



Faculty of Science
Department of Zoology

Insect Morphology (242E)
Total degree: 50

Time: Two hours

.....
A-Give your essay in points with draw about only 5 of the following:
(25 marks)

- 1- The flight theory of an insect.
- 2- The thoracic- coxal joints and articulations.
- 3- The dorsal muscles of the mandibles of a Pterygot insect.
- 4- The general structure of the wing- bearing segments.
- 5- The various modification of the tentorium.
- 6- How does insect walk?

B-Complete 5 points only of the following: (10 marks)

- 1-Beside bearing the cranial walls, the tentorium gives attachments to the ventral adductor muscles of the.....,, and
- 2-In most insects the antennal muscles arise on the, particularly on the dorsal arms.
- 3-The opening from the head into the neck, usually called the
- 4-The basal musculature of the maxillae in all biting Pterygote insects include anterior and posterior
- 5-A stipital flexor of the lacinia is inserted on the of the
- 6-The tritocerebral ganglia are regarded as the of the

C- Identify only 5 of the following: (5marks)

Tentorium, Gnathocephalon, Gular suture, lacinia, Parietals, Hypopharynx.

D- Give the scientific name of the following:**(10marks)**

- 1-Is the top of the cranium between and behind the compound eyes.
 - 2- Gives attachment to certain muscles of the mandibles, maxillae , labium, and hypopharynx.
 - 3- The process in which the old skeleton is separated from the underlying epidermal cell.
 - 4- The appendicular organs of the procephalic region of the head.
 - 5- The inner endite lobe of a maxillae, provided with a muscle arising in the stipes, and with a second muscle arising on the cranial wall.
-

Have a good luck
AzzaAwad

University: Assiut

Invertebrate II

Total degree = 50

Faculty: Science

Code: 222 Z

Final exam. June 2015

Department: Zoology

Time: 2 hrs.



Answer the following questions: (Note: The questions are in 2 pages)

Q1. Give the term indicative of the following: (15 marks)

- 1-Blind, benthic and marine horseshoe shrimps.
- 2-System of 5 masticatory calcareous jaws and muscles.
- 3-Ectoparasitic arthropod develops within tantulus larva.
- 4-Striated ventral muscles close the appendage to its body.
- 5-A process of glycoprotein crosslinking to form rigid cuticle.
- 6-A fusion process for groups of segments into functional regions.
- 7-Anticlockwise rotation of veliger's visceral mass about 180 degrees.
- 8-Unique modified radula in prosobranchiate's proboscis used in preys attack.
- 9-A malacostracan possesses an asymmetrical abdomen concealed in an empty shell.
- 10-Adhesive ciliated knobs at the end of long tentacles extending from scaphopod's head.
- 11-Endoparasitic arthropods in the respiratory tract of vertebrates with 5 anterior holes.
- 12-A special structure of *Octopus* male that transfers sperms to the female's mantle cavity.
- 13-Unique hydraulic canal system function in locomotion, feeding, sense and gas exchange.
- 14-A caterpillar-like, velvet worm has many characteristics both annelids and arthropods.
- 15-A phylum can survive great extremes of temp., toxicity, acidity, salinity in water, air and land.

Look behind please!

Q2 Answer the following questions:**(20 marks)**

- 1- List the main characteristics of Onychophora.
- 2- Demonstrate the impact of arthropod's exoskeleton.
- 3- Classify Sub. Phylum Chelicerata and give an example for each.
- 4- Illustrate with drawings the digestion in both *Penaeus* & *Tripneustes*.
- 5- Only with drawings: Differentiate between the circulatory system in *Sepia* & *Anodonta*.

Q3. Choose between brackets:**(15 marks)**

- 1-(Epicuticle – Endocuticle - Exocuticle -All) is found at joints.
- 2-(*Conus* - *Iulus* - *Conch*) injects venom and can engulf prey whole.
- 3-(*Bulinus*-*Limulus*-*Sacculina*); an endoparasite with / interna and externa.
- 4-(Peristalsis-Jet propulsion-Creeping) is responsible for rapid movement in *Sepia*.
- 5-Animal chews when walks and is used in conch trapping(*Iulus*-*Limulus*-*Helix*)
- 6-(Ship-Velvet-Tongue) worms burrow through wood and have symbiotic bacteria.
- 7-(Parthenogenesis–internal fertilization-external fertilization) occurs in *Asteropectin*.
- 8-Walking on multi-articulate foot with numerous hairs (*Scolopendra*-*Scutigera* -*Iulus*).
- 9-Ectoparasitic crustacean;(*Argas*-*Jolia*-*Argulus*) with 4 pairs of legs and suckoral discs.
- 10-(Aeolids – Dorides- Sacoglossans) have functional nematocysts at the tips of the cerata.
- 11-In (Anhydrobiosis-Cryobiosis–Tun-All) animal can survive desiccated for a long period.
- 12-(Pycnogonids- Merostomates- Tardigrades) are benthic chelicerates with proboscis and long legs.
- 13-(Bivalves- Thecosomes- Sand dollars) feed by trapping plankton in mucous web over them.
- 14-Non-feeding (cypris-trochophore-nauplius) larva, with 3 pairs of appendages and swim freely.
- 15-(Tardigrades- Onychophores-Mites) exist in ice, hot springs, on top Himalayas, under high radiation.

Part I – Histology

I- Choose the most appropriate answer for each of the following statements:(10 Marks)

- 1- The simple squamous epithelium that lines the abdominal cavity is called:
a. Epithelioid tissue b. Mesothelium c. Endothelium
d. Transitional e. Pseudostratified
- 2- What is a gland called if it has an unbranched duct?
a. Simple gland b. Compound gland c. Tubular
d. Alveolar e. Tubuloalveolar
- 3- Which cell type forms the major connective tissue component of lymphoid tissues and organs?
a. Primary spermatocytes b- Mast cell
c- Eosinophil d- Reticular cell
- 4- According to the mode of secretion (changes in the secretory cells), glands are classified into:
a- Exocrine and endocrine b- Merocrine, apocrine and holocrine
c- Unicellular and multicellular
- 5- What type of epithelium appears stratified, but it is not?
a- Epithelioid tissue b- Mesothelium c- Endothelium
d- Transitional e- Pseudostratified
- 6- Which cell type forms the myelin sheath around myelinated axons in the central nervous system?
a- Ependymal cell b- Oligodendrocyte c- Schwan cell d- Microglial cell
- 7- Which fiber type has more myoglobin?
a- Red fibers b- White fibers c- Intermediate fibers
d- All of the above e- None of the above

Look at the back of the page for the rest of the exam

- 10- Which of the following is a supporting cell found in the ganglia?
a- Schwan cell

II- Mention whether each of the following statements is True (T) or False (F): (10 Marks)

SN	Statement	T or F
1.	Ependymal cells tend to be simple ciliated cuboidal/columnar and line the ventricles of the brain	
2.	Collagen is secreted by fibroblasts as procollagen molecules	
3.	Smooth muscle cells have single nuclei	
4.	In a neuron, the smooth endoplasmic reticulum is termed Nissl granules	
5.	Microvilli increase the surface area of the epithelia cells	
6.	Fibroblasts have an oval shaped nucleus with a distinct nucleolus, basophilic cytoplasm and synthesize components that make up collagen	
7.	Mast cells which are widely distributed in the connective tissue, can release histamine and/or heparin. The latter serves as an anticoagulant	
8.	Osteoclasts are multinucleated cells that secrete lysosomes and are responsible for bone resorption	
9.	All glia arise from the embryonic ectodermal layer	
10.	Exocrine secretion goes into blood stream	

III. Compare between: (Answer only ONE of the followings). (5 Marks)

- 1- Cartilage and bone
- 2- Skeletal, smooth and cardiac muscle

Look at the back for the rest of the exam

Part II - Histopathology

IV. Choose the correct statement from column B that matches the terms in column A (15 Marks)

A		B									
1. Pyknosis		1. Pathological accumulation of excess neutral fat in parenchymatous cells									
2. Cloudy swelling		2. The nucleus break up into multiple small fragments									
3. Karyorrhexis		3. Characterized by excess water accumulation inside the cells forming vacuoles in the cytoplasm									
4. Hyperplasia		4. A local death of cells or tissues within living body caused by severe physical and chemical insult									
5. Karyolysis		5. Characterized by swelling of the cell and granularity of the cytoplasm									
6. Oedema		6. In which the nucleus shrinks, its chromatin becomes dense and it stains darkly									
7. Fatty changes		7. Pathological accumulation of excess fluids in the interstitial tissue spaces									
8. Hydropic degeneration		8. The nucleus appears to dissolve and fails to take the stain due to chromatic hydrolysis									
9. Necrosis		9. Reduction in the size of cells									
10. Atrophy		10. Increase in the number of cells									
Column A	1	2	3	4	5	6	7	8	9	10	
Column B											

V. Complete the following statements. (10 Marks)

1. Inflammation is defined as

.....

2. Causes of inflammation are:

- a)
- b)
- c)

3. Types of inflammation include:

- a)
- b)
- c)

Prof. Bothaina Mohamed Khidr

Best wishes



Answer the following questions with Labeled drawing if they needed

1- Put ✓ or X in front of following sentences and correct the wrong one:- (5 degree)

- 1- Melanophores are chromatophores containing no pigment ()
- 1- In hyostylic suspension, the upper jaw not firmly attached to neurocranium ()
- 2- Concentration of solutes in marine systems equals < 3 ppt salinity ()
- 3- Semelparous fishes spawn once during lifetime ()
- 4- Copulation is one of accessory characters of gonochoristic individuals ()

2- Give a short note about Five Only from the following (12.5 degree)

- 1- Indeterminate growth in fish
- 2- The branchiocranium
- 3- Chloride cell function in marine fishes.
- 4- Catadromous spawning migration
- 5- How fish resist environmental pressure?
- 6- Larval stages of fishes.
- 7- Color in fishes.

3- Define Ten only from the following: (10 degree)

- | | |
|-----------------------------|----------------------------|
| 1- Standard length | 7- Mimicry |
| 2- Bioenergetic equation | 8- Sexual dimorphism |
| 3- Stenohaline fishes | 9- Homeostasis |
| 4- Growth in fishes | 10- The cycle of migration |
| 5- Fecundity | 11- Pelagic spawning |
| 6- Gonochoristic individual | 12- Feminization |

4- Answer Five only of following themes: (12.5 degree)

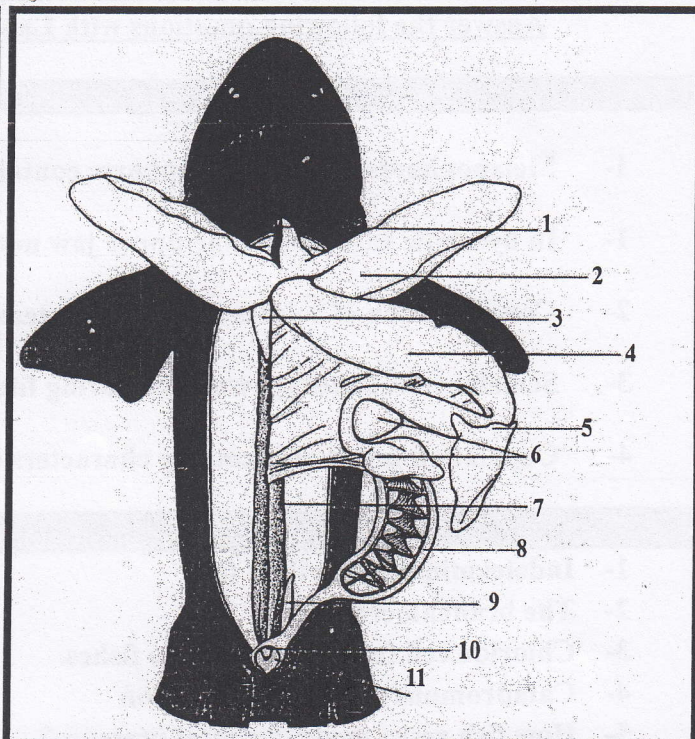
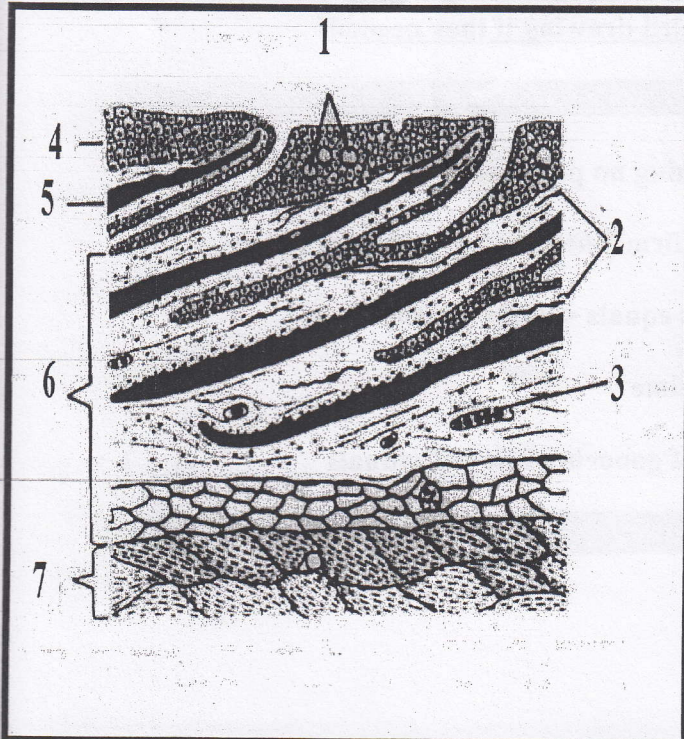
- 1- Classification of fishes according to their food and feeding habits.
- 2- If you think that you have a new fish species for a region, how you identify it?
- 3- Diagrammatically shows the structure of the chloride cell in fishes.
- 5- Diagrammatically shows the different types of scales in fishes.
- 6- Explain the Egg and larvae osmoregulation.
- 7- Compare between Mass and Polyandrous spawning.
- 8- Significance of sound in fishes.

5- Define and label each of the following items:

(10 degree)

1-.....

2-.....



With my best wishes.....



ZOOLOGY DEPARTMENT
FACULTY OF SCIENCE
ASSIUT UNIVERSITY
General Entomology (Z 240)



(الأسئلة في ٨ صفحات)

قسم علم الحيوان
كلية العلوم - جامعة أسيوط

Semester exam

10th June. 2015

Time Allowed: 2 hours

Answer the Following Questions

I-Complete the following sentences: (15 marks)

1- The following are among the benefits of insects:

- (a)
(b)
(c)

2- Insects can respire either by, or through

3- Insect thorax composed of three segments; an anterior segment is called, the middle is, and the posterior segment is the

4- Among characteristics that make insects successful and widely spread are:

- (a)
(b)
(c)
(d)

5- Insect Integument is composed of three main components:

- (a) (b) (c)

6- Chemically; procuticle is composed of and

7- Insect molting cycle passes 3 stages which are:

- (a) (b) (c)

8- Among hormones that affect molting process:

- (a) hormone. (b) hormone.
(c) hormone.

9- Insect head capsule is composed of 6 fused segments, the 3rd is called segment, that bears the fused ganglia which called

- 10- In insect head capsule the anterior tentorial pits lies at suture while the posterior tentorial pits lies at suture.
- 11- Haustellate mouthparts include the following types:
 (a) (b) (c)
- 12- In hemimetabolous insects, the tentorium is consisted of and
- 13- Insect legs can attach to thoracic segments through articulation or articulation.
- 14- Insect wing have three margins and three angles, the three angles are:
 (a) (b) (c)
- 15- The following are among the insect wing-coupling apparatuses:
 (a) (b) (c)
- 16- Halter wing of *Diptera* exist at thoracic segment.
- 17- The cerci, articulates laterally on abdominal segment number Cerci function as
- 18- The three main regions of an insect alimentary canal are the, the, and
- 19- Hypopharynx splits the preoral cavity into dorsal chamber and ventral
- 20- In plant-feeding insects the highly alkaline pH value of midgut is for
- 21- The space between epithelial cells and the peritrophic membrane in insect midgut is called space.
- 22- Types of respiratory systems according to the number and position of functional spiracles are:
 (a) (b) (c)
- 23- Insect central nervous system contains 3 ganglionic centers which are:
 (a) (b) (c)

24- Insect sympathetic nervous system is composed of:

(a) (b) (c)

II- Give the scientific name for the following: (6 marks)

1- Processes arise from epidermal cells run throughout the cuticle and end at the surface of the cuticle just below the epicuticle.

The answer is:

2- The detachment of the epidermis from the old cuticle.

The answer is:

3- Process of darkening of exocuticle that usually following sclerotization.

The answer is:

4- They are lipid-filled channels running from the tips of the pore canals to the outer surface of the epicuticle.

The answer is:

5- In this type of insect head, the long axis of the head capsule is at right angle with body axis.

The answer is:

6- Appendages of the abdominal segments 8 -11.

The answer is:

7- Muscular pumps; pumping hemolymph into the antennae, wings, and legs.

The answer is:

8- Ectodermal outgrowths of the alimentary canal formed of a single layer of cells surrounding a blind-ending lumen.

The answer is:

9- The maintenance the favorable composition of body fluids.

The answer is:

10- A type of cells found in the hindgut of aquatic insects, able to absorb inorganic ions from much diluted solutions

The answer is:

11- Obtaining oxygen from the environment and eliminate carbon dioxide respired by cells.

The answer is:

12- In this subtype of respiratory system; all spiracles are functional except the spiracle of the 3rd thoracic segment.

The answer is:

III- Mention three functions of 4 of the following: (6 marks)

1- Functions of the Integument:

(a)

(b)

(c)

2- The tentorium functions:

(a)

(b)

(c)

3- Hemocytes functions are:

(a)

(b)

(c)

4- Air sac functions are:

(a)

(b)

(c)

5- Functions of corpus pedunculata:

(a)

(b)

(c)

IV- Choose the correct answer: (6.5 marks)

1- Epicuticle is one of the three primary layers of insect cuticle, Epicuticle comprises the:

(a) Upper layer.

(b) Middle layer.

(c) Outer layer.

- 2- Chitin of insect integument can be found in the:
 (a) Procuticle. (b) Epicuticle. (c) Cuticulin envelope
- 3- Deposition of the wax layer of the epicuticle begins:
 (a) Just prior to ecdysis. (b) At the time of ecdysis. (c) After ecdysis.
- 4- In maxillae of chewing mouthparts, the proximal part of cardo attached to:
 (a) Stipes. (b) Lacina. (c) Galea. (d) Non of the previous.
- 5- In insect running legs, tibia attached to femur through:
 (a) Monocondylic aritulation. (b) Dicondyllic articulation. (c) Fixed articulation.
- 6- In honey bee leg modifications occur in:
 (a) 1st and 2nd legs. (b) 2nd and 3rd legs. (c) 1st and 3rd legs. (d) 3rd leg only.
- 7- In lepidopteran insects you can find scaly wing as:
 (a) Fore wing. (b) Hind wing. (c) Both fore wing and hind wing.
- 8- Rectum is originated from a germ layer called:
 (a) Ectoderm. (b) Mesoderm. (c) Endoderm. (d) Non of the previous.
- 9- The direction of Hemolymph movement in the perivisceral sinus is from:
 (a) Anterior to posterior. (b) Posterior to anterior. (c) No specific direction.
- 10- Excretion in insects is carried out mainly by:
 (a) Hindgut. (b) Malpighian tubules. (c) Both a and b.
- 11- Nymphs of aquatic insect respire using:
 (a) Branchiae. (b) Tracheal system. (c) Integument. (d) Non of the previous.
- 12- The following ganglia belong to the sympathetic nervous system:
 (a) Abdominal ganglia. (b) Frontal ganglion. (c) Sub esophageal ganglion.
- 13- The Neurosecretory cells are:
 (a) Nerve cells only. (b) Endocrine cells only. (c) Both a and b. (d) Non of the previous.

V- Mark (✓) for the correct answers and (X) for the incorrect ones and make corrections (if present) for the underlined statement: (4 marks)

- 1- Cuticulin envelope extends over the entire body surface and ectodermal invaginations including tracheoles. ()

The correction:

2- In chewing mouthparts both of glossa and paraglossa attached to postmentum. ()

The correction:

3- Flexion lines of wings along which the wing can be folded. ()

The correction:

4- In blood-feeding insects, salivary glands secrete saliva. ()

The correction:

5- In Lepidoptera, the labial (salivary) glands secrete the saliva. ()

The correction:

6- Spiracles never exist in the head region of an insect. ()

The correction:

7- Tracheoles are fine branches of tracheae each of 1 μ m or less. ()

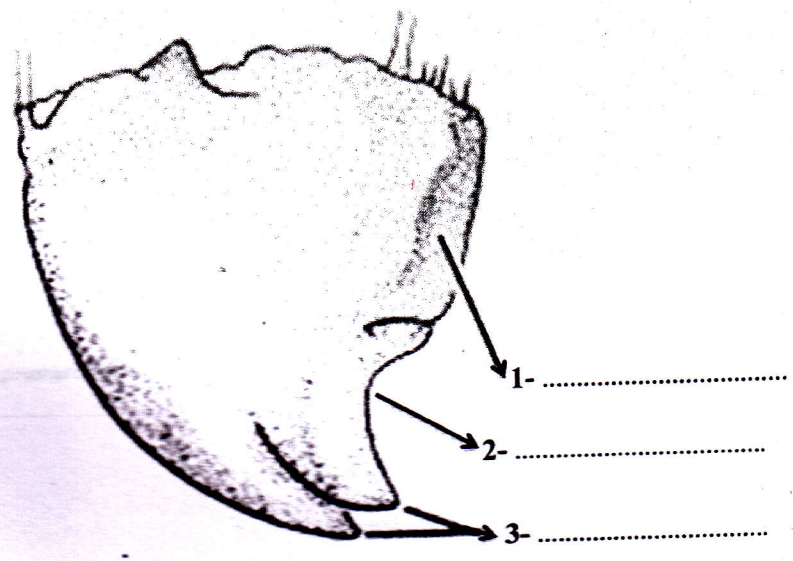
The correction:

8- Sensory neurons carry impulses from the central nervous system to muscles. (X)

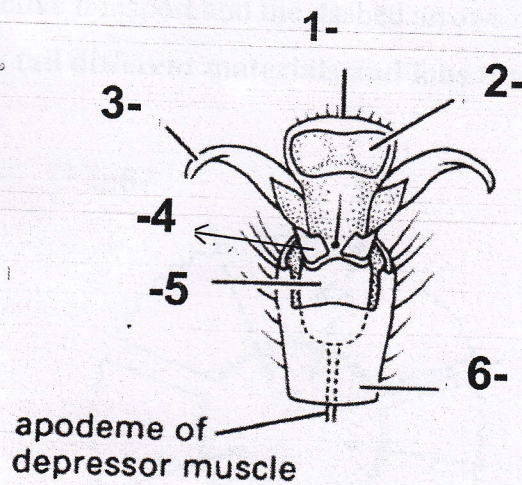
The correction:

VI- Identify the following figures and write down the missing labels: (12.5 Marks)
(1 Mark)

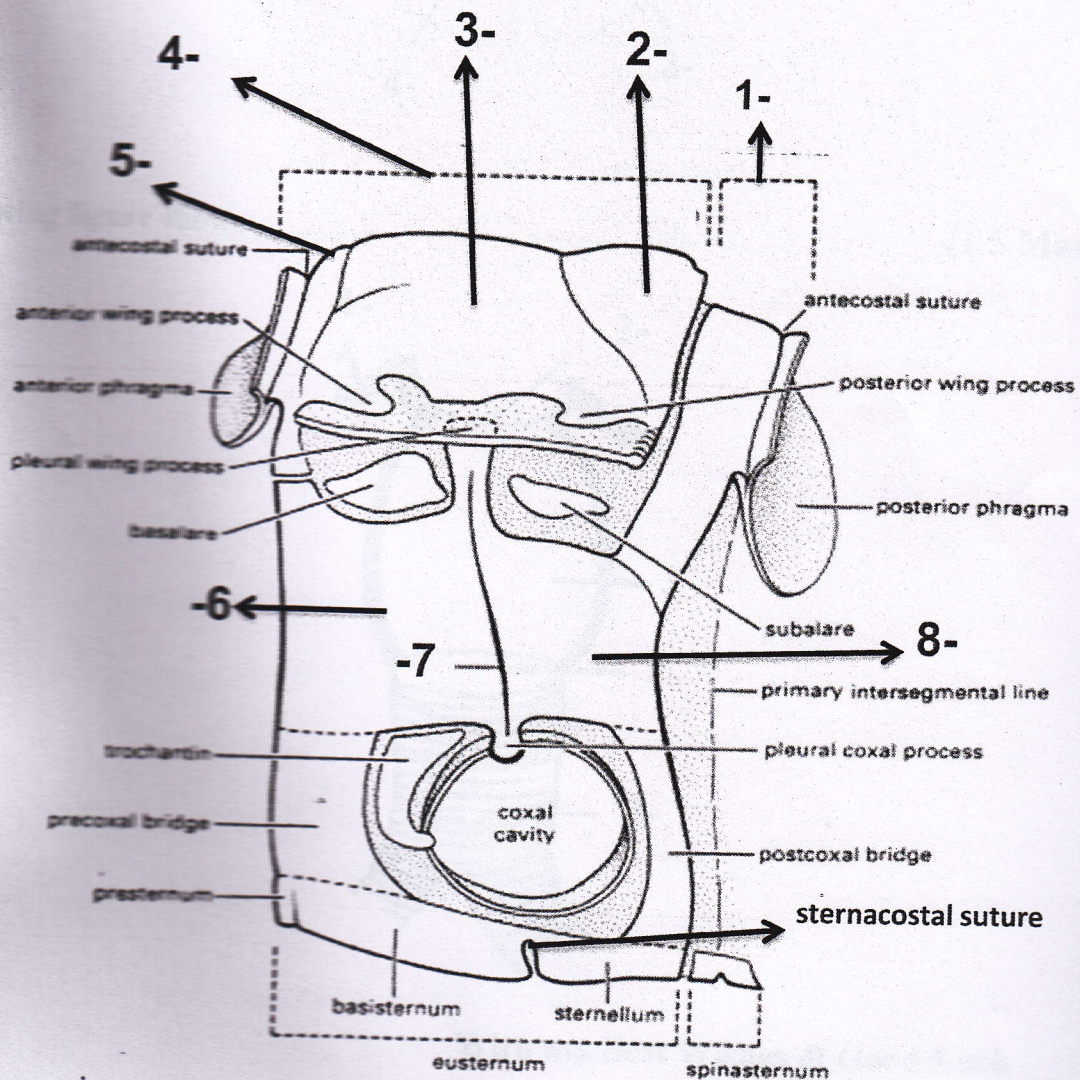
1- This figure shows:
.....



2- This figure shows: (3 Marks)



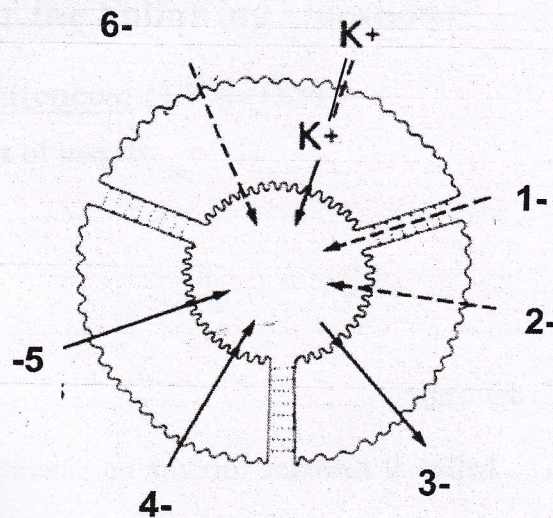
3- Write down the missing labels of the following wing-bearing thoracic segment. (4 Marks)



4- The following figure shows transport of filtrate through the Malpighian tubules of the locust.

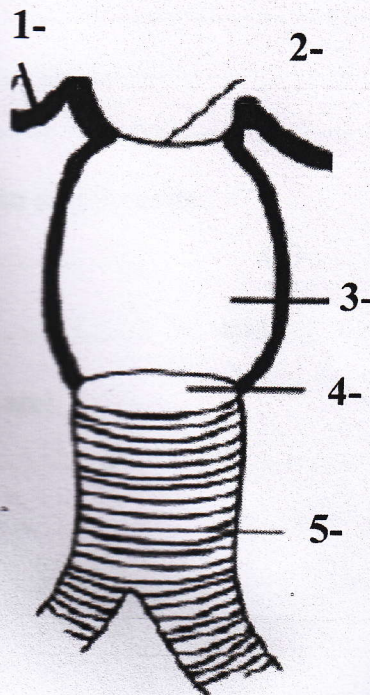
Solid arrows denote the active transport and the dashed arrows denote the passive transport.

* Write down at the arrow tail different materials and ions that pass actively or passively.
(3 Marks)



5- The following figure shows:

(1.5 Marks)



With my Best Wishes & Good Luck

Dr. Ahmed M. Korayem



قسم علم الحيوان - كلية العلوم
اختبار المستوى الثاني في مادة بيئة الحيوان ٢٢٥ ح
الزمن: ساعتان
عام ٢٠١٤ - ٢٠١٥



Answer the following questions:

1- Choose the suitable number from column (A) in Column (B):
(15 Marks):

1-The community	Is the main factor which controls the migration of birds ().
2-The ecosystem	Are the algae in the aquatic habitat ().
3- The limiting factor	Is killing and eating an individual of the same species ().
4- Range of tolerance	Are those which become active during night ().
5- Homeostasis	Are those which become active during day time ().
6-Monogamy	Is a relationship between two organisms in which one <u>benefits</u> and the other is harmed ().
7-Polyandry	The number of births in a given time period. ().
8-Birth rate	Species that sometimes regulate their body temperature and sometimes do not..... ().
9-Heterotherms	The formation of a pair bond between one male and one female ().
10-light	The individual female gains two or more males ().
11- The Producers	The range of the environmental conditions within which the organism can tolerate..... ().
12-Cannibalism	The maintenance of conditions within the range that the organism can tolerate. ().
13-Diurnal animals	Determines the types of organisms which may exist in that environment ()
14-Nocturnal animals	Includes all the communities plus physical environment ()
15-Parasitism	Is a collection of populations in a given area ().

إقلب الصفحة من فضلك

2- Choose the correct answer (10 Marks).

- 1- A desert community includes (plants-animals-microorganisms-all).
- 2- The biosphere includes all (species-communities- ecosystems) found in the earth.
- 3- The structural and functional unit studied in ecology is (The ecosystem- The population- The community- The species).
- 4-The biotic factors in the ecosystem includes (the non living factors- the living factors- all).
- 5-Light affects (the growth of glands in birds- deer reproduction- the behavior of animals –all).
- 6- Herbivorous animals belong to (Heterotrophs- Saprophytes- Producers).
- 7- The formation of a pair bond between one male and one female is called (Menogamy – Monogamy - Minogamy).
- 8- The number of births of a population in a given time period is called (Natality rate- Mortality rate- Density).
- 9- The absolute quantity of water vapor present in the air is called (Absolute humidity-Relative humidity-both).
- 10-A large number of young is characteristic of (long lived mammals- Species that reproduce only once in their life- Both).

3-Write the scientific Term of the following (10 Marks)

- 1- The maximum rate at which a population can increase under ideal conditions.
 - 2- The highest population that can be maintained for an indefinite period of time by a particular environment.
 - 3- The struggle between the individuals of the same species.
 - 4- The role played by the organism.
 - 5- An area defended by an organism not shared by another.
 - 6- A type of reproduction in which the ova must be fertilized to start development.
 - 7- A class of organisms found on the base of the food pyramid.
 - 8- The biome in which Egypt is found.
 - 9- Using a population to control another.
 - 10-A kind of distribution found in social insects.
-

4- Write the missing word or words in the following: (10 marks)

- 1- The three basic classes of organisms in a food web includes
.....,,
- 2-..... are the producers in the ecosystems which live in very deep water.
- 3-is a type of reproduction in which the ova not in need to be fertilized to develop.
- 4-.....is the eating of one living organism (prey) by another (predator).
- 5-.....is killing and eating an individual of the same species.
- 6-.....in the ecosystem include plants and animals.
- 7- Individuals are distributed..... if the position of each is independent of the other's.
- 8- is the number of individuals per unit of space.
- 9-..... is the number of individuals dying in a given time.
- 10-.....is the replacement of one kind of community with another.

5- Apply your knowledge to analyze some of the abiotic and biotic factors which you may find in the Nile River (5 marks)

With Best wishes



Assiut University
Faculty of Science
Dept. of Zoology

Final Exam. of Cytology (210Z) for Zoology Students

June 2015

Time 2 hours

الإمتحان في ثلاث ورقات

I- Choose the correct answer:

42 marks

- 1- In the prokaryotic cell, the division is a process called:
a) binary fission b) mitosis c) meiosis
- 2- Which one of the following statements concerning euchromatin is **TRUE**? a) not visible by the LM b) represents the metabolically inactive DNA. c) visible by the LM
- 3- The division of the nucleus separating the duplicated genome into two sets is known as:
a) mitosis b) cytokinesis c) cell division
- 4- Which one of the following statements about microvilli is **FALSE**? a) they contain a core of keratin filaments b) they facilitate absorption c) they form the striated border along intestinal absorptive cells
- 5- The kinetochore is the point where: a) microtubules of the spindle apparatus attach. b) microtubules are formed. c) microtubules disappear.
- 6- Which one of the following statements concerning cilia is **FALSE**?
a) they contain 9 pairs of microtubules b) they contain dynein arms, which have ATPase activity c) they are nearly identical to basal bodies
- 7- In the metaphase, the chromosomes migrate to: a) one side of the cell. b) the two sides of the cell. c) the equator of the spindle.
- 8- Lysosomal enzymes are synthesized and segregated in:
a) RER b) SER c) Golgi apparatus
- 9- Meiosis I known as: a) division b) duplication c) reduction
- 10- Sarcoplasmic reticulum is a specialized form present in:
a) liver cells b) nerve cells c) muscle cells
- 11- The centromeres still intact in: a) anaphase I b) anaphase II c) metaphase I
- 12- The nuclear envelope includes all of the following **EXCEPT**: a) the nuclear lamina b) the outer nuclear membrane c) the nuclear pore complexes

III- By labeled drawing only, illustrate:

5 marks

Mitochondria	RER	Ribosome