EAS Master Beekeeper Written Exam 2018 KEY

Short Answer:

1. Name two trade journals, one USA and one from another country, each with a publication record of at least 75 years that are useful for beekeepers and still in print today.
   1. Bee Culture, American Beekeeping Journal

   2. Bee craft, Bee World, Journal of apicultural research, etc…

2. Name a minimum of four mite treatments that can legally be used when honey supers are on the hive?
   1. formic

   2. drone brood removal

   3. sugar dusting

   4. hopguard

3. Describe three differences in the symptoms AND another 3 in treatment efficacy for *N. apis* and *N. ceranae.*

N. apis- excessive winter excrement spotting on the outside of the hive

N. ceranae- no spotting

N. apis- fumagillin can be an effective

N. ceranae- fumagillin may actually exasperate the problem

N. apis- high spore count in winter – a winter disease

N. ceranae – spore counts can increase and decrease in warmer weather

4. Which hive pests are Entomopathogenic Nematodes used to control? And how are they applied to control this pest?

   Small Hive Beetle, *Aethina tumida*

   Soil drench to kill pupae in the soil beneath and around the colony

5. Describe a minimum of three ways that temperature and diet affect the development/survival and population dynamics of the small hive beetle?

1. Since SHB larvae pupate in soil, cold soil temperatures can significantly delay adult emergence.

2. Also in cold winter climates, SHB cannot survive outside the colony cluster, so they cannot reproduce.

3. In warm climates, they can reproduce almost all year long.

4. If a beekeeper is feeding pollen patties SHB beetle populations can increase dramatically because the protein facilitates larval development.

6. List three endocrine glands located in an adult honey bee worker head. What do they secrete and what is the function of the secretion?
   1. mandibular gland- brood food, mainly lipids, 2 hepatnone, moisten cells, cocoons

   2. hypopharyngeal gland- brood food, mainly proteins, moisten cells cocoons

   3. salivary gland- digestive enzymes for nectar conversion, oils

7. Name the two hormones involved in honey bee growth and development. How do they interact to control molting from larval instars to pupa to adult?

	Name	How they interact
1.	Ecdysone	when this is present the insect will molt
2.	Juvenille hormone	the level of this in the presence of ecdysone determines the growth and developmental stage of the insect

8. Diagram and describe the components of an ideal late fall cluster when the temperature drops below 40 degrees F.

A tight round cluster of about 6-8 seams of bees that's under a top box or located between two brood boxes with approximately 70-90 lbs. of capped honey

9. Give two reasons bumble bees and not honey bees are used to pollinate greenhouse tomatoes?

1. Tomatoes need buzz pollination and bumble bees can do that.
2. Bumble bees can fly at a lower temperature than honey bees and greenhouse planting start in the season where cold would be a problem for HBs. Also bumblebees don't get as confused in the UV light of a green house – they can see better. and not "fight" against the surface.

10. Name two reasons the Boardman feeder is considered a poor way to feed bees.

1. promotes robbing

2. outside of hive so does not work well in cold weather, small container needs to be filled often

True and False:

1. *Apis florea* has a unique dance behavior. They dance on the horizontal surface at the top of the comb. T F

2. Beeswax is secreted by all adult worker bees during comb building. T F

3. Several metals such as iron, brass, zinc and copper will discolor beeswax and should be avoided during rendering. T F

4. When a colony expands and the brood and adult populations increase, a reduction of QMP occurs within the colony leading to preparations for requeening. T F

5. A benefit of purchasing a nuc colony as a means of starting a new colony, is that you are purchasing an already established, laying queen that should build up faster than a package of bees. T F

6. If a colony becomes noisy, flighty or starts hitting your veil you should work faster until you are finished going through each frame in the colony. T F

7. Robbing is frequently beekeeper induced under poor foraging conditions and can lead to defensive colony behavior. T F

8. If you requeen in the fall it must be early enough for the colony to establish a compact brood area and store sufficient honey to get through the winter. T F

9. All honeys darken over time and this darkening is dependent on temperature and light. T F

10. The current mite monitoring techniques only provide a rough estimate of mite levels in a colony because they do not measure the reproductive rate or number of reproducing mites in a colony. T F

11. When a worker bee stings the alarm pheromone isopentyl acetate is released from the tissue attached to the sting. T F

12. The bald-face hornet is not a true hornet, but a type of yellow jacket that makes annual nests above ground. T F

13. There are no federal regulations on managing honey bee diseases or the movement of honey bees within the United States. Such regulation is typically done at the state level. T F

Fill in the blanks:

1. The common name for *Apis florea* is the __dwarf honey bee_____ and they make an open nest consisting of one comb that is protected by a layer of _____bees_____.

2. If a colony is left without a queen for too long it may result in _____laying workers_____.
   Symptoms to look for are ___multiple eggs in a cell_____ and a dwindling colony full of drones.

3. A beekeeper can requeen their colony using 1. an adult queen, 2._____a virgin queen_____or 3.___a queen cell_____.

4. If you have a row of white bee hives and you notice a steady increase in population in the end colonies and a decrease in population in the center colonies a behavior called _____drifting_____ is most likely responsible. If you need to keep the same hive arrangement, one way to reduce the occurrence of this behavior is by _____adding colors to the entrances_____.

5. Another name for lifting first instar worker larvae into artificial queen cups for queen rearing is called ___grafting_____. Who is credited with development of this technique?___Gilbert Doolittle_____

6. Royal jelly is made up from two secretions produced by the _____mandibular_____gland and the _____hypopharyngeal_____ gland.

7. A queen honey bee mates with an average of _____10_____to___20_____drones, and stores their sperm in her __spermatheca_____.

8. The father of American beekeeping is ___Langstroth_____ and he is most famous for discovering the concept of ____bee space_____ which helped to create the _____removable frame_____hives we use today.

9. *Varroa destructor* is a serious pest not only because it pierces through the exoskeleton and feeds on the hemolymph and _____fat bodies_____ but most importantly because it vectors _____Viruses_____.

10. Some honeys act like a solid gel in the comb but are liquid once extracted and stirred. This kind of honey is called_____thixotropic_____. The best known honey exhibiting these characteristics is _____heather_____honey from several places in Europe.

11. The mycologist Paul Stamets in collaboration with Washington State University is looking into the use of_____fungi_____for controlling Varroa.

A diploid drone is produced when the egg laid is inseminated with sperm from a drone with a matching sex allele as the queen that laid the egg

12. _____. The production of diploid drones is a sign of _____inbreeding_____.

13. II or AI is also known as ___instrumental insemination_____and is a method used to control mating and aid in stock improvements. In 1944 _____laidlaw_____wrote a description of the valve fold which is tissue that blocks the passage of semen into the median oviduct.

Multiple choice:

1. Slumgum is

a. the material left floating or submerged in hot water after melting old combs in hot water
b. the wax that rises to the top after melting old combs in hot water
c. the hot water press used to remove wax
d. another name for a double boiler
e. an ingredient used to make propolis tincture

2. When a queen receives too little Queen Substance Pheromone from attending workers the queen will
   a. stop laying
   b. lay fertilized eggs in queen cups
   c. lay only drones
   d. leave the colony
   e. die

3. Using a smoker is very important when working a colony because the smoke causes
   a. bees to disperse from frames you are handling
   b. bees to fly
   c. bees to engorge on honey
   d. masking of odors
   e. all of the above

4. Propolis is
   a. plant resin collected by foragers
   b. is the name for waste stored by winter bees
   c. is used to seal cracks and openings in a honey bee colony
   d. has antimicrobial and antiviral properties
   e. everything above except b

5. Adult honey bees have two compound eyes made up of hexagonal visual units called
   a. chemoreceptors
   b. ocelli
   c. corbicula
   d. ommatidia
   e. Johnston's organs

6. Symptoms associated with *Nosema apis* include
   a. quivering, and shaking
   b. hairlessness
   c. dysentery and slow to no build up
   d. supercedure cells and bad temperament
   e. all of the above

7. The Nasonov gland
    a. is located on the workers 7th abdominal segment
    b. releases a pheromone that aids in orienting field bees back to their colony
    c. releases a pheromone that is involved in queen mating
    d. answers a and b
    e. answers a, b and c

8. European Foulbrood or EFB
    a. is caused by the bacterium *Paenibacillus larvae*
    b. infects only adult workers
    c. causes larvae that are consumed by the bacteria to twist and turn a yellowish color
    d. is caused by *Ascosphaera* sp.
    e. Answers a and c

9. Honey bees are considered ideal pollinators in agricultural crops because
    a. They are in the order hymenoptera
    b. They can moved into a crop during bloom
    c. They are faithful and exhibit floral constancy
    d. Each colony contains thousands of potential foragers/pollinators
    e. All except a

10. Which is not a "preferred" method for determining Varroa mite levels in a colony
    a. Powdered sugar shake
    b. Liquid nitrogen freeze assay
    c. Alcohol wash
    d. Sticky board
    e. Answers a and c

11. Alfalfa, *Medicago sativa*
    a. Has blossoms whose stamens explode and hit bees on the head during visitation
    b. Is only pollinated by native bees
    c. Requires very few colonies for adequate pollination
    d. Is grown for hay for dairy cows
    e. Answers a and d

12. Good pollen traps typically
    a. collect 10% of pollen pellets from bees that pass through the grid opening
    b. collect 15% of the pollen pellets from bees that pass through the grid opening
    c. collect 20% of the pollen pellets from bees that pass through the grid opening
    d. collect 50% of the pollen pellets from bees that pass through the grid opening
    e. collect 90% of the pollen pellets from bees that pass through the grid opening

Essays: Pick two

1. Your mentee says to you 'My colony died, what did I do wrong?". Explain how you would guide your mentee in his/her dead colony necropsy.

2. Honey bees are considered eusocial organisms. What are the 3 characteristics associated with eusocial organisms? Because of their complex social behavior, a honey bee colony is often referred to as a superorganism. What does this term mean and describe three ways in which a honey bee colony is a superorganism.

3. Say you are selling your honey at a local farmers market and a customer approaches you and asks if your honey is raw, how would you respond to this question? How would you respond if they asked you if your honey is organic? Or respond to the

customer who asks what advantage does your honey offer to him/her over sugar? (You must explain your answer. A Yes or No will not do.)

4. "Natural" or api-centric beekeeping is based in part on examinations of how colonies living in trees survive. What are 5 major things that such studies have revealed about how we might CHANGE our individual beekeeping

practices/management to increase survivability. If you disagree with the findings why? (minimum three things).