

SEB Linnaean Games 2002 Little, Rock Arkansas

Game 1 NCSU vs MSU 60-15

1. Q The scientific name of American Foulbrood's causative agent is?

A: *Bacillus larvae* (The Hive and the Honeybee, p. 709)

2. Q What is the most destructive insect pest of rice in the United States?

(A) The rice water weevil, *Lissorhoptrus oryzophilus* (Coleoptera: Curculionidae) (Stout et al, 2001. J. Econ. Entomol. 94(4): 963-970).

3. Q. At what stage in a dragonfly's life can it be parasitized by a *Plagiorchis* fluke, and what must happen to the dragonfly for the fluke to complete its development?

A. Nymphs, it must be eaten by a snake so that the fluke can become and adult inside the snake.

Gilbert Waldbauer. 1998. The Handy Bug Answer Book. Visible Ink Press.

4. Q: Clay et al. have shown that fungal endophytes of grasses significantly depress the growth and survival of which insect herbivore?

Answer: fall armyworm (*Spodoptera frugiperda*) 1985. Oecologia 66. (Clay et al.)

5. Q. The separation of the old cuticle and new cuticle in insects is called apolysis. What is shedding of the cuticle?

Answer: Ecdysis Source: Entomology, 2nd edition, Cedric Gillot

6. Q. What is Dzierson's Law? Fertilized egg is diploid and female, unfertilized is haploid and male.

7. Q: Of the following body regions in immature Diptera; head, thorax and abdomen, where is the sternal spatula located?

Answer: Thorax (ventral sclerite on the prothorax) Ref: Manual of Nearctic Diptera. 1981. Vol 1, pg. 79

8. Q. What suborder and family of insect is the vector for River Blindness in Africa, Mexico and Central America?

A4.Nematocera and Simuliidae Ref: Borrer et al. 1989, pp 545

9. In the hindgut, this regulates the movement of material from the midgut to the hindgut?

Answer: Pylorus

Source: Entomology, 2nd edition, Cedric Gillot 1

10. Q. What is the aggregation pheromone of the weevil *Rhyncophorus palmarum*?
A. Rhyncopherol.

11. Q How many ears does a green lacewing have and where is the ear found on the body?
A. Two, one on each forewing.
Gilbert Waldbauer. 1998. The Handy Bug Answer Book. Visible Ink Press.

12 .Q. The larvae of Cicindelidae are parasitized by what family of Dipteran?
A. Bombyliidae Ref:
<http://eny3005.ifas.ufl.edu/lab1/Diptera/Bombyliid.htm>

13. Q. What are the only two genera of sphecid wasps that have species considered to be social?
A. *Microstigmus* and *Arpactophilus*.

14. Q. Where do Embioptera release silk? A. Foretarsi

15. Q What is the family and scientific name of the box elder bug?

A. Rhopalidae; *Boisea trivittatus* (Borrer et al, 1989)

16. Q. Microcaddisflies are found in which family? A. Hydroptilidae

Game 2 LSU vs Tennessee 80-50

1. (Q) Name four (4) families of insects that have raptorial front legs?

A. Mantidae, Mantispidae, Belastomatidae, Nepidae, Naucoridae, and Reduviidae (Borrer et al, 1989)

2 Q. Dung beetles were introduced into Australia to overcome what inability of native dung beetles?

A. The native beetles were adapted to only small, dry dung of kangaroos, not the wet dung of imported cattle.

Gilbert Waldbauer. 1998. The Handy Bug Answer Book. Visible Ink Press.

3. Q: Briefly state Occam's Razor. A. In the absence of experimental data, the explanation requiring the fewest assumptions is the most likely.

4. Q. What family is the Order Ephemeroptera contains immatures known as armored mayflies?

Baetiscidae Source: Stehr, F.W. 1987. Immature insects. Vol. 1.

5. (Q) What is the best strategy to delay resistance to *Pectinophora gossypiella* in transgenic cotton?
(A) Using a high dose + a within-field refuge. (Gould 1998. Annual Review of Entomology 43: 701-726).
6. Question: Give the class and subclass to which medically important mites belong.
Answer: Class: Arachnida Subclass: Acari OR Acarina Ref: A Manual of Arcology, Second Edition. 1978. pg. 5 (G.W. Krantz)
7. Q. The stomatogastric nervous system is associated primarily with what organ?
A. The anterior part of the digestive tract/alimentary canal/gut or brain.
8. Q. What conspicuous, common garden pest wards off some would-be parasites with multi-branched spines that cover its body, and in which life stage is this armor apparent?
A. Mexican bean beetle, *Epilachna varvivestis*, as a larvae. Gilbert Waldbauer. 1998. The Handy Bug Answer Book. Visible Ink Press.
9. Q: What are the requirements of an active ingredient for use in ant baits?
Answer: slow-acting, non-repellent toxicant and toxic when diluted several orders of magnitude
10. Q. What is the predaceous stink bug found in several crops can be easily confused with *Euschistus* spp., a phytophagous penatatomid?
A: *Podisus maculiventris*, the spined soldier bug ref: Handbook of Corn Insects, K. Steffey et al., ESA Publication
11. Most fleas spend only a small portion of their lives on a host. Give the scientific name of one flea that remains embedded in the skin. *Tunga penetrans* (chigoe flea)
12. Q. What is the species name of the only blood sucking moth?
A. *Calpe eustrigata*.
13. The proliferation-gemmulation pattern in freshwater sponges is directly related to what 3 insect orders?
A1. Neuroptera, Diptera and Trichoptera Ref: Tauber (1986) Seasonal Adaptations of Insects, p.259
14. Q: What structure is comprised of one or more groups of chordotonal sensilla located in the pedicel of the antenna? A. Johnston's organ
15. Q1. What is the term for an insect that interact with ants symbiotically?

A1. *Myrmecophilous* Ref: Rosmer and Stoffolano, 1998, p 576

16. Q. What is the oldest synthetic pyrethroid still on the market (2002)? Allethrin

Game 3 Georgia vs. Florida 60-20

1 Q: Milky disease of scarab larvae is caused by infections by bacteria in the genus *Bacillus*. *Bacillus popilliae* is one common species. Name another?
A: *Bacillus lentimorbus*.

2. Q Insecticide synergists such as sesamex and propyl isome function by the inhibition of what? (A) cytochrome P450 Pesticides. Ref: Rose et al. in Toxicology. 1999

3. Q: On a world-wide level, give the name of the Scorpion family that has the most venomous scorpions.

A: Buthidae Ref. Herms's Medical Entomology, Sixth Edition. 1969. (MT James & RF Harwood, eds.)

4. Q. According to Gilbert Waldbauer, the FDA sets limits for insects and insect parts which are published in Food Defect Action Levels. What is the tolerance for insect parts in peanut butter?

A. 30 fragments per 100 grams.

Gilbert Waldbauer. 1998. The Handy Bug Answer Book. Visible Ink Press.

5. Q. How many ears does a praying mantis have and where is the ear found on the body?

A. One, located between the hind legs.

Gilbert Waldbauer. 1998. The Handy Bug Answer Book. Visible Ink Press. Tn

6. Q. What fossil beds in central Colorado are known for butterfly fossils and thousands of other fossil insects and plants?

A2. Florissant Ref: Florissant Butterflies, 1992, T. Emmel et al

7. Q. What is the drop of regurgitated substance occurring at the end of the proboscis of flies referred to as?

A. Vomit drop (Torre-Bueno Glossary of Entomology)

8. Q: Bees that attend the queen and subsequently transmit queen pheromones throughout the colony are known as what?

Answer: messenger bees Ref: The Biology of the Honey Bee. 1987. (ML Winston).

9. Give 3 official common names for *Heliothis zea*?
- A5. Corn earworm, tomato fruitworm and bollworm Ref: Borror et al. 1989, pp 660. Uf
10. Q. What genus includes the southern green stink bug? A. *Nezara*
11. Q. What neurotransmitter regulates bioluminescent flashing by fireflies? A. Octopamine.
12. Q. What is the target of the toxic action of imidacloprid? A. Acetylcholine receptors) msu
13. Q. What is the scientific name of the California red scale? A. *Aonidiella aurantii* (Maskell)
14. Q. The life cycle of this flea found on marsupials is very unusual in that newly emerged larvae are endoparasitic on their host. Give the scientific name of this flea. (A) *Uropsylla tasmanica* Medical & Veterinary Entomology. 2nd Edition. 1995. D.S. Kettle
15. Q. What type of sensory organs respond continuously to deformations and stresses in an insect's body? Proprioceptors Source: Gillott, C. 1995. Entomology. 2nd Ed.
16. Q: The principle blood sugar of insects is a disaccharide called what?
A. Trehalose

Game 4 Auburn vs. Arkansas

1. Q. Chemicals produced by 1 individual that induces a particular behavior or developmental response in other individuals of the same species?
Answer: Pheromones Source: Entomology, 2nd edition, Cedric Gillot
2. Q. This fly feeds on blood and can be an irritant to swine, feeding on the host's head, ears, at cracks and scratches in the skin, or on the legs. These flies only stay on a host long enough to obtain a blood meal and then seek shaded areas. These pests are also an annoyance to humans. Name the common and scientific name of this fly.
A. Stable Fly, *Stomoxys calcitrans* (Linnaeus). Williams et al., ed. 1985. Livestock Entomology. Wiley and Sons.

3. Q. What is the feeding-related distinction between koinobionts and idiobionts?
(A) Koinobionts allow their hosts to continue development after oviposition; idiobionts paralyze or kill their hosts in the process of oviposition.
(p293) Eco Ent Rev (1999) V44
4. Q: What is the use of induced sterility for reducing pest populations called?
Answer: autocidal control Ref: Entomology and Pest Management, 3rd ed 1999. (Z.P. Pedigo)
5. Q. Name a short distance chemical that is used by the queen bee to attract workers? 9-oxodecenoic acid
6. Q. How does the lanternfly (*Fulgora laternaria*) produce the luminescence for which it is named?
A. It's common name is a misnomer... it does not bioluminesce!
7. Q. What is the organic insecticide group that acts both as a contact and stomach poison and acts as an antagonist of the GABA-regulated chloride channel of membranes of the central nervous system
A. Phenylpyrazoles (Fipronil) Ref: Rosmer and Stoffolano, 1998, 473
8. Q: What is the family and common name of *Blissus leucopterus*?
A: Lygaeidae, Chinch bug
9. Q. Name 3 orders in which the larvae are known to invade man and animals and name the specific term for each.
A. .Diptera (Myiasis), Coleoptera (Canthariasis) and Lepidoptera (Scoleciasis)
Ref: The Torre-Bueno Glossary of Entomology, 1989
10. Q. This flea of tropical origin is a pest of poultry, wild birds and various mammals. What is the common and scientific name and where are the eggs deposited?
A. Sticktight flea, *Echidnophaga gallinacea* (Linnaeus) and the eggs are deposited either in the sore or dropped on the ground. Williams, R.E. et al., ed. 1985. Livestock Entomology. John Wiley and Sons.
11. Q: In what form is most nitrogen excreted by aquatic insects? A. Ammonia.

12. Q. the behavior in which female *Photuris versicolor* prey on males of other species by imitating the flash pattern of the prey's female is known as what kind of mimicry?

Answer: Aggressive mimicry Ref: Lloyd, J.E. 1975. Science. 187:452-453.

13. Q. What important pesticide regulatory law was enacted in 1996?

A. Food Quality Protection Act (FQPA) (Ware, George. The Pesticide Book. 2000. W. H. Freeman and Co., NY, NY.)

14. Q. A parasitoid of a parasitoid is referred to by what term?
ANS: "Hyperparasitoid"

15. An introduction stimulus that includes chemical repellents and attractants as well as physical factors such as light and sound that interfere with the insects ability to communicate was coined what term by Wright? (A) metarchon (p237) Ref: Ridgway RC, Vinson SB eds.(1977) Biological control by augmentation of Natural Enemies

16. Q: What is cleptoparasitism?

A: When a second parasitic species competitively displaces a primary parasite in a host.

Game 5 NCSU vs LSU 90-65

1. Q: What is the level of pest insect infestation at which it is wise to treat?

A: The economic threshold r

2. Hyperparasitism has evolved in only three orders, name all three.

(A) Hymenoptera, Diptera and Coleoptera Eco Ent Rev (1999) V44

3. Q. How do worker honey bees regulate the number and caste of future members of the colony?

A. By controlling the number and size of cells in which the queen lays eggs.

Gilbert Waldbauer. 1998. The Handy Bug Answer Book. Visible Ink Press.

4. (Q) What is the initial field frequency of alleles for resistance estimated for insect resistance management programs? (A) 1.5×10^{-3} (Gould et al, 1997. Proc. Natl. Acad. Sci. USA. 94: 3519-3523).

5. Q: Name the organ which releases juvenile hormone into the hemolymph.

- A. *Corpus allatum*.
6. Q. What are the main pollinators of cacao trees? A.
Forcipomyia (Ceratopogonidae)
7. Q. Give the scientific name and country of origin of the small hive beetle. *Aethina tumida* Murray, South Africa
8. Q. Intraspecific competition for which mortality is 100 % for population density above a threshold is referred to by what term? ANS: "Scramble competition"
9. Q. What is the major biological control agent introduced to the Caribbean Islands to control the pink hibiscus mealybug, *Maconellicoccus hirsutus* (Green)?
A. *Anagyrus kamali* (Hymenoptera: Encyrtidae). (Sagarra et al. 2000. Entomol. Exp. Appl. 96: 141-147).
10. Q: *Diadegma insulare* and *Cotesia plutellae* are parasitoids of what important pest of crucifers?
A: Diamondback moth, *Plutella xylostella*
11. Q2. The imported ensign wasp, *Evania appendigaster*, is an egg parasitoid of three cockroach species. What Order and family does it belong to?
A2. Hymenoptera, Evaniidae Ref:
http://creatures.ifas.ufl.edu/urban/roaches/ensign_wasp.htm
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12. Q. Define the difference between ecocline and ecotone.
A. Ecocline refers to a geographical gradient of communities or ecosystems (typically as a result of environmental gradients of rainfall, temperature, nutrient concentrations, etc.). Ecotone is a transition zone between two structurally different communities (i.e., the edge where two or more vegetation types meet). (Ecology and Field Biology, R.L. Smith, ed.)
13. Question: The behavior when smaller, less dominant males assume the courting behavior of a female allowing it to interject between larger males and females is called what?
Answer: pseudofemale behavior
Reference: Forsyth, A. and J. Alcock. 1990. Behav. Ecol. Sociobiol. 26:325-330.
14. Q. Collembolans may be blind or they may have up to how many ommatidia
A5. 16 (8 per side) Ref: Borror et al. 1989, pp 167.

15. Q. The effect of metabolic products of plants on the growth of neighboring plants is known as?
Allelopathy Ecology and Field Biology, R.L. Smith, ed.)

16. Q. The fly *Oestrus ovis* is a worldwide pest of sheep and goats. Where do the adults of this species deposit their larvae on the host and what does this interfere with?

A. In the nostrils and it interferes with grazing! Ref: Williams, R.E. et al., ed. 1985. Livestock Entomology. John Wiley and Sons.

Game 6 Auburn vs Georgia

1. Q. What are the major strategies predatory insects use to capture prey?

A. Searching, ambushing, and trapping.

Gilbert Waldbauer. 1998. The Handy Bug Answer Book. Visible Ink Press.

2. Q. Rift Valley fever (RVF) is vectored a broad range of arthropods. Name three genera of mosquitos that vector RVF?

A: *Aedes*, *Anopheles*, and *Culex* Ref: Ecology of Insects. 1999. pg. 228. (Speight, Hunter and Watt).

3. Q The resemblance of a predator or parasite to a harmless species to deceive potential prey is referred to as?

A. Aggressive mimicry (Ecology and Field Biology, R.L. Smith, ed.)

4. Q In *Ixodes ricinus*, the specialized organ used to apply waterproofing wax to its egg is called what? (A) Gene's organ. Medical & Veterinary Entomology. 2nd Edition. 1995. D.S. Kettle

5. Q. Where do adult weaver ants obtain the silk used to "sew" together their leaf nests?

A. Some workers hold leaves together while others hold larvae between their mandibles. The larvae exude the silk, which adults do not make.

Gilbert Waldbauer. 1998. The Handy Bug Answer Book. Visible Ink Press.

6. Q: What is the name for the ecological approach to pest control?

A: Integrated pest management

7. Q. The reciprocal of the slope of a plot of developmental rate vs. temperature is referred to by what term?ANS:

"Developmental requirement" or "Degree-day requirement" or "Day-degree requirement"

8. Q. The Hymenopteran family Encyrtidae includes many species that have been used to control mealybug pests around the world. Name 3 of the 5 most commonly used genera:

A. *Anagyrus*, *Leptomastix*, *Apoanagyrus* (*Epidinocarsis*), *Pseudaphycus*, and *Leptomastidea*.

Ref: Field production of two species of parasitoids of the Diamondback moth (Lepidoptera: Plutellidae). 1998. Florida Entomologist. 81(4): 526-534. (GY Hu, ER Mitchell, DH Siegluff and JS Okine).

9. Q: What is the currently accepted genus and species of the Argentine ant?

A: *Linepithema humile* (Mayr)

10. Q: If one possessed a can with the name Spectracide on it, what would be the common name of the insecticide it contained? A. Diazinon.

11. Q. Name the insecticide that can be derived from the roots of *Derris elliptica* as well as *Lonchocarpus utilis*. (A) Rotenone

12. Q1. *Cricotopus lebetis*, a midge fly, has shown promise in the control of what aquatic weed?

A1. *Hydrilla*, *Hydrilla verticillata*

Ref:

http://creatures.ifas.ufl.edu/aquatic/hydrilla_tip_mining_midge.htm

13. Q. What OP was recently proven effective against the small hive beetle and what is the brand name? Coumaphos, CheckMite

14. Q. What type of biological control involves the importation of an exotic control agent to control an introduced pest? A. Classical biological control

15. Q. Name three families of insects that possess urticating hairs.

Lymantriidae, Megalopygidae, Saturniidae. Medical Entomology, W.B. Hens and M.T. James, eds.)

16. Q. What family of Orthoptera is known to produce and use silk?

A2. Gryllacrididae (camel crickets) Ref: Borrer et al. 1989

Game 7 NCSU vs Auburn

1. Q: What is a hypodigm?

A. The entire known material of a species which is available to the taxonomist

2.Q. The process in which an oocyte produces yolk?

Answer: vitellogenesis Source: Entomology, 2nd edition, Cedric Gillot

3. Q: What does the Ebeling choice box measure and for what insects was it developed?

A: measures repellency and mortality; first developed for use with cockroaches

4. Q. What large, bright pink insect uses blooms of the same color to camouflage itself while it lays in wait to ambush its next prey victim?

A. The orchid mantis, *Hymenopus coronatus*.

Gilbert Waldbauer. 1998. The Handy Bug Answer Book. Visible Ink Press.

5. Q: What is the most economically significant insect pest on southeastern crops?

A: *Helicoverpa zea*

6. Q. Five species of parasitic mites infest dairy cattle. Name the scientific name for 3 of these parasitoids and the type of parasitism demonstrated.

A. *Sarcoptes scabiei*, *Chorioptes bovis*, *Demodex bovis*, *Psorergates bos*, *Psoroptes ovis*, and obligate parasites. From Livestock Entomology, Williams, R.E. et al., ed. 1985. Livestock Entomology. John Wiley and Sons.

7. Q Scrub typhus is vectored by trombiculid mites and has an associated mortality which may exceed 30% in untreated cases. What is the etiological agent of this disease? (A) *Rickettsia tsutsugamushi*. Medical & Veterinary Entomology. 2nd Edition. 1995. D.S. Kettle

8. Q: In the equation $EIL = C/VIDK$, what does K represent? (A: the efficacy of the control tactic being considered; e.g., insecticide)

9. Q. Stewarts' Wilt, a disease of corn plants caused by the bacterium *Erwinia stewarti*, is transmitted circulatively by what 3 vectors?

A1. Corn flea beetle (*Chrysomelidae*), Corn rootworms (*Chrysomelidae*) and Seedcorn maggot (*Anthomyidae* ref: The Torre-Bueno Glossary of Entomology, 1989

10. Q: Differentiate between inoculative and inundative insect releases.
A: Inoculative – release of natural enemies that are expected to colonize and spread throughout a natural area.
Inundative – widespread release of natural enemies for the purpose of pest population suppression with little or no impact from the progeny of released individuals. Ref: Entomology and Pest Management, Third edition. 1999. (Z.P. Pedigo)
11. Q Name a family of insects whose members only have one ovary?
A. Scarabaeidae (Hanski et al, 1991)
12. Q Name the parasitoid that attacks the cotton aphid. A.
Lysiphlebus testaceipes
13. Q. What is the scientific name of the horse louse? A1.
Haematopinus asini (Linnaeus).
Ref: Borror et al. 1989, pp 281.
14. Q. The “black witch” is considered a harbinger of death in Central and South America. What is the species and family of this beast? A. *Ascalapha odorata*: Noctuidae.
15. Q. What is the most commonly used biological control agent in greenhouses and what pest is it used against?
A. *Encarsia Formosa* Gahan, against whiteflies. (Wawrzynski et al. 2001. American Entomologist. 47: 228-234.)
16. Q. What mycosis of insects is caused by *Metarrhizium anisopliae*?
Green muscardine
Source: Torre-Bueno, J.R. 1989. The Torre-Bueno glossary of entomology.

Bonus Questions for SEB Linnaean Games 2002

1. Q. The first Southeastern Branch Linnaean Games was held in 1983. Either state where they were held or who won? A. Little Rock (Jan 1983), Clemson

2. Q. Who wrote The Pentatomoidea (Hemiptera) of Northeastern North America ? A. J. E. McPherson

3. Q. What well-known contemporary entomologist authored the book "Wasp Farm"?

A. Howard Ensign Evans.

5. Q: When it invaded the U.S., what continent did the German cockroach come from?

A: Africa

6. Question:

In recent years many papers concerning scale insects have been published under the Order Hemiptera instead of Homoptera. What is the main reason for this?

Answer: Because, new morphological and phylogenetic analyses do not support the monophyly of Homoptera and render it as paraphyletic. **Or:** because some authors consider the Homoptera as being paraphyletic, and thus not a natural group.) Ref: Gullan, P.J. (1999) Why the taxon Homoptera does not exist. Entomologica, Bari, 33: 101-104.

7. Q On December 3, 1984, a chemical was discharged from a Union Carbide facility into the surrounding community of Bhopal, India and caused 2,500 immediate deaths and up to 300,000 people injured. What was the chemical?

Answer: Methyl Isocyanate (MIC), it was used in the manufacture of an insecticide carbaryl (trade name is sevin). Ref: Chris Kent. Basics of toxicology, pp.2.

8. Q. Who coined the term Integrated Pest Management? Stern, Hagen, Smith, Vandenbosch (1959)

9. Q. Who was the famous entomologist that traveled with Alfred Russell Wallace to Brazil?
A. Henry Bates
10. Q. In the former U.S.S.R. extensive investigations on the study and commercial testing of *Trichogramma* were begun in 1937 after the organization of what laboratory?
(A). Biomethods laboratory of the All-Union Institute of Plant Protection (AIPP) now called the All-Russian Institute of Plant Protection (p284) Ridgway RC, Vinson SB eds.(1977) Biological control by augmentation of Natural Enemies
11. Q: What are allopatric and sympatric distributions?
A. In allopatric the species' range do not overlap while in sympatric the species' range broadly overlap
12. Q What is the scientific name of the Egyptian's "Sacred Scarab"?
(A) *Scarabaeus sacer* (Hanski et al, 1991)
13. Q Epidemic typhus usually cycles between humans and lice. Recently, another reservoir has appeared in the U.S. What is this reservoir? (A) the Eastern Flying Squirrel. CDC
14. Q4. What is the only agricultural pest driven to extinction?
A4. Rocky Mountain Grasshopper (*Melanoplus spretus*) Ref: Rosmer and Stoffolano, 1998, p 440
15. Q. *Limenitis archippus* is a mimic of a famous insect. Give the common and scientific name of the model.
A: *Danaus plexippus*, the monarch butterfly
16. Q. The Federal Insecticide Act of 1910 was replaced with a new law, the Federal Insecticide, Fungicide, and Rodenticide Act of 1947. Name four classes of biocides it regulates.
A. Insecticides, fungicides, rodenticides, herbicides, and disinfectants (Fundamentals of Applied Entomology, R.E. Pfadt, ed.)
17. Q:What does RPAR stand for?
A:Rebuttable Procedure Against Registration
18. Q. Who was the individual responsible for the importation of the gypsy moth? (A) Leopold Trubelot
19. Q. Benjamin Franklin is best known for his career as a statesman and inventor. Less well-known is his work with what insect group?
A. Mayflies (Ephemeroptera). (Evans, Pleasures of Entomology, p. 174).

19. As of 2002, which two schools have won the SEB Linnaean Games the most? NCSU with 6 and Arkansas with 5.

20. Q. What fungus was used against the chinch bug, *Blissus leucopterus*, in 1890 in almost all of Kansas, and this was considered the 1st large scale microbial control program in the U.S.?

Answer: *Beauveria bassiana* Source: Entomology, 2nd edition, Cedric Gillot

21. Q. What is the name of the lady that won the SEB Linnaean Games at two SEB schools as well as coached a couple of National championship teams? A. Dr. Nancy Hincle, Auburn & Florida

22. Q. What does *Danaus plexippus* mean?

A. *Danaus* is named for Danaos, the Egyptian founder of Argos and father of the Danaides, and *plexippus* is the name of one of his sons (“catches horses with a rope”).

23. Q. Who wrote the 1876 book “The Geographical Distribution of Animals” which recognized 6 biogeographic realms of existing animals and how many are recognized today?

A4. Alfred Russel Wallace and 9 Ref: Price, Insect Ecology 1987, p. 418;
<http://www.sciref.org/net/net0/realms.htm>

24. Q: What is the extractable protein of the insect cuticle called?

A. Arthropodin

25. Q: Proteases are enzymes that act principally by hydrolytically splitting protein molecules. Where on the protein molecule does this splitting take place?

A. The peptide bond (linkage)

26. Q Who 1st reported the usefulness of cochineal to Europe?
(A). Hernando Cortez

27. Q. This notable hymenopterist also determined mental capacity and sexual selection of jumping spiders. In 1898, he published On the Instincts and Habits of Solitary Wasps that was later revised to Wasps Social and Solitary. Who was this man?

Answer: George William Peckam Ref: American Entomologist. 1971. Arnold Mallis. Auburn

28. Established in 1963 and funded by the USDA, it ensures that American farmers have an adequate supply of pest control products registered for minor crops and for minor uses on major crops? Answer: IR-4 Source: Radcliffe's IPM World Textbook, E,B, Radcliffe and W.D. Hutchison
29. Q: Malaria is not endemic to the United States, how did malaria enter the U.S.?
A: From slaves being carried to the U.S. from Africa
30. Q. Agostino Bassi was the 1st person to demonstrate conclusively that a microorganism is the cause of an infectious disease of an animal but who is usually credited as laying the foundation of the "germ theory disease"? (A) Louis Pasteur Waldbauer G (1998) The handy bug answer book.
31. Q. Witchety grubs are considered a delicacy in Australian Aboriginal society. What is the species and family of this delicacy? A. *Xyleutes leucomochla*: Cossidae
32. Q: "Everything is poison, and nothing is without poison. The dose alone makes a thing poisonous." This famous sentence comes from which toxicologist?
Answer: Paracelsus. Ref.: Hans Marquardt, Siegfried, G. Schafer, Roger O. McClellan, F. Welsch. Toxicology, pp. 11.
33. Who was the first Federal entomologist? Townend Glover
34. Q. In 1675, Dutch biologist Jan Swammerdam is given credit for the first detailed account of a member of what order of insects first observed by Aristoteles as "one day living"?
A5. Ephemeroptera Ref: 1983, Proc.of the 4th International Conf on Ephemeroptera.
35. Q What is the E. P. A. definition of "high dose" in the context of insect resistance management?
(A) 25 times the toxin concentration needed to kill susceptible individuals (Gould 1998. Annual Review of Entomology 43:701-726).
36. Q. The "Father of American Economic Entomology" wrote the "Report of insects of Massachusetts...", which became a model for similar publications in other states. Who was this entomologist? A. Thadeus Harris
37. Q. C.V. Riley sent Albert Koebele in search of a biocontrol agent for the cottony cushion scale and found the vedalia beetle. What year did he find the beetle and where did he

- find it?
- A2. 1888 and Australia Ref: Rosmer and Stoffolano, 1998, p 459
38. Q. This chemical compound is a tar derivative that is relatively nontoxic to mammals but very toxic to plants. It is used as a soil fumigant as well as a fumigant for the clothes moth. Name the chemical.
Naphthalene (Fundamentals of Applied Entomology, R.E. Pfadt, ed.)
39. Q. Which former insecticide has been used as a coyote poison in the western U.S.? Fluoroacetic acid or 1080
40. Q. Digital tools such as Geographic Information Systems and Global Positioning Systems, combined with soil mapping and yield monitors to make crop management decisions is referred to as what type of agriculture?
Answer: Precision Agriculture ref: Radcliffe's IPM World Textbook, E,B, Radcliffe and W.D. Hutchison
41. Q: The term 'superorganism' was coined to denote insect societies that possess feature of organization analogous to the physiological processes of individual organisms. Who coined the term and in what year?
Answer: William Morton Wheeler, 1928 Auburn Ref: The Social Insects: Their origin and evolution. 1928. WM Wheeler.
42. Q. Name the author of the book "Beetles of the United States." Ross Arnett
43. Q. The donation of federal land for the endowment, support, and maintenance of at least one agricultural and mechanical college per state was enacted according to the Morrill Land-Grant College Act of 1862. What and when was the first establishment of state agricultural experiment stations?
Hatch Act of 1887 (Fundamentals of Applied Entomology, R.E. Pfadt, ed.)
44. Q. Give the scientific names of three common urticating caterpillars. *Automeris io*, *Euproctis chrysorrhoea*, *Lymantria dispar*, *Megalopyge opercularis*, *Sibine stimulae*.
45. Q. What is the country of origin of *Cactoblastis cactorum*?
A1. Argentina Ref:
http://creatures.ifas.ufl.edu/bfly/cactus_moth.htm
46. Q. Name the two most common inhabitants in pitcher plants of the genus *Heliamphora*?
A. *Wyeomia* (Culicidae) and *Metriocnemus* (Chironomidae).

47. Q: "The World Is Green" hypothesis was proposed to explain population control of herbivorous insects. Who proposed this hypothesis, in what year, and by what means were populations controlled?

Answer: Hairston, Smith and Slobodkin, 1960, by top-down control (i.e. Predators control herbivores) Ref: Community structure, population control, and competition. 1960. American Nat. 44:421-5. (NG Hairston, FE Smith & LB Slobodkin).

48. In what area did Paul Muller, the discoverer of DDT, receive a nobel prize? Medicine

49. Q. What family of Blattaria is primarily restricted to the Appalachian Mts in North America? Cryptocercidae

50. Q Juvibione was isolated in what plant and where was it first discovered?

A4. American Balsam Fir and Harvard University

51. Q *Nosema pryausta*, *Vairimorpha necatrix* and *Nosema furnacalis* are species of Microsporidia used for biological control of what lepidopteran pest?

Answer: European corn borer, *Ostrinia nubilalis*

52.Q. What is the species name of the mosquito larvae that live exclusively in the water of pitcher plants? (A) *Wyeomyia smithii* Waldbauer G (1998) The handy bug answer book

53. Q: Onchocerciasis, or river-blindness, is caused by the filarial nematode parasite, *Onchocerca volvulus*. How many insect genera vector river-blindness and what are they?

A: One, *Simulium* (Diptera: Simuliidae Ref: Ecology of Insects. 1999. pg. 234. (Speight, Hunter and Watt).

54. Q. Name three families of Coleoptera that discharge blood (reflex bleeding) in response to a threat?

A1. Coccinellidae, Chrysomelidae, Meloidae, Lampyridae and Lycidae. Ref: Rosmer and Stoffolano, 1998, p 244

55. Q: What is the causal agent of Rocky Mountain spotted fever?

A: *Rickettsia rickettsia*

56. Q Where was the vedalia beetle released for the control of the cottony cushion scale and what industry did it save?

A3. California and Citrus

Ref: Rosmer and Stoffolano, 1998, p 459

57. Q: What are the vectors of Rocky Mountain spotted fever?

A Ticks: Brown dog and Wood

58. Q: What disease does the mosquito, *Toxyrhynchites rutilis* vector?
 A: This mosquito does not vector any disease and is a predator of other mosquitoes in the larval stages
59. Q: How do Bumble Bees overwinter?
 A: As a single overwintering queen which has mated during the previous autumn
 (The Hive and the Honeybee, p. 649)
60. Q. What is the scientific name of the Tumbu or mango fly?
Cordylobia anthropophaga
61. Q. Who was America's first native entomologist? William D. Peck (1763-1822)
70. Q. The condition in which extremities become shorter with increased latitude is known as?
 A. Allen's Rule Ecology and Field Biology, R.L. Smith, ed.)
71. Q. The trout stream beetles are a member of what family and what part of North America are they primarily found? A. Amphizoidae and the Western portion Ref: Borror et al. 1989, pp 410.
72. Name the Pthirapteran Suborder characterized by a cylindrical snout and the two host animals on which they are found.
 A2. Rhyncophtherina; the Indian elephant and warthog
 Ref: : Borror et al. 1989, pp 275.
73. Q. What insect holds the record for the longest dormancy?
 (A) Yucca moth Larvae Powell J.A. 2001. Annals of ESA 94: 677-680.
74. Name the entomopathogenic fungus that attacks the cotton aphid. A. *Neozygites fresnii*
75. Q. Protoplasmic poisons, such as arsenicals, kill by precipitating what?
 A2. Proteins Ref: Rosmer and Stoffolano, 1998, p 474
76. Q. Name the family (Diptera) that transmits Carrion's disease (bartonellosis). A. Psychodidae
77. Q. Name two functions of bioluminescence?

- A. Attracting prey, attracting a mate and for increased visibility (Borror et al, 1989)
78. Q. What is the subfamily of the most primitive ants and where can they be found?
A. Myrmeciinae and Nothomyrmecinae in Australia.
79. Q. The mouthparts of Ixodes males are functional for what purpose only?
(A). copulation (p165) Eco Ent Rev (1999) V44
80. Q. Inka cells are part of what gland? A. Epitracheal or peritracheal glands
81. Q. In the cell, the Krebs's cycle occurs where?
A. In the mitochondria
82. Q. Compare lentic and lotic. A. lentic is standing water as found in ponds and lakes while lotic: running water
83. How many antennal segments do stink bugs have? A. 5
84. Name the act that established the Land Grant college system with emphasis on the study of ag sciences. A. Morrill Act (1862)

Spare Questions

1. What are spongilla flies? Sisyridae (Neuroptera)
- 2 Name a family of Apoidea that lines it's nests with cut leaves.
Megachilidae
3. Name a family of Hymenoptera that preys exclusively on spiders. Pompilidae
4. Where does Embioptera release silk? Fore tarsus
5. Q What family, genus and species of the Coleoptera produce paedogenetic larvae?
A. Micromalthidae; *Micromalthus debilis* (Borror et al, 1989)
6. Q. How does the adult tobacco hornworm, *Manduca sexta*, regulate its body temperature?
A1. Shivering" to warm up and increased heart rate to cool down.
Ref: Rosmer and Stoffolano, 1998, p 247

7. Q. Give the scientific name of and the formula for how the snowy tree cricket approximates temperature?
 A. *Oecanthus fultoni* and add 40 to the number of chirps in 15 seconds for degrees Fahrenheit
 Ref: Ref: Borror et al. 1989, pp 223. Msu
8. Q. What is the term given to the paired, sclerotized, dorsal processes that project from the posterior edge of the 9th tergum on some Coleoptera larvae?
 A. Urogomphi Ref: Immature Insects, Volume II, 1991, F. Stehr, p 933
9. Q. What was the approximate total cost that C.V. Riley incurred for the control of the cottony cushion scale by the vedalia beetle in the late 1800's?
 A1. \$2000 Ref: Rosmer and Stoffolano, 1998, p 459
10. Q. Name 3 physiological disorders caused by feeding of *Bemisia argentifolii* on their hosts.
 A4. Squash silverleaf disorder, tomato irregular ripening, lettuce stem blanching, carrot light root, and pepper streak
 Ref:
http://creatures.ifas.ufl.edu/veg/leaf/silverleaf_whitefly.htm
11. Q. What is the name of the processing area at the inner edge of the base of the mandible?
 Mola
 Source: Borror, D.J., C.A. Triplehorn, and N.F. Johnson. 1989. An introduction to the study of insects. 6th Ed.
12. Q Originally discovered in 1982 from soil samples from the Caribbean, the spinosyns are highly active against economically important Lepidoptera as well as pests from several other orders. Give the scientific name of the actinomycete from which spinosyns are derived. (A)
Saccharopolyspora spinosa
13. Q. Name 3 orders of mammals, which have evolved insectivorous specialists
 A5. *Chiroptera, insectivora, edentata.* Ref: Nowak and Paradiso, 2002 (Walker's Mammals of the World (pages unavailable in Uncorrected Proofs))

14. What family of Blattaria is restricted to the Appalachian Mts in North America? Cryptocercidae
15. (Q) What subfamily of the Scarabaeidae contains the heaviest living insect species recorded?
A. Cetoniinae (Borror et al, 1989)
16. Carrion's disease (bartonellosis) is caused by what pathogen (scientific name)? *Bartonella bacilliformis* (Bacillus)