



Assiut University
Faculty of Science
Zoology Department

Course name: Comparative
anatomy of vertebrate

Course code: (432-Z)

Time: two hours



Answer the Four following questions

Question 1:

(25 pt.)

- **Choose the single response that is the correct answer of the following.**

1. **A uniepidermal layer exist in the skin of**
 - a) Amphibia
 - b) Reptilia
 - c) Cephalochordate
 - d) Hag fish
2. **Which of the following is not epidermal derivative?**
 - a) Antler
 - b) Claws
 - c) Ramphoceaca
 - d) Scales of osteichthyes
3. **The dermis develops from**
 - a) Myotome
 - b) Dermatome
 - c) Sclerotome
 - d) Mesodermal somites
4. **The prominent component of the vertebrate dermis are**
 - a) Elastic fibers
 - b) Collagen fibers
 - c) Divided cells
 - d) Glandular cells

5. Ecdysis is a phenomenon among

- a) Toads
- b) Lizards
- c) Ophidia
- d) All Reptiles

6. Which of the following is untrue of the toad skin?

- a) Contains poisonous glands
- b) Moisture by mucous
- c) Respiration across it
- d) Contains osteoderm

7. The Langerhans cells may play

- a) A sensory function
- b) A nutritive function
- c) Mediated actions of the immune system

8. Reptilian teeth are

- a) True teeth
- b) Dermal in origin
- c) Permanent
- d) Replaced

9. Pterylae are areas at which arise

- a) Bony scales
- b) Epidermal scales
- c) Avian feather

10. Exoskeletal structures of birds presented by

- a) Feather and claws
- b) Feather and horny scales
- c) Ramphoceaca and claws
- d) (b& c)

11. A true horn arises as
- a) Bony ossicles
 - b) Epidermal keratin
 - c) Dermal bone
12. In which bone category is the frontal?
- a) Replacement
 - b) Dermal
 - c) Prechordal
 - d) Endochordal
13. The parachordal contributes in the formation of
- a) Basal plate
 - b) Ethmoid plate
 - c) Occipital ring
 - d) Sense capsules
14. Fate of the otic process is
- a) Arcualia
 - b) Quadrate
 - c) Incus
 - d) Epipterygoid
15. The synsacrum is
- a) An adaptive feature
 - b) A phylogenetic feature
 - c) Non of the above
16. The upper temporal arch of a diapsidian skull composed of
- a) Postorbital and squamosal
 - b) Jugal and quadrate
 - c) Postfrontal and parietal

17. Which of the following does not form a part of the secondary palate?

- a) Maxilla
- b) Palatine
- c) Vomer
- d) Pterygoid

18. Avian skull is derived from

- a) Anapsidian skull
- b) Synapsidian skull
- c) Diapsidian skull

19. Jaw suspension in all teleost performs by

- a) Ligaments
- b) Hyomandibular
- c) Otic process
- d) Ascending process

20. The main characteristic of the therapsidian skull

- a) Is of synapsid skull
- b) Has a pair of occipital condyles
- c) Presence of secondary palate
- d) All of the above

21. The only homology of vertebrae in lampreys

- a) Notochord
- b) Lateral neural cartilage
- c) Myomeres
- d) Dorsal hollow nerve

22. The structures which overlap each other to provide support in tetrapod vertebrae are

- a) Transverse process
- b) Spinous process
- c) Neural arch
- d) Zygapophyses

23. Sphenoid bones constitute from

- a) Ossification of the trabecular plate
- b) Ossification of the parachordal plate
- c) Ossification of the anterior region of the parachordal plate
- d) (a& c)
- e) Non of the above

24. Highly streptostylic skull that of

- a) Amphibia
- b) Bird
- c) Mammalia
- d) Snakes

25. Developmental change in location of mesoderm that form vertebrae

1. Intersegmental to segmental
2. Segmental to intersegmental
3. Visceral to somite
4. Epiaxial to hypoaxial

Question 2:

(5 pt)

- **List only, no commentary needed**

1. Keratinization is a major challenge to face
2. Collagen fibers arrange in dermis of amphioxus.....
3. Giraffe horn arises as.....from.....and
covered with.....
4. Skull dermal bones are homologous to.....
of.....
5. Mammalian jaws joint is achieved by.....

Question 3:

(10 pt.)

- Compare the structure and developmental stages of the petromyzon and mammalian teeth.

Question 4:

(10 pt.)

- Describe only one of the following
- A. The fate of mandibular and hyoid arches in tetrapod.
 - B. The development of vertebrae.



Assiut University Faculty of Science Department of Zoology	Final exam of Experimental Embryology (Z438) for Zoology students	May, 29th 2017 Time: 2 hours Total marks: 50
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Questions are in six pages

Section I: choose the right answer: (5 marks)

1- Father of experimental embryology is

(a) Wolff (b) Karl Ernst Von Baer (c) Wilhelm Roux (d) Ernst Haeckel

2- Destructive metabolic phase in regeneration is

(a) catabolic (b) anabolic (c) respiratory (d) excretory

3- The greatest regenerative ability is found in

(a) amphibians (b) reptiles (c) mammals (d) coelenterates

4 – Frog tadpole is a

(a) Primary larva & direct developer (b) Primary larva & indirect developer

(c) Secondary larva & direct developer (d) Secondary larva & indirect developer

5- Respiration in Amphibian tadpoles is achieved by

(a) gills (b) lungs & skin (c) gills & skin (d) none of them

Section II: State true or false: (5 marks)

- 1- Tail regeneration in lizards is called epimorphosis. ()
- 2- Blastema fails to regenerate due to X-ray ()
- 3- Larval forms of animals are specialized for growth. ()
- 4- Thyroxin is the most active player in metamorphosis. ()
- 5- Aristotle is considered the first major embryologist known to history. ()

Section III: Fill in the space with suitable words: (10 marks)

- 1- Cell death during tadpole metamorphosis involves ,
..... and
- 2- is a co-discoverer of sperm.
- 3- Except, platy helminthes do not regenerate to any extent.
- 4- Preformationists are divided into.....and.....
- 5- Marcelo Malpighi was famous for: ,
..... and

Section IV: Answer the following two questions: (10 marks)

- 1- What are the ethical aspects that should be considered in experimental embryology lab?

2- Describe the biochemical respecification during metamorphosis.

Section IV: (10 marks)

1- Explain and draw the different stages of amphibian limb regeneration.

Section V: Explain and give significance of ONE experiment of the following: (10marks)

- 1- Effect of caffeine on embryonic development with special reference to corneal tissue.**
- 2- Effect of mobile electromagnetic field on embryonic development.**
- 3- The harmful effect of cigarette smoke residues on embryonic health.**
- 4- Teratogenic effect of ethanol vapor on embryonic development.**
- 5- Cadmium as a heavy metal and its harmful effect on embryonic development.**

Dr. Reda A. Ali	Final exam of	May, 29 th 2017
Dr. Reda A. Ali	Experimental Embryology	Time: 2 hours
Department of Zoology	(Z438) for Zoology students	Total marks: 50
Questions are in six pages		

Section I: Choose the right answer (5 marks)

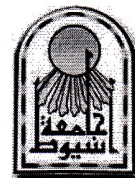
- 1- Father of experimental embryology is
(a) Wolff (b) Karl Ernst Von Baer (c) Wilhelm Roux (d) Ernst Haeckel
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- 3- The greatest regenerative ability is found in
(a) amphibians (b) reptiles (c) mammals (d) coelenterates
- 4- Frog tadpole is a
(a) Primary larva & direct developer (b) Primary larva & indirect developer
(c) Secondary larva & direct developer (d) Secondary larva & indirect developer

End of questions Best of luck

- (a) gills (b) lungs & skin (c) gills & skin

Dr. Reda A. Ali

Prof. Experimental Embryology



Assiut University
Faculty of Science
Zoology Department

Second Semester Final Exam of
Field Training Course / May 2017

Time: 2 hour
Level: Forth
Course Code: 446Z

Answer the following questions (50 marks)

(I) Answer SIX only of the following:- (24 marks)

- 1- Explain in details steps and principal idea of insect collection from soil samples using Berlese funnel.
- 2- Using a key for soil arthropods explain how to discriminate between different classes of Arthropoda
- 3- Definition and types of augmentation as biological control method
- 4- Drop and rotary spreaders of insecticides
- 5- How do you discriminate between different soil immature insect stages
- 6- Explain briefly the potential risk of nanopesticide application in pest management
- 7- The following formulae are written on different pesticides, explain the meaning of letters
(EC- SP- G- F- WSP)

(II) Complete the following sentences (10 marks)

- 1- Formulations of nanopesticides are--and.....
- 2- In pesticide toxicity category IV refers to
- 3- Conservation is a type of biological control in which.....
- 4- Nanoparticles are present in insect body such asand.....
- 5- According to the targeted pest, pesticides can be classified into-.....-.....-.....and
- 6- A good pesticide should be-.....-.....and

(III) (A) Look at the following table and answer the following :- (8 marks)

Pesticide	Larval period of <i>Spodoptera littoralis</i> (day)	Food consumption of <i>S. littoralis</i> larvæ (gram/day)	Adult fecundity (%)
Silver nanoparticles	15±1.6	1.2±0.2	87±11
Zinc oxide nanoparticles	18±0.9	1.9±0.8	86±12
Gold nanoparticles	11±0.6	0.6±0.11	87±11
Iron oxide nanoparticles	8±0.8	2.4±0.8	87±13
Control	18±1.0	2±0.9	91±6

- 1- Which pesticide is better to control *S. littoralis*? Explain why?
- 2- Which one can be used in water treatment and explain how?
- 3- Briefly explain two approaches to prepare these particles

(B) Look at the following table and answer the following :- (2 marks)

Pesticide	LC50 (%) on <i>S. littoralis</i> larvae
Camphor oil	5.05
Castor oil	12.77
Neem oil	8.44

- 1- Which one of these plant oils is more toxic on *S. littoralis* larvae? Why?

(C) Look at the following images and answer related questions: - (6 marks)



1- This type of mouth parts is present in order



2- This type of abdominal gills is present in order

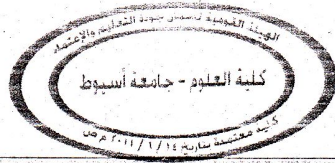


3- This larva belongs to order



4- This specimen belongs to order

Best wishes.....



Answer the following questions

Q1 Choose the correct answer(15 mark one for each)

1- Funicular cords are:

- a) Strands used for locomotion b) a strand of protoplasm. this enables nutrients to be transferred from one individual to another
c) Structures for disposing of waste and can also be used for catching prey and nutrients
d) Reproductive structures

2- The members of phylum Sipuncula are distinguished from the other phyla in this group by having

- a) an introvert- b) metamerism. c) a trochophore larvae d) a closed circulatory system

3- The members of phylum Pogonophora are distinguished from the other phyla by having

- a) an introvert- b) no mouth or digestive tract c) metamerism d) a closed circulatory system

4- A crown of ciliated tentacles in a double row around the mouth opening, which is used for respiration and feeding, is called a(n)

- a) proboscis b) radula c) introvert. d) lophophore

5- In a colonial Ectoproct, each member of the colony is called

- a) cystid b) zoecium c) polyp. d) zooid

6- The unique larva of the ectoprocts is

- A- actinotroch b- trochophore c- planula d) golichidium-

7- Which of the following is not a section of the tripartite coelom seen in lophophorates?

- A. mesocoel B. protoel C. metacoel D. proctocoel

8- Which of the following marine phyla depend on chemosynthesis by bacteria to obtain their food?

- a. Sipuncula b. Micrognathozoa c. Cheatognatha d. Pogonophora

9- Which is referred to as the Peanut Worm?

- a) Sipuncula b) Annelida c- Echiura d- Pogonophora

10- Which of these have a U-shaped digestive tract?

- a) Sipuncula b) Annelida c) Echiura d- Cheatognatha

11- Which of the following like rotifer and living in the space between bottom sediments in marine and freshwater

- a) Sipuncula b) Annelida c) Echiura d) Gastrotricha

12- Extinction of the _____ of a community could lead to the extinction of other members of the community.

- a) decomposers b) primary consumers c) keystone species d) dominant species

13- The idea that forests should be preserved because of their beauty refers to ____.

- a) medicinal value b) scientific value c) direct economic value d) aesthetic value

الإجابة 4

14-The level of biodiversity that involves a variety of habits and communities is

A)ecosystem diversity.B)genetic diversity.C)population diversity.D)species diversity.

15-Reduction in the sea otter population affected the Pacific coast ecosystem by

A)decreasing the biodiversity of the ecosystem.B)reducing the size of the sea urchin population.
C)increasing the biodiversity of the ecosystem. D) promoting the increased growth of the nearby kelp beds

Q2-Write the Scientific term (10 mark one for each)

- 1-Differences in DNA among individuals within a species or population
- 2-The quantitative pattern of rarity and commonness among species in a sample or a community
- 3-Priority area of conservation having extremely rich in species and are under treat of extinction
- 4-A species that is at serious risk of extinction
- 5-A measure of the homogeneity of abundances n in a sample or acommunity
- 6-Protected area of land or coastal environment having unique biodiversity.
- 7-The members of phylum which live exclusively on mouthparts of marine decapod crustaceans in northern hemisphere.
- 8-The number of species in a community, in a landscape or marin escape, or in a region
- 9-Book contains a record of animals and plants which are known to be in danger and published by IUCN
- 10-phylum has members that live between sand grains and can retract their bodies into a circular lorica

Q3-With labellingdrawing illustrate body plan five phyla only of the following (10mark 2 each)

- 1- Priapulida 2-Micrognathozoa 3-Gnathostomulida 4-Gastrotricha
5-Phoronida 6-Cheatognatha

Q4-Answer the five only of following questions(15mark3 each)

- 1-Commppare between the classes of phylum *Nemartea*
- 2-Commppare between the classes ofphylum*Brachiopoda*
- 3-Write the mathematical formula and its use for each
a-Shannon-Wiener Index (H) b-Jaccard's index
- 4-Generalized Life Cycle of Phylum *Acanthocephala*
- 5-Explain the causes lead to loss of biodiversity
- 6- Demonstrate with a plan different mechanisms involved in the conservation of biodiversity

Good Luck

لجنة الممتحنين

أ.د/ أزهار حسين محمد

Answer four only of the following questions: (12.5 marks each)

- Q1.** a) Mention the major types of animal learning and show which of them is found in insects. (5 marks)
b) A mated female medfly does not lay eggs inside fruits marked with "marking pheromone". Do you think this behavior is adaptive? Explain why. (5 marks)
c) Why cuticular hydrocarbons are important for social insects? (2.5 marks)
- Q2.** a) Write an account on behavioral homeostasis. (5 marks)
b) What is the difference between 'primer' and 'releaser' pheromones? Write short accounts on three types of releaser pheromones. (5 marks)
c) Compare between sociobiology and ethology. (2.5 marks)
- Q3.** a) Write an account on sound communication in insects. (7.5 marks)
b) Compare between Batesian and Mullerian mimicry, giving one example for each. (5 marks)
- Q4.** a) Illustrate with drawing only the waggle-dance in honeybees. Explain its main components and the information encoded in each component. (5 marks)
b) Define the following terms:
1) Concealing coloration 2) Habituation 3) Semiochemicals
4) Revealing coloration 5) Reflexive bleeding (7.5 marks)
- Q5.** a) Mention the cues that guide insects during navigation, giving a short account on only one of them. (3 marks)
b) "Signals are not always honest in nature". Explain this statement giving one example from insect behavior. (3 marks)
c) With a labelled drawing only, illustrate the molecular basis of circadian rhythm in *Drosophila*. (6.5 marks)

_____ End of questions _____ Good Luck _____

Prof. Dr. Medhat M. Sadek



Assiut University Faculty of Science Zoology Department	Final Exam of Principles of Embryology & Evolution (Z418) For 4 th levels Geology Students	June, 4 th 2017 Time: Two hours Total marks: 50
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الأسئلة في صفحتين

Section I: Principles of Embryology

Answer the following questions using labeled drawings when it is possible:

- Q1- Compare between the blastulae of *Amphioxus* and toad. (5 marks)
- Q2- Account the different types of ova giving example for each. (5 marks)
- Q3- Show with labeled drawings only the structure of: (a) sperm (b) chick egg (6 marks)
- Q4- Show with labeled drawings only differentiation of mesodermal somite in *Amphioxus* and toad. (4 marks)
- Q5- State true or false: (5 marks)
- i- Chordamesoderm is located at the roof of archenteron.
 - ii- Distal centriole functions for the union of male and female nuclei.
 - iii- Fertilization cone helps to prevent entry of new sperms into the ovum.
 - iv- The value of pH is not important factor during fertilization.
 - v- Type of cleavage in chick embryo is superficial meroblastic one.

بقية الأسئلة في الصفحة التالية

Section II: Evolution

Q6: Correct over the line:

(9 marks)

- 1- Antibiotics give rise to new bacteria.
- 2- Natural selection causes Progeria Syndrome.
- 3- The sheep Dolly is an evidence of evolution.
- 4- Finches of Galapagos are examples of macroevolution.
- 5- Gene flow is prevented by natural selection.
- 6- BURGESS SHALE fossils are soft macroscopic organisms.
- 7- Darwinism is known as the inheritance of acquired characteristics.
- 8- Darwin and Wallace established mutation to be the mechanism of evolution.
- 9- Haeckel's Tree revealed sudden origin of different species with complex organs at the same time.

Q7: Answer only three of the following:

(12 marks)

- 1- Illustrate why the transition of organisms from water to land is impossible.
- 2- Cloning as an "evidence for evolution" is deceptive? Discuss briefly.
- 3- Compare between immunity of bacteria against antibiotics & evolution.
- 4- Demonstrate the distribution of animals according to Darwinism & fossil record.

Q8: Give the evolutionary term for the following:

(4 marks)

- 1- Non-living matter could come together to form living organisms.
- 2- Wings in insects, birds & bats.
- 3- A struggle for survival in nature.
- 4- Pituitary gland, wisdom teeth & appendix.

End of questions.....Best of Luck

Dr. Reda A. Ali

Hanaa Atef



Assiut University
Faculty of Science
Zoology and Entomology
Department



Selected Topics in Entomology 1
course
Second Semester/16/5/2017



Time: 3 hrs
Level: 4th
Code: 452 E

First Question: Answer Five only of the following: (15 marks)

- A) Explain the roles of the workers and the drones in the honeybee colony.
- B) Briefly describe the queen biology, and explain the factors that affect the egg laying, and how to select a good queen for your hive.
- C) I am in danger because I found a large cluster of honeybees hanging from a limb in one of my trees. I know that they were not there yesterday what do you know about this phenomenon? and what do I do?
- D) What is the *Varroa destructor* mite and how does it impact honey bees?
- E) How do you prevent your honeybees from stinging you when you take their honey?
- F) What is the chemical composition of the honey?

Second Question: Answer Five only of the following: (10 marks)

- A) How do bees make honey?
- B) Why doesn't honey spoil?
- C) Why are honeys different colors? Mention the most important types in Egypt.
- D) What are the health benefits of the honey?
- G) What are the functions and the chemical composition of bee venom?
- H) What are the signs of egg laying workers in the bee hive?

See the next page

Third Question: Explain the function (s) of the following: (15 marks)

- A) Queen and worker mandibular pheromones. (6 only)
- B) Brood recognition pheromone. (6 only)
- C) Tarsal, Nasanove, hypopharyngeal and Dufour glands.
- D) Honeybee hive.
- E) Egg marking pheromone, forager pheromone, queen retinue pheromone and 2-heptanone.

Fourth Question: (A) Define Five only the following: (2.5 marks)

- a) Apiculture b) Migratory beekeeping c) Royal jelly
- d) Bee bread f) Nosema disease g) Bee smoker

(B) What will happen in the following situations? (5 marks)

- 1) If the queen honeybee became old and produce lesser pheromone. (Explain)
- 2) If a queen dies unexpectedly and the workers are unable to raise an emergency queen to replace her. (Explain the fate of the colony and why)
- 3) If your hive is infected with American foulbrood disease?

(C) Answer the following questions about waggle dance (2.5 marks)

You are a bee working in your hive. A forager returns and does the waggle dance, slowly wagging downwards and to the left (8 o'clock position). Answer the questions below about her dance.

- 1) She is dancing the waggle dance. What does this communicate about the distance of the food source (why isn't she using the round dance)?
- 2) She is dancing slowly. What does this communicate about the distance of the food source?

End of the Questions

With my Best Wishes

Dr. Ali Mohamed Ali



Answer all the following questions:

Q1 Fill in the following sentences: (16 marks)

- 1) MHC class I is expressed on the surface of..... while MHC class II is expressed on the surface of
- 2) NK cells produce cytotoxic proteins such as.....andonto the surface of.....
- 3) All the immune cells except.....are developed and matured in the.....
- 4) The three types of progenitor stem cells areand..... therefore T cells originate from thelineage, but DC cells originate from.....
- 5) CD40 is expressed on the surface ofand binds with a receptor known as.....on the surface ofduring immunological synapses.
- 6) T helper cells express CD3 and CD4, while T cytotoxic express

Q2 Write briefly on three only of the following: (12 marks)

- A. Primary and secondary mediators of hypersensitivity.
- B. B and T cell receptors.
- C. Passive and active immunity.
- D. Inflammation.

Q3 Write in details using diagrams the three different complement system pathways: (10 marks)

Q4 Answer three only of the following items: (12 marks)

- A. The process of phagocytosis and its importance for antigen presentation.
- B. In a table compare between the different classes of antibodies.
- C. Malignant WBCs disorders.
- D. The 4 types of hypersensitivity.

GOOD LUCK

Dr. Gamal Badr

Professor of Immunology

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امتحان مقرر وراثة العشائر (٤٠٢ ز)

الزمن: ساعتين

لطلاب الساعات المعتمدة بكلية العلوم

الفصل الدراسي الثاني ٢٠١٦ / ٢٠١٧ م

كلية الزراعة - قسم الوراثة

أجب عن الأسئلة التالية: -

السؤال الأول: (١٥ درجة)

في العشيرتين التاليتين كانت أعداد الأفراد للطرز الوراثة المختلفة لموقع جيني كما يلي:

	AA	Aa	aa	N
العشيرة الأولى	400	400	200	1000
العشيرة الثانية	200	400	400	1000

١. احسب التكرارات الأليلية ثم اختبر اتزان العشيرة.

٢. حدد نوع التزاوج الشائع بالعشيرة.

السؤال الثاني: (١٠ درجات)

١. في الكلاب يسود أليل اللون الأسود B على أليل اللون الأصفر b سيادة تامة ، فإذا كان تكرار

الأفراد سوداء اللون في العشيرة 0.91 ، احسب التكرار المتوقع للأفراد الخليطة وراثياً.

٢. إذا كان معدل الطفور الطردي لموقع جيني معين في العشيرة $\mu = 1 \times 10^{-5}$ ، ومعدل الطفور

العكسي $\nu = 0.5 \times 10^{-5}$ ، احسب التكرار الأليلي عند الاتزان بين هاتين القوتين المتضادتين.

السؤال الثالث: (١٠ درجة)

١. يصاب في إحدى العشائر واحد من كل 50 ذكر بمرض سيولة الدم (صفة مرتبطة بالجنس) ،

ماهي نسبة الإناث التي من المتوقع أن تكون مصابة بسيولة الدم ؟

٢. في عشيرة متزنة، يظهر على 0.09 من الرجال صفة الصلع baldness (صفة متأثرة بالجنس) ،

احسب نسبة الصلع المتوقعة بين نساء هذه العشيرة.

السؤال الرابع: (١٥ درجة)

لموقع جيني ذو ثلاث أليلات (A, a, a') وجدت التكرارات التالية باحدى العشائر:

الطرز الوراثة	AA	Aa	Aa'	aa	aa'	a'a'
التكرار	0.00	0.20	0.40	0.00	0.30	0.10

احسب التكرارات الأليلية ، وتكرارات الطرز الوراثة عند الاتزان.

انتهت الأسئلة - مع تمنياتنا بالتوفيق

أ.د/ محمد راغب الحلو د.د. محمد إبراهيم محمد