm wide)-Questions or Cue words | Note Taking Column (13cm wide) |
|----------------------------------------------|--------------------------------|
| | |
| Summary (5cm deep) | |

1. Record: During the lecture, or reading study, use the **Note-Taking column** to record the lecture or summary of paras read using telegraphic (abbreviated) sentences.
2. Questions: As soon after class or reading) as possible, formulate questions based on the notes in the right-hand column and write the brief questions or just cue words in the LH **Cue Column**.
Writing questions helps to clarify meanings, reveal relationships, establish continuity, and strengthen memory. Also, the writing of questions sets up a perfect stage for exam studying later.
3. Recite: Cover the note-taking column with a sheet of paper. Then, looking at the questions or cue-words in the question and cue column only, say aloud, in your own words, the answers to the questions, facts, or ideas indicated by the cue-words. Slide the paper down to check that you were correct.
4. Reflect: Reflect on the material by asking yourself questions, for example: "What's the significance of these facts? What principle are they based on? How can I apply them? How do they fit in with what I already know? What's beyond them?"
5. Review: Spend at least ten minutes every week reviewing all your previous notes. If you do, you'll retain a great deal for current use, as well as, for the exam

After class, use the 5cm deep summary space at the bottom of each page to summarize the notes on that page.