	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF ZOOLOGY		
	EXAMINATION FOR (SECOND YEAR) STUDENTS OF CHEMISTRY/ENTOMOLOGY		
COURSE TITLE:	Economic Entomology		COURSE CODE: EN2123
24-3-2021	FIRST TERM	TOTAL MARKS:150	TIME ALLOWED: 2 HOURS

Section A

الامتحان في ورقه واحده

1-State whether the following sentences are true (√) or false (×).(3 marks each, total 30 marks)

- Aesthetic value of insects comes only from their shape. ()
- The stings of honey bees have medical value for diseases such as influenza. ()
- Silk worm adults feed on mulberry leaves ()
- A larva of silk worm enclose itself in a cocoon which consists of many natural silk threads. ()
- Honey is an insect product while beeswax is a natural secretion. ()
- Beewax is used for manufacturing candles, dental impressions and crayons. ()
- The lac insects produce shellac to harden the host plant. ()
- The light produced by the bodies of fireflies is visible. ()
- Cochineal bugs feed on plant galls. ()
- Chalcid wasps can attack all insect species. ()

2. Give short notes on the following: (each 10 marks, total 20 marks)

- The importance of insects in scientific research
- The economic importance of shellac.

Section B

A-Indicate whether the following statements are true or false without correction the false one (Total:20 marks,2 mark each) :

- The alfalfa mosaic viruses are transmitted by white fly. ()
- The cottony cushion scale is a serious pest of cotton.()
- The amount of damage done by plant bugs varies with different species, owing to the different sizes of the bugs. ()
- The straw berry weevil damage blossoms during oviposition activity-()
- Squash mosaic virus is transmitted by aphids.()
- One of the common fungi is sooty mold fungus *Erwinia amylovora* .which causes the troublesome sooty mold of citrus fruits ()
- Bruchidae. are known as pea weevils They are serious pests of leguminous plants () .
- White grubs are pests of tomatoes()
- Double cotton seeds are formed by the hibernating larvae of the cotton leaf worm.
- The cotton leaf curl virus is transmitted by white fly () .

B-Give a short notes on the following (Total 30 Marks, 5 Marks each)

- Ergot of cereals and grassess.
- Potato blackleg
- Stigmiosis.
- Psyllids
- injury by insects that care for other insects.
- Symptoms of palm infestation by red palm weevil.

Section C


1-Mention the economic threshold effect of these pests? (Total 25 marks)

- a.Horse bot. b. Horse Flies c. Poultry lice d. Culex Sp e. House fly

2-Based on your study: What are the effect methods will apply to control the following insects? (Total 25 Marks):

- a. Stable flies b. Mosquitoes c. Termites d. Black fly e. fleas

Examiners: Dr. Samar El Kholy, Dr. Noha Dabour and Dr. Mohamed Shahen

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF ZOOLOGY		
	SECOND YEAR ENTOMOLOGY STUDENTS		
	COURSE TITLE: ENTOMOLOGY	INSECT MORPHOLOGY	COURSE CODE: : EN2121
DATE: MARCH 2021		TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

(وتكون الامتحان من صفتين)

1- Indicate whether the following statements are true or false and correct the false sentences: (Total: 30Marks, 3 Marks each).

- 1- Dragon flies have approximately 50.000 ommatidia per eye ()
- 2- Styli present in male cockroach and borne on the 9th abdominal sternum ()
- 3- In piercing sucking M.p maxilla and labium are of siphoning type ().
- 4- Abdominal legs are confined to the immature stages of holometabolous insects ()
- 5- The femur is the largest part of the legs in most adult insects ().
- 6- Filiform antennae are present in grasshopper ()
- 7- The suture is impressed line separating sclerites while sulci are impressed line separating segments ()
- 8- In Pterygota the loss of wings is secondary charcter ()
- 9- In male Embioptera (web spinners) the cerci are asymmetrical ().
- 10- Spinnerts present in the mouth parts of dragonfly naiads ()

2- Fill in the blanks with the appropriate words:(Total 30marks: 3 each).

- 1- The principle food canal of chewing lapping mouth parts present in..... while the additional one lies between and
- 2-is a prolongation of floor of mouth and attached to the inside wall of the labium.
- 3- The postgenital region consists of the segments.....
- 4- Galea and lacinia are parts of in the mouth parts
- 5- Maxillae are strongly sclerotized with serrated distal ends, while mandibles with blade ends in mouth parts
- 6- Lace wings present in
- 7- The needle ovipositor present in
- 8- 11th abdominal segment consists of and
- 9- The post-occipital suture, which represents the line of fusion of the and... .. segments.
- 10- Aphids release from the cornicles if they are attacked by parasites and predators

3- Choose from between the brackets the correct word: (30 marks: 2Marks each)

- 1- (Clypeus-vertex-gena) is the head region located below the compound eyes.
- 2- The triangular plate of siphoning mouth parts is the (labrum-labium-labellum)
- 3- In grasping- cutting M.P (mentum-submentum- prementum) carrying the grasping jaws.
- 4- (Hypognathous- opithognathous- prognathous) is the orientation of the head in which the mouth parts oriented ventrally.
- 5- There are (one- two- three) cervical sclerites on each side of the insect neck.
- 6- (Mid legs-hind legs –fore legs) of the honey bee worker acts as a grooming organ.
- 7- Parasitic ichneumon wasps have extremely (long- short- reduced) ovipositors.
- 8- The legs type of human lice are (swimming- skating- clinging)
- 9- Hamuli represent the wings coupling of (moths- house fly- honey bee).

- 10- In piercing sucking M.p (labium- labrum- mandibles) doesn't penetrate the wound of mosquito bite.
- 11- (Remigium- vannal- stigma) is a conspicuous opaque spot near the costal margin of the wing
- 12- the terminal segments are expanded laterally in (clavate- capitate- lamellate) antennae
- 13- pre-antennary segment bears (protocerebrum- deutocerebrum- tritocerebrum)
- 14- Pseudotrachea present in (Sponging- chewing & lapping- siphoning) mouth parts.
- 15- The scape of antennae pivots on the (antennal socket- antennal sclerite- antennifer).

4- Discuss each of the following with fully labeled drawing (Total: 60 Marks, 10 marks each)


- a) Wing-coupling mechanisms
- b) Piercing and sucking & chewing lapping MP
- c) Integumentary processes
- d) Insect integument and moulting
- e) The arrangement of the principal veins in a hypothetical wing venation
- f) Female ovipositor

GOOD LUCK!

Examiners

Prof. Dr. Mohamed Soliaman

Prof. Dr. Mervat Abou Seada

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF ZOOLOGY			
	EXAM FOR SOPHOMORE STUDENTS OF CHEMISTRY/ENTOMOLOGY			
	COURSE TITLE:	INSECT MORPHOLOGY & ANATOMY الأسئلة في صفحتين		COURSE CODE: EN 2121
DATE	MARCH 2021	TERM: FIRST	TOTAL MARKS:150	TIME ALLOWED: 2 HOURS

Answer the following questions in your answer booklet

PART I Morphology (75 marks)

1. State whether the following sentences are true or false (18 marks, each 2):

- A. The antennae of ants are the moniliform type.
- B. The forewings of the dragonfly are the membranous type.
- C. True-legs are outgrowths of abdominal segments of caterpillars.
- D. The immature stage of hemimetabolous insects is called nymphs.
- E. The molting fluid contains chitinase and protease capable of digesting the endocuticle.
- F. Stinging apparatus is a modified copulatory organ of honeybee males.
- G. Hexapoda contains insects and non-insect organisms.
- H. Naiad of a dragonfly has piercing-sucking MP.
- I. The forewings of cockroaches are the membranous type.

2. Fill in the blanks below with the appropriate words (18 marks, each blank 2):

- A. If the terminal segment of antennae is gradually enlarged, the type is termed.....
- B. In siphoning mouthparts, the absent part is the
- C. The labrum of chewing type is bilobed plate moving.....
- D. The cuticle is a noncellular layer secreted by.....
- E. In the.....pupa, the legs and wings are glued to the body which is covered by a cocoon.
- F. The integument of insects is an against many pathogens and insecticides.
- G. are paired segmented appendages located on the head usually below or between the compound eyes
- H. The region consists of the segments beyond the 9th abdominal.
- I. Insects are the most important group of animals in term of

3. Choose the right answers in the following (Total: 18 marks, each 2):

- A. The hind legs of honeybee are (collecting - swimming – jumping).
- B. In the (frenulate – hamulate – jugate) coupling apparatus, tiny hooks of the hindwing fasten into a fold in the front wing.

- C. The hindwing of Diptera is (halter – hairy – membranous).
- D. The earwigs have powerful (cornicles – styli - forceps-like cerci).
- E. The (noncellular – internal – multicellular) integumentary processes are hollow outgrowths of the integument lined with epidermal cells.
- F. A bee beat its wings at (180 - 5 – 100 – 500) Hz.
- G. Motion in insects is accomplished by a (dipod – tripod – tetrapod) mechanism.
- H. (Moulting – Ecdysis) is shedding or slipping out of the old cuticle.
- I. In (campodeiform – eruciform – scarabaeiform - verniform) larva, the body is cylindrical with short thoracic legs

4. Only with fully labeled drawing illustrate: (21 marks)

- Stinging apparatus (11 marks).
- Piercing-sucking mouthparts (10 marks).

PART II Anatomy (75 marks)

5. Choose the correct answer (20 marks, 2.5 marks each).


- A. Royal jelly is secreted by hypopharyngeal gland of (nurse worker - forager worker - queen) honey bee.
- B. Honey stomach of worker honey bee is (ectodermal – mesodermal - endodermal) in origin.
- C. Most of digestion take place in (gizzard – oesophagus - midgut) of insects.
- D. Fermentation chamber is modification in (rectum - midgut - heart) of white ants.
- E. What is not belonging to fore gut (honey stomach – oesophagus - rectum).
- F. Storage excretion takes place in (Malpighian tubules – fat body - salivary gland).
- G. Circulatory system of insect is (open ventral - open dorsal - closed dorsal).
- H. Unfertilized egg laid by queen honey bee grew to (worker – queen - drone).

6. Answer the following items (55 marks).

- A. Mention the modification in the structure alimentary canal of insects according to their food habitat. (20 marks)
- B. Write a short note on: -Types of insect ovary (10 marks)
 - Function of insect haemolymph. (5 marks)
- C. Discuss: - Respiration in aquatic insect. (10 marks)
 - Types of Reproduction of insects. (10 marks)

Good Luck

Examiners	Dr Elsaied ahmed Naiem	Dr. Wesam Meshrif
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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF ZOOLOGY		
	EXAM FOR JUNIORS (SECOND YEAR) STUDENTS OF SPECIAL ENTOMOLOGY		
	COURSE TITLE:	INSECT RELATIONSHIPS	COURSE CODE: EN 2109
DATE:	TERM: FIRST	TOTAL ASSESSMENT MARKS:100	TIME ALLOWED: 2 HOURS

Note: The Exam in two pages

Answer the following questions:

1) Give a short account on the followings, and give examples: (20 marks, 4 marks each)

- 1) Beneficial bacteria to insects.
- 2) Ectosymbiosis between attine ants & fungi.
- 3) Cytoplasmic polyhedrosis viruses infecting insects.
- 4) Insects as vectors of rickettsial human diseases.
- 5) Flagellates – insects associations.

2) Complete the following sentences: (10 marks)

- a) Bacteria are externally carried on insect body in huge number, due to: 1. and 2.
- b) Spirochaetes are unique in having, they are transmitted by, causing in humans.
- c) Symptoms of protozoan infections in insects are 1., and 2.:
- d) Entomopathogenic nematodes live in insects as, they carry within their bodies, and they are commercially produced as

3) Choose the correct answer: (20 marks, 1 mark each)

1. Blowfly larvae harbor *E. coli* that secret
a) vitamin b) antibody c) enzyme d) antibiotic
2. *Salmonella enterica* transmitted by house fly can cause disease.
a) typhoid b) anthrax c) cholera d) Bacillary dysentery
3. The following insects can cultivate fungi to form fungus gardens EXCEPT
a) termites b) ants c) grasshoppers d) beetles
4. fungus parasitizes grasshoppers and aphids.
a) *Entomophthora* b) *Empusa* c) *Ambrosia* d) *Termitomyces*
5. Red rot of sugar cane is a disease
a) algal b) bacterial c) fungal d) viral
6. Cricket canker of apples is transmitted by tree crickets through
a) pollination b) contamination c) insect exudates d) oviposition
7. Sooty mold of citrus is caused by a fungus living on honey dew of
a) aphids b) bees c) crickets d) bugs
8. Woolly apple aphids live together with a fungus and cause
a) fire blight b) blossom blight c) brown rot of apple d) canker of apple
9. Viruses cause virulent diseases to insects, especially
a) bees b) ants c) butterflies d) cockroaches
10. Nuclear polyhedrosis in cotton leaf worm is disease.
a) bacterial b) protozoan c) viral d) fungal
11. Squash mosaic virus can be transmitted to plants by aphid
a) mouthparts b) saliva c) legs d) body hairs
12. are vectors of potato leaf roll virus.

- a) Mosquitoes b) Sandflies c) Butterflies d) Aphids
13. sp. is the vector of the human neurotropic disease.
a) *Culex* b) *Phlebotomus* c) *Aedes* d) *Anopheles*
14. Sandfly can transmit the disease.
a) yellow fever b) dengue fever c) papatasi fever d) rift valley fever
15. Clover leaf roll fever is a disease.
a) fungal b) viral c) spirochaetal d) rickettsial
16. *Malamoeba locustae* is an amoeboid protozoon affecting
a) sand fly b) tsetse fly c) locusts d) bugs
17. Appearance of pepper-like spots on silk worm is a symptom of disease.
a) muscardine b) typhus c) Chagas d) pebrine
18. *Nosema apis* is the causative agent of nosema disease in
a) ants b) bees c) silkworms d) grasshoppers
19. *Nosema* is a commercially available for the control of grasshoppers.
a) *bombycis* b) *apis* c) *pyrausta* d) *locustae*
20. Ciliates of genus *Ophryoglena* can infect the nymph of
a) housefly b) sandfly c) mayfly d) horsefly

4. Complete the following sentences with appropriate words: (20marks, 2 marks each)

- a- Entomophobia is.....
- b- Commensalism is
- c- Myiasis is invasion of living-organism tissues by
- d- Horse fly has Relationship with man as.....
- e- Phytophagous insects are, while entomophagous plants are.....
- f- The relation between Ants and Acacia plant is an ideal example for..... relationship, where
- g- Parental care is a relation betweenwhere.....
- h- Cannibalism is.....
- i- Polyphagous insects are....., while oligophagous insects are
- j- The characters of insect pollinated flowers include.....

5. Compare between the following (15 marks, 5 for each)

- a- Parasitism & predation
- b- Symbiosis & Mutualism
- c- *Nepenthes* sp & *Drosophyllum* sp

6. Mention the degree of sociality in insects? (5 marks)?

7. Mention the types of biological transmission and give an example for each type? (5 marks)?

8. Explain briefly how insects can benefit humans? (5 marks)

Examiners: Prof. DR Amal seif, Prof. Dr. Yasser D. Dar, and Dr. Hanaa El-Brens



Answer the following questions:

Part I: Population ecology: (75 marks)

Q1. Choose the correct answer for each statement (12 marks, 2 each):

- A. When individuals in a population reproduce at a constant rate, it is called (exponential growth - growth density - logistic growth - multiple growths).
- B. The (numerical – functional) response is an increase in the number of preys taken per predator at increasing prey density.
- C. (Polyphagous – Monophagous) exhibit inverse density dependence, wherein mortality declines as prey density increases.
- D. The mountain pine beetle moves northward into British Columbia because of (climate changes – competition – predation).
- E. R letter in R-strategists refers to (the rate of growth - random sampling).
- F. (Spatial – temporal) processes explain how a species is spread to new habitats.

Q2. State if the following statements are true or false (16 marks, 2 each):

- A. Moving individuals decrease genetic diversity as well as the size of a population.
- B. Stress from overcrowding is a density-independent factor.
- C. Sampling techniques change with habitats, nature of insect and stage.
- D. Allee effect is caused primarily by the success of individuals to find mates and reproduce.
- E. K-selected species slowly reach the carrying capacity and then stay there.
- F. Logistic population growth model fits data from laboratory colony of fruit flies.
- G. The number of parasitoids in the next generation P_{t+1} is given by $N_{t+1} = \lambda_t f(N_t P_t)$.
- H. Relative measures express numbers per unit area or volume of habitat.

Q3. Fill in the blanks with the appropriate words (16 marks, 2 each):

- A. are smaller, fragmented parts of a larger overall population.
- B. A competitive exclusion means
- C. When resources are limited, competition prevents the growth of a population beyond the carrying capacity of the habitat.
- D. is a density-dependent factor that limits a population as the density
- E. Population ecology deals with questions related to the density of
- F. The formula for the Mark-recapture method is
- G. has been introduced to many regions of the world and has outcompeted and excluded many native species.

Q4. Discuss with illustrations if possible the following items (31 marks):

- A. Temporal patterns of fluctuation.....(10 marks)
- B. Population models to study the effects of natural enemies on their prey.....(12 marks)
- C. The types of survivorship curves.....(9 marks)

Part II: Community ecology: (75 marks)

Q5. Put [T] for true statements and [F] for false sentence. Correct the false one (20 marks)

- A. Community is assemblage of interacting populations of different species living [] within a particular area or habitat.
- B. A species' fundamental niche is the niche potentially occupied by that species []
- C. Species diversity is dependent only on the total number of different species in [] the community.
- D. Growth of community refers to the succession of different types of animals in a [] new community.
- E. Hydrarch succession that takes place in a water body, like ponds or lake. []
- F. The 1st carnivore in a food chain represents the 3rd trophic level. []
- G. The longer food chain the greater available energy. []
- H. Species richness is the total number of different species in the community []
- I. Numerical dominance dependent on the size (biomass) of these individuals. []
- J. Pyramids of number uses biomass of all organisms at each trophic level. []

Q6. Give an account on the following:

[30 marks, 10 each]

- A. The emergent properties of a community.
- B. Classification of species according to their roles in a community.
- C. Components and functions of an ecosystem.

Q7. Distinguish between each pair of the following

[25 marks, 5 each]

- A. Niche and Habitat.
- B. Sympatric populations and allopatric populations.
- C. Primary succession & Secondary succession.
- D. Food chain & Food web.
- E. Qualitative similarity & Quantitative similarity.

😊 End of Exam 🙏 Best Wishes 🙏 Please Smile 😊

Examiners:	Dr Wesam Meshrif	Dr Mohamed Ageba
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