	<b>TANTA UNIVERSITY</b> <b>FACULTY OF SCIENCE</b> <b>DEPARTMENT OF CHEMISTRY</b>			
	<b>EXAMINATION FOR B. SC. STUDENTS</b>			
	<b>COURSE TITLE: LASER CHEMISTRY</b>			<b>COURSE CODE:</b> <b>CH4113</b>
<b>DATE:</b> 18 <sup>TH</sup> JANUARY 2023	<b>TERM:</b> FIRST 22-23	<b>TOTAL ASSESSMENT MARKS:</b> 50	<b>TIME:</b> 2 HOURS	

**Answer the following questions (10 marks each)**

- 1- Tunneling of small particles is an important phenomenon of many chemical applications. Discuss this phenomenon and its application to explain splitting in ammonia vibrational spectral lines, non-linear Arrhenius plots and deviation from kinetic isotope effect.
- 2- The application of molecular rigidity effect on fluorescence efficiency in salmonella detection, DNA quantification and fingerprint modification.
- 3- The technique of thermal lensing is an important application on laser collimation. Draw a time- resolved thermal lensing experimental setup and trace upon using the technique to study singlet oxygen sensitization kinetics.
- 4- Briefly describe each of the following:
  - (a) The technique of polarized fluorescence and its application in studying drug-protein interactions.
  - (b) The technique of single photon counting and its application in lifetime measurement.
  - (c) Laser applications in isotope separation
  - (d) The synthesis of vinyl chloride from 1,2-dichloroethane is an important multibillion industrial process demonstrating the advantages of laser applications. Write the reaction scheme and mention the advantages of laser application in comparison with thermal applications.
- 5 - Draw and label each of the following:
  - (a) Ground and the first two excited states in oxygen molecule giving the appropriate notations.
  - (b) Energy levels in He-Ne laser
  - (c) Energy levels in excimer lasers
  - (d) Energy levels in salicylamide as a proton transfer dye laser
  - (e) Energy levels in carbon dioxide lasers

Prof. Dr. El-Zeiny Mousa Ebeid and Prof. Dr. Samy Abdallah El-Daly



TANTA UNIVERSITY  
FACULTY OF SCIENCE  
DEPARTMENT OF ZOOLOGY

EXAMINATION FOR SENIORS (FOURTH YEAR) STUDENTS OF ENTOMOLOGY

COURSE TITLE:	Insect physiology		COURSE CODE: EN 4101	
DATE 2	JANUARY 2023	TERM: FIRST	TOTAL ASSESSMENT MARKS:150	TIME ALLOWED: 2 HOURS

**Answer the following questions: Notice! The examination consists of two pages.**

**I. Choose from between the brackets the correct answer (Total 60 Marks, 2 Mark each)**

- Cardiac and Smooth muscles found in insects.  
a) True b) False
- Muscles are attached to the body wall, with attachment ..... Running through the .....and to the..... where they can move different parts of the body including appendages such as wings.  
a) Fibers, cuticle, epicuticle b) Muscles, cuticle, epicuticle c) Filament, nucleus, myofibril
- Myofibril comprising a fine actin filament enclosed between a thin pair of myosin filaments slide past each other instigated by nerve impulses.  
a) True b) False
- Muscles of mouth parts classified into:  
a) Labral compressors, lateral muscles and the posterior labral muscles. b) Lateral and longitudinal muscles. c) Labral compressors and the posterior labral muscles.
- Lateral abdominal muscles  
a) Are special muscles concerned with the movement of the genitalia, cerci and spiracles.  
b) Acting together, the groups act as retractors by telescoping the abdomen.  
c) Running between dorsal and ventral surface of labrum.
- Alary muscles found  
a) In each side of the diaphragm. b) On the top of the dorsal diaphragm. c) In the bottom of the dorsal diaphragm.
- Accessory pulsatile organs they are located in  
a) Antennae, long mouth parts, legs, wings, and abdominal appendages. b) Antennae, legs and wings only. c) Antennae, long mouth parts, legs and wings except abdominal appendages.
- Mechanism wing movement and most of flight is controlled by .....muscles. They are called this because the longitudinal and dorsoventral muscles do not connect directly to the wing but control flight by affecting the dorsal surface of the thorax.  
a) Direct flight b) Indirect flight c) No answer to the above
- Cephalic muscles of head divided into  
a) Labral compressors and the posterior labral muscles. b) Cervical and Labral compressors muscles  
c) Cervical, Labral compressors and the posterior labral muscles.



10. The skeletal muscles of insects consist of :
- Synchronous skeletal muscles
  - A Synchronous skeletal muscles
  - The both
11. The posterior labral muscles
- Run from normal sclerites of labrum to the wall of head.
  - Running between dorsal and ventral surface of labrum.
  - Aid the dorsal diaphragm in providing support for the heart.
12. Longitudinal abdominal muscles divided into:
- Tegral and sternal longitudinal muscles.
  - Alary and visceral muscles.
  - Sternal and visceral muscles.
13. Movement of viscera that is the function of
- Nervous system
  - Muscular system
  - Digestive system
14. The only muscle type found in insects is striated muscle. Insects do not have cardiac or smooth muscle types.
- True
  - False
15. In the indirect flight
- Contraction of the longitudinal muscles causes an arching of the notum and the wings go down.
  - Relaxation of the longitudinal muscles causes an arching of the notum and the wings go down.
  - Contraction of the longitudinal muscles causes an arching of the notum and the wings go up.
16. An insect's nervous system is a network of specialized cells called
- Neurons
  - Glial cells
  - Axons
17. Multipolar neuron
- Have many projections extending from the axon.
  - Have two projections extending from the axon
  - Have many projections extending from the soma
18. Afferent (sensory) neurons
- Unipolar cells that form connections between afferent and afferent neurons and conduct signals within (CNS).
  - Bipolar or multipolar cells that conduct signals away from (CNS) and stimulate responses in muscles and glands.
  - Bipolar or multipolar cells have dendrites that are associated with sense organs. They carry information towards the (CNS).
19. Synapsis
- It is the point which neurons send information to other cells.
  - It is the point which neurons receive information from or transfer it to other cells.
  - It is the point which neurons send information from or transfer it to other cells.
20. Glial cells
- They pass nutrient materials to the neuron.
  - A nerve is simply a bundle of dendrites or axons that serve the same part of the body.
  - They promote direct axonal growth if peripheral injury occurs.
21. Types of insect ganglia are
- Sub-esophageal ganglia, ventral nerve cord and segmental nerves.
  - Sub-esophageal ganglia, two Thoracic ganglia and abdominal ganglia.
  - Sub-esophageal ganglia, three Thoracic ganglia and abdominal ganglia.



22. Brain is subdivided into

- a) Protocerebrum, Deutocerebrum and Tritocerebrum. b) Protocerebral lobes, optic lobes and opticon.
- c) Lamina, Medulla and Lobula.

23. Antennary nerves

- a) Issue from antennary lobes (motor nerves of appendages). b) Sensory and motor; one from the antennary and the other from the dorsal lobe. c) Arising from dorsal lobes to vertex.

24. Tegumentary nerves arising from

- a) Protocerebrum. b) Tritocerebrum. c) Deutocerebrum.

25. Function of Sub-esophageal ganglia

- a) It may influence the motor activity of the entire insect. b) A pair of nerves supply the general muscles. c) A pair innervates muscles of legs.

26. Stomodaeal Nervous System

- a) This ganglion innervates the pharynx and muscles associated with swallowing. b) It contains the motor centers for the mouth parts which it innervates. c) A pair innervates muscles of legs.

27. Protocerebral lobes

- a) The principle feather are the protocerebral bridge, the central body and lateral accessory lobes.
- b) They are connected with the ganglion plate by outer chiasma.
- c) They are connected to the medulla externa by inner chiasma.

28. Higher Diptera, Homoptera consist of

- a) Suboesophageal, single compound thoracic and abdominal ganglion. b) Suboesophageal and all the ventral ganglion are fused. c) Single compound thoracic and all the ventral ganglion are fused.

29. Tegumentary nerves arising from

- a) Dorsal lobes to vertex. b) Hypocerebral ganglion. c) Antennary and Accessory antennal nerves

30. The medulla externa "epiopticon"

- a) They are connected with ganglion plate by inner chiasma. b) They are connected with ganglion plate by outer chiasma. c) They are connected with ganglion plate and medulla externa.

**2. Indicate whether the following statements are true (T) or false (F): (Total: 15 Marks)**

1. Outer cell layer of epidermis formed of multisquamous cells.
2. Formation of abasal extra cellular matrix, basmant membrane, which effectively seperateds integument from epicuticale
3. Epidermal cells defferentiated into specialized glandular cells in the form multicellular and have short duct.
4. The epidermal glandular cells in the form multicellular and have short duct.
5. Gland cells no exhibit cyclic activity associated with new cuticle production

6. the basal plasma membrane contains neutral mucopoly acids which secreted by haemocytes
7. cuticle secreted across apical membrane of epidermal cells
8. the cuticle composed of epicuticle, hypodermis and endodermis
9. in some insects, the fourth layer called the epicuticle is found between the exocuticle and endocuticle
10. epicuticle is multilayers structure divided into three layers of varying thickness depending on insect species
11. the procuticle consist of sugar and lipids
12. the canals of procuticle contain tubular filaments called canal filament arising from epidermal cells
13. non cellular process composed of cuticle and may have several forms
14. scales are highly modified from hairs
15. spurs differ from setae in being unicellular in origin

**3. Write short note on each of the following (Total 75 Marks):**

- a. The Heartbeat diagram of insect.
- b. Balance of salts at saltwater insects.
- c. Respiration in endoparasitic insects.
- d. Plasma composition of nitrogen degradation products.
- e. The most types of hemocyte at insects and its functions.
- f. Redox potential in digestion of insect.
- g. Extra-intestinal digestion of some insects.
- h. Cellular immune responses at Locust.

**Good Luck**

<b>EXAMINERS</b>	<b>PROF. AFAF M. EL-ATTRISH</b>	<b>PROF. SOMIA A. HALIM</b>	<b>DR. M. SHAHEN</b>
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1969	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF ZOOLOGY		
	EXAMINATION FOR FORTH YEAR (SENIORS) STUDENTS OF ENTOMOLOGY		
	COURSE TITLE:	Insect behavior	COURSE CODE: <sup>EN</sup> 74103
DATE:	JAN,2023	TERM: FIRST	TOTAL ASSESSMENT MARKS:60
			TIME ALLOWED: 3 HOURS

**I. First group of questions (Total 30 Marks)**

**1. Choose from between the brackets the correct answer (Total: 4 Marks, 2 each )**

- a. The use of a tool to perform some task is considered as example of (trial and error-habituation- latent-insight) learning behavior.
- b. The very sudden disappearance of winged insects in an area where they were known to be present previously is an evidence of (sudden death -trivial flight- migration).

**2. Correct the following statements: (Total: 8 Marks, 2 each)**

- a. All species of dragon flies make regular transoceanic migrations.
- b. The honey bee learns to recognize the features of its home locality by habituation.
- c. Day-flying predators and flower and leaf eating insects rely to a large extent on sent, while crepuscular and nocturnal forms depend on vision to find their food or mate.
- d. High wind speed promote take off of insects.

**3. Fill in the blanks with the appropriate words (Total: 8Marks, 2 each)**

- a. The initial inability of insects to fly is related to.....and.....
- b. Flight activity is divided into.....and.....
- c. The types of insect migration are.....
- d. The longest flights made by *Schistocerca* occur at.....

**4. write short note on each of the following: (Total: 10 Marks, 2 each)**

- a. Migration of the monarch butterfly.
- b. Latent learning of insects.
- c. External factors limiting flight activity of insects.
- d. Trivial flights.
- e. Evidences of insect migration.

**II. Second group of questions (Total 30 Marks)**

**1. Correct each of following sentences with correct words (10 marks, 2 marks each)**

- a. The time sense of the honey bee, combined with the capacity for steering by the sun or the pattern of polarized light in the blue sky is the **latent learning**.
- b. The response to temperature may be **chemoklinotaxis** while the response to smell may be **orthokinetic**, or tropotactic.
- c. **Conditioned behavior** is the inborn patterns of movements, brought into operation by some appropriate condition.
- d. **Tropotaxis** is the orientation of the insects that orientate themselves to a bright point of light and maintain a Constant visual pattern.
- e. **Diurnal rhythm** is seen in the emergence of insects from the pupa or in moulting or hatching from the egg.

2. Complete the following sentences with suitable words (8 marks, 2 Marks each)

- a. .... is the direction of the organism in space in response to external stimuli.
- b. Gregarious parasitoids encountering unparasitized host produce .....sex ratio.
- c. In insects with compound eyes the orientation to light would be an example of .....
- d. ....is the direction of the movement that not precisely related with the direction of the source of stimulus.

3. Give short account on each of the followings (12marks, 4 each)

- a. Host location and oviposition on plants.
- b. Host selection of parasitoids.
- c. Co-ordinated behaviour

**GOOD LUCK!**

**EXAMINER**

**DR.MERVAT ABOU SEADA**





TANTA UNIVERSITY  
FACULTY OF SCIENCE  
DEPARTMENT OF ZOOLOGY

EXAMINATION for fourth Year students OF Entomology

COURSE TITLE:	Insect Pheromones		COURSE CODE:EN4105
DATE:9/1	JAN 2023	FIRST TERM	TOTAL ASSESSMENT MARKS:100
TIME : 2 HOURS			

(يتكون الامتحان من صفتين)

**1- Indicate whether the following statements are true or false (Total: 20 marks)**

1. Pheromones produced by various endodermal glands ( )
2. Dust organs consist of groups of eversible or erectile hair scales, which provide a quick-release mechanism for scent or scented particles. ( )
3. Brush organs consist of folded areas along wing edge, packed with articulation scales ( )
4. Antennae are major organs for pheromones, semiochemicals and different odors perception. ( )
5. In some insects, pheromones are ingested by the recipient. ( )
6. Releaser pheromones are chemical odors that induce an immediate behavioral reaction in the receiver. ( )
7. In adults Pentatomidae, the source of the defense compounds is the dorsal abdominal glands, while in nymphs it is the metathoracic gland ( )
8. Trichogencell envelops the ORN and secretes dendritic sheath. ( )
9. Alarm pheromones are generally high molecular weight, not dispersing quickly, and persist in the environment. ( )
10. Thecogen and tormogen cells form the shaft and socket of sensillum. ( )

**2- Complete the following sentences with missed words (Total: 30 marks)**

1. Chemosensilla grouped in two categories:.....and .....
2. Thick-walled chemosensory hairs have.....,.....,.....,and.....
3. ....perform both storage and release functions of pheromones, being charged with scent by capillary action from a basal gland while retracted, and then rapidly diffusing scent by fanning out to give a large surface area.
4. .... very fine scent scales, annulated so that they break up into myriads of dust-like particles, which scattered over females during courtship.
5. .... a patch of specialized androconial scent scales in discrete areas of male forewing that helps disperse pheromones emitted from tiny organs on wings.
6. Androconia scales either scattered or frequently grouped together, and may thus form conspicuous structures divided into.....,.....,....., and.....
7. Two ways for insects to detect chemical signals in their environment by 1).....and 2).....
8. ....are basiconic pegs set in deep pits innervated by two to several neurons, the surface opening is often much narrower (flask-shaped) than that of coeloconic sensilla.



9. ....Roundish, plate-like, or domed slightly raised above, or depressed below surface cuticle.
10. Three types of accessory supporting cells surround cell bodies of ORNs.....,..... and.....

**3- Answer the following questions (Total: 50 Marks)**

- 1- Describe the Site of pheromone biosynthesis in Coleoptera(5 Marks)
- 2- Discuss the trail pheromones in honey bee and cockroaches(5 Marks)
- 3-Discuss the Insect odor perception in ORNs (5 Marks)
- 4- Discuss the sex pheromone in Lepidoptera (10 Marks)
- 5-Discuss alarm pheromones of honey bee (10 Marks)
- 6-Discuss aggregation pheromones in insects (15 Marks)

*Good Luck!*

EXAMINERS	PROF.DR. AMAL SEIF	PROF.DR. MERVAT ABOU SEADA
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TANTA UNIVERSITY  
FACULTY OF SCIENCE  
ZOOLOGY DEPARTMENT

Final Exam. For 4<sup>th</sup> level, Special Entomology Students, 1<sup>st</sup> Semester

Course title: Insect transmission of Plant Pathogens Course code: EN4111

Day & Date: Saturday, 21/1/2023 Total assessment: 100 Marks Time Period: 10 AM – 12 PM

Examiners: Prof. Yasser D. Dar, and Dr. Hanaa El-Brense

**Note: The exam in two pages**

**1) Give a short account on the followings: (25 marks, 5 marks each)**

- 2) Importance of insects in transmission of plant diseases.
- 3) A plant disease carried by phloem-inhabiting bacteria.
- 4) Transmission of mollicutes to plants by Insects
- 5) Bacterial wilt of corn.
- 6) Aster yellows disease.

**1) Complete the following sentences: (15 marks)**

- a) Insects can transmit pathogens to plants by: 1. ...., 2. ...., 3. ...., & 4. ....
- b) ..... can transmit potato blackleg disease, the symptoms of this disease include .....
- c) *Erwinia tracheiphila* causing wilt of cucumber can survive in intestine of 2 vectors: ..... and .....
- d) Apple proliferation is transmitted by ....., and its symptoms include ..... and .....
- e) *Psylla pyricola* is the vector of ..... disease, which is caused by .....
- f) Corn stunt disease is transmitted ....., which inhabit the ..... of corn.

**2) Choose the correct answer: (10 marks, 1 mark each)**

- 1) Insects transmitting xylem-inhabiting bacteria are ..... for the pathogen.  
a) externally specific b) externally non-specific c) internally specific d) internally non-specific
- 2) Bacterial soft rots is a disease caused by .....  
a) *Erwinia carotovora* b) *Erwinia tracheiphila* c) *Erwinia amylovora* d) *Pantoea stewartia*
- 3) Sharpshooter leafhopper are vector is the vector of .....  
a) olive knot b) fire blight c) aster yellows d) Pierce's disease of grape
- 4) Galls formation developing on the plant is a sign of ..... disease.  
a) plant wilt b) soft rot c) fire blight d) olive knot
- 5) Fire blight is a bacterial disease that can affect .....  
a) corn b) cucumber c) apple d) pepper



6) One of the following is a plant disease caused by xylem-inhabiting bacteria

- a) citrus greening      b) citrus stubborn      c) yellow vin disease      d) wilt of cucurbit

7) Cucurbit yellow vine disease is a bacterial disease transmitted by the .....

- a) squash bug      b) olive fly      c) citrus psyllid      d) leafhopper

8) Tomato big bud disease can be transmitted by .....

- a) Sharpshooter leafhoppers      b) *Psylla* sp.      c) brown leafhopper      d) aster leafhopper

9) Stunted infected trees, small, lopsided fruits are symptoms of ..... disease

- a) citrus greening      b) corn stunt      c) wilt of corn      d) citrus stubborn

10) The following plant diseases are caused by mollicutes EXCEPT .....

- a) apple proliferation      b) aster yellows      c) tomato big buds      d) citrus greening

**4. Explain in details the following plant diseases referring to the symptoms of each (30 marks, each 6 marks)**

- a- Powdery mildew
- b- Gray mold of grapes
- c- Ergot of cereals
- d- Potato leaf roll
- e- Flower spot of azalea

**5. Write true or false with correction the false sentences (20 marks, each 4 marks)**

- a- The color of spores of rust disease fungus is brown ( )
- b- Anther smut of carnations caused by *Ustilago violacea* ( )
- c- Endosepsis of fig is a bacterial disease ( )
- d- Phloem necrosis of coffee caused by the protozoa of *Phytophthora* ( )
- e- Stink bug is the vector of heart rot of coconut palms ( )

	<b>TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF ZOOLOGY</b>		
	<b>PRACTICAL EXAMINATION FOR JUNIORS (FORTH YEAR) STUDENTS OF BIOLOGY</b>		
	<b>COURSE TITLE:</b>	<b>Entomology Seminars</b>	<b>CODE:EN4113</b>
<b>2023</b>	<b>25 JAN 2023</b>		<b>TIME ALLOWED: 2HOURS</b>

**Discuss the following items:**


- 1-Toxicity of nanoparticles on insects
- 2-Effects of Simulated Heat Waves on Life History  
Traits of a Host Feeding Parasitoid
- 3-The role of insect neuroendocrine system in the  
response to cold stress
- 4-Types of insect compound eyes
- 5-Main components of insect optic lobes
- 6-Position and function of optic chiasmms within insect  
compound eyes.
- 7-How can insects see?

**GOOD LUCK**

**Examiner:**

**Prof.Dr.Samar El Kholy**



	<b>TANTA UNIVERSITY</b> <b>FACULTY OF SCIENCE</b> <b>DEPARTMENT OF ZOOLOGY</b>		
	<b>FINAL EXAMINATION FOR SENIOUR STUDENTS SPEIAL ENTOMOLOGY</b>		
	<b>COURSE TITLE:</b>	<b>Apiculture</b>	<b>COURSE CODE: EN4115</b>
<b>DATE:</b>	<b>4-1-2023</b>	<b>TOTAL MARKS: 100 MARKS</b>	<b>TIME ALLOWED: 2 HOURS</b>

**1-Choose the correct answer (20 marks each: 2.5 marks)**

- A- The carniolan bee related to (European –Oriental-African) races.
- B- The Hypopharyngeal glands of nurse worker bee secrete (pheromones-Royal jelly-Digestive enzyme).
- C- The age of queen is (16 days-3-5 years- 21 days).
- D- Sac brood diseases is (Bacterial- Viral- Protozoan) diseases.
- E- The causes of American foul brood disease is (*Aspregillusflavus- Bacillus larvae- Ascophoraapis*).
- F- *Acarapiswoodi* is (tracheal- thoracic-Abdominal) mites.
- G- Antibiotic Tetracycline control the (American foul brood-Paralysis-Mites) diseases.
- H- fertilized egg laid by queen grew to(drone-worker- queen or worker according to feeding).

**2- write a short notes on the following:(30 marks each 10 marks)**

A-Bacterial diseases of honey bee and its control.

B-Biology of honey bee colony. C:Requeening and wintering

**3- Discuss the following: (20 marks each 10 marks)**

A-Division of labor and factors effecting of honey bee colony.

B-Swarming and its control in honey bee colony.

**4- Mention the following:(30 marks each 10 marks)**

A- Mites and fungal disease and its control of honey colony.

B-The important of Beekeeping. C: Races of honey bee

**"good luck"**

***Prof Dr: Elsaied Ahmed Mohamed Naiem***