

EAS Master Beekeeper Written Exam 2021

Short Answer: (3 points each)

1. Name two famous beekeepers, one living and one deceased. Please share their contribution to the science and art of beekeeping.

There are many answers to this question

2. Describe three symptoms or visual evidences that your colony is suffering from European Foulbrood.

Yellow, twisted, slow build up, non-ropey capped brood

3. Name and describe a reliable way to measure Varroa mite infestation in a colony? Please defend and support your answer from above?

No methods are really reliable but the Best answer-Alcohol wash

Other answers- sticky board, sugar shake CO2 knock down

The answer to the next part will depend on what answer you chose, but for Alcohol wash, this method is the best at dislodging mites and has become standardized

4. Who feeds the brood? How is brood food produced? (Be specific)

Nurse bees feed young larvae a mixture of secretions from the hypopharyngeal and mandibular glands. Hypopharyngeal gland secretions are typically high in protein

and sugars whereas mandibular gland secretions are high in fats and lipids. Nurse bees feed older larvae a mixture of unripe honey and pollen.

5. What is a mating sign? When and where would you see this?

The mating sign is the last drone's genitalia that mated with the queen still inserted into the returning, now mated queen

6. In the late winter -early spring describe signs that a colony needs emergency feed.

Light weight, if it is warm enough to peak in heads are in cells, when you take off the lid the bees are right at the top.

7. What are three reasons a colony would raise a new queen?

Emergency- the queen has died

Supersedure- the queen is failing

Swarming- Normal colony growth and reproduction at the colony level

8. How would you apply feed to your colonies to build them up for winter?

Many different answers here depending on where you live.

9. Name three morphological characteristics of drones that relate to their function/job.

Large eyes with more ommatidia
Larger antennae with more sensory receptors
Large thoracic box to contain larger flight muscles
Barrel shaped abdomen to house their large genitalia

10. If a colony dies explain why you should quickly remove it from the apiary?

Robbing and pathogen transmission
The arrival of secondary pests that will destroy drawn comb

11. Name two important spring blooming plants for honey bees and two important summer blooming plants for honey bees.

This will also vary depending on where you live, for the Mid-Atlantic in spring Tulip Poplar, Black Locust. Summer clover, asters, golden rod, anise hyssop

12. Why should you only pull frames of honey that are fully capped?

To ensure that the honey is ripe and that enough water has been evaporated so that the honey doesn't ferment. It is also best to check moisture content with a refractometer.

True and False: (1 point each)

1. SHB larvae pupate in the soil, therefore cold soil temperatures can significantly delay adult emergence. **T** or F
2. SHB populations can increase dramatically when a colony is fed pollen patties because the protein facilitates larval development. **T** or F
3. A high level of juvenile hormone in the presence of ecdysone will result in a molt from a larval stage to a pupal stage. T or **F**
4. *Apis dorsata* is a giant cavity nesting bee species. T or **F**
5. Honey bees have monochromatic vision. T or **F**
6. If a colony is starving feed it. **T** or F
7. If there is more than 32 g of glucose per 100 g of honey the honey will not crystallize. T or **F**
8. Drone antennae have a smaller surface area than worker bee antennae. T or **F**
9. The mandibles of the queen are used mainly for getting out of the queen cell. **T** or F

10. Maples provide an important early pollen source to start egg laying within the colony in the early spring – late winter. **T** or F

11. Bumble bees are a type of honey bee. T or **F**

12. All fertilized eggs become females. T or **F**

13. The best time to raise queens is during swarm season. **T** or F

Fill in the blanks: (1 point each)

1. When a worker bee stings she releases the pheromone Isopentyl Acetate from the tissue attached to the sting.
2. The reason systemic pesticides can be dangerous to bees is the active ingredient can be found in the plant's pollen and nectar.
3. *Ascospaera apis* is the species name for chalkbrood and it is a fungus not a virus.
4. The over insulation of colony during winter can be deadly due to moisture
5. To reduce drifting in my apiary I could make boxes different colors and/or space them.
6. To assess queen quality I would look at these two characteristics brood pattern and retinue.

7. The hive inspector went through my colonies and found American Foulbrood and told me I had to burn to control the spread.
8. The major chemical component of honey bee venom is called mellitin.
9. One difference between a toxic versus an allergic reaction to honey bee venom is number of stings.
10. The names of two pheromones that are used during the swarming process are 9-ODA and HDA.
11. If you find that your colony is queen less and have laying workers you should shake the colony and requeen.

Multiple choice: (2 points each)

1. Propolis does not
 - a. act as physical barrier against the elements
 - b. have anti-viral and bacterial properties
 - c. come only from drones and frass
 - d. coat the interior of a honey bee hive cavity
 - e. turn on immune genes involved in social immunity

2. Varroa mites negatively affect
 - a. Protein levels in the blood
 - b. Sperm production in drones
 - c. Beekeeper sanity
 - d. The fat body
 - e. All of the above

3. If you find adult dead bees with their heads deep into the cells they most likely died from
 - a. Over exposure
 - b. Pesticide exposure
 - c. Nosema
 - d. Starvation

- e. Dysentery
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- 4. The Demaree technique is
 - a. A method for making a split
 - b. A technique for melting wax
 - c. A technique for controlling swarming
 - d. An insemination technique
 - e. everything above except b

 - 5. To diagnose Nosema infection you would dissect the adult worker's
 - a. chemoreceptors
 - b. Ventriculus
 - c. corbicula
 - d. ommatidia
 - e. Johnston's organs

 - 6. The active ingredient in Apivar® is
 - a. Formic acid
 - b. Fluvalinate
 - c. Amitraz
 - d. Thymol
 - e. Fumagillin

 - 7. What could cause sunken caps and pinhole openings in fully capped worker brood?
 - a. Small Hive Beetles
 - b. American Foulbrood
 - c. ants
 - d. Phorid flies
 - e. answers a, b and c

 - 8. In the Northern part of the United States _____lbs. of honey is recommended for overwintering a colony
 - a. 60-90
 - b. 20-40
 - c. 30-60
 - d. 10-40
 - e. Answers b and c

 - 9. In order to prevent swarming one could
 - a. Cut queen cells
 - b. Add room/space to the colony
 - c. Split the colony

- d. Shake frames of bees into another colony
 - e. All except d
10. When a person gets stung by a bee they should
- a. Should run away quickly
 - b. Use smoke on the site of the sting to cover up and alarm pheromone
 - c. Suck out the venom
 - d. Gently scrape out the stinger with your finger nail
 - e. Answers b and d
 - f. Answers c and d
11. Signs of a laying worker include
- a. Presence of mostly drones
 - b. Lots of pollen
 - c. Multiple eggs in a cell
 - d. The absence of a queen
 - e. Answers a, b and c
 - f. Answers a, c and d
12. Honey darkens over time due to
- a. Temperature and proteins
 - b. Lipids and proteins
 - c. Temperature and light
 - d. Lipids and Light
 - e. The dark forces within

Essays: Pick two (8 points each)

1. What is the difference between a flower visitor and a pollinator? Why is this designation so important for our food security and agricultural sector?

2. While talking with a friend they expressed their frustration with so much media and funding attention spent on honey bees. They don't understand why we don't focus more attention on native pollinators and other bee species. How would you respond to them.

3. If someone asked you what natural beekeeping is what would you tell them? What types of management fall under this category of natural beekeeping? Do you consider yourself a natural beekeeper?

4. Honey bees communicate using complex chemicals called pheromones. Pheromones are chemicals that are released that affect the behavior and physiology of another individual of the same species. One important pheromone is Queen Mandibular Pheromone (QMP). How does QMP influence the behavior and physiology of each of these different members of the colony:

Drones:

House bees

Forager bees

How does the QMP influence colony level processes like swarming?

