

University: Assiut  
Faculty: Science  
Department: Zoology

Introduction to embryology & evolution

Code: 418 Z

Time: 2 hrs.

Total degree = 50

Final exam. June 2015

لاحظ الأسئلة في صفتين

### I. Embryology

**Q1. Choose the correct answer:**

**(10 marks)**

1- Brain of vertebrates develops from:

- a) Ectoderm   b) Endoderm   c) Mesoderm

2- Corona radiata is present in:

- a) Amphibian egg   b) Reptilian egg   c) Avian egg   d) Mammalian egg

3- Blastocoel is a circular cavity lined by one layer of cells in:

- a) Chick   b) Amphioxus   c) Frog

4- Polar bodies are formed during:

- a) Spermatogenesis   b) Organogenesis   c) Oogenesis

5- External fertilization is seen in:

- a) Lizard   b) Fish   c) Pigeon   d) Rabbit

6- Gastrulation of toad involves:

- a) Epiboly   b) Invagination   c) Involution   d) All

7- The acrosome of sperm is derived from:

- a) Golgi apparatus   b) Mitochondria   c) Nucleus   d) Ribosomes

8- Meroblastic cleavage occurs in:

- a) Amphioxus   b) Frog   c) Rabbit   d) None of these

9- To dissolve egg covering sperm produces:

- a) Hyaluronic acid   b) Hyaluronidase   c) Trypsin   d) Nucleases

10- Which of the following possesses archenteron:

- a) Blastula   b) Morula   c) Gastrula   d) Hydra

تابع باقى الأسئلة الصفحة التالية

**Q2: Discuss only three of the following:**

**(15 marks)**

- A-Types of allantois' placenta. B- Formation of gray crescent & its importance in amphibian development.  
C- Formation of primitive streak of chick. D- Development of mesoderm in Amphioxus.

## **II. Evolution**

**Q3: Correct the over line:**

**(9 marks)**

- 1- Mutations give rise to new species.
- 2- Darwin and Wallace established "the inheritance of acquired traits."
- 3- Finches of Galapagos are examples of new types.
- 4- Populations are different species if gene flow is prevented by natural selection.
- 5- Lamarckism was formulated by adding the concept of mutation to Darwin's.
- 6- Sickle-cell anemia and Progeria Syndrome are evidences of evolution.
- 7- BURGESS SHALE fossils proved the gradual evolution.
- 8- "Nebraska Man" is a missing link between humans and Great apes.
- 9- Haeckel's Tree based on sudden origin of different species at the same time.

**Q4: Answer only three of the following:**

**(12 marks)**

- 1- How Mendel opposed not only Lamarck's model of evolution, but also Darwin's.
- 2- Evolution's claim that "fish are the ancestors of land-dwelling creatures is invalidated by anatomical and physiological observations as much as by the fossil record". Discuss briefly.
- 3- "Homology and evolution lost all significance in the light of new scientific findings". Explain with an example.
- 4- Illustrate six doubts of evolution thesis by natural selection.

**Q5: Give the evolutionary term for the following:**

**(4 marks)**

- 1- Non-living matter could come together to form living organisms.
- 2- Organs different in structure but similar in function. 3- Variations within the same species.
- 4- Coccyx, appendix, thymus, semi-lunar fold in the eye, tonsils.



Answer the following questions with Labeled drawing if they needed

**1- Put  $\checkmark$  or X in front of following sentences and correct the wrong one:- (10 degree)**

- 1 Craniata have no atrium. ( )
- 2 The snout region of the skull is not developed in tetrapoda ( )
- 3 The lower jaw of Amphibia consists of a maximum of six bones ( )
- 4 The Tuatara has immovable quadrate bone ( )
- 5 Jacobson's organ is usually well developed in order Squamata ( )
- 6 The tongue is completely retractile within a sheath in snakes ( )
- 7 The palate is schizognathous in Caprimulgiformes ( )
- 8 Apterygiformes have pubic symphysis and ischiatic symphysis ( )
- 9 Well-developed marsupial pouch is present in females of metatheria ( )
- 10 Dermoptera the only mammals with true flight ( )

**2- Mention THREE taxonomic characteristics for FIVE only from the following (10 degree)**

- |                |                  |             |
|----------------|------------------|-------------|
| 1. Rat-fish    | 4. The Sturgeons | 7. Eutheria |
| 2. Lung-fishes | 5. The gar-pikes | 8. Ostrich  |
| 3. Bichir      | 6. Sauria        |             |

**3- Compare between each pair of FIVE only from the following: (10 degree)**

- 1- Hagfishes & Lampreys
- 2- Chondrichthyes & Osteichthyes
- 3- The Sharks & Rays
- 4- Heart and aortic arches of a urodele & an anuran
- 5- Chelonia & Crocodilia
- 6- Ciconiiformes & Anseriformes
- 7- Allotheria & Theria

**4- Mention the taxonomic characters for FIVE only from the following: (10 degree)**

- |                   |                 |
|-------------------|-----------------|
| 1. Gnathostomata  | 6. Aglossa      |
| 2. Pisces         | 7. Reptilia     |
| 3. Elasmobranchi  | 8. Amphisbaenia |
| 4. Apoda          | 9. Aves         |
| 5. Actinopterygii | 10. Mammals     |



5- Answer TWO only from the following themes:

(5 degree)

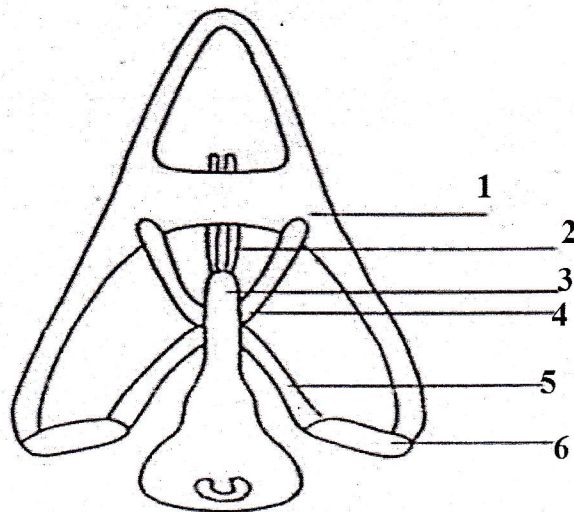
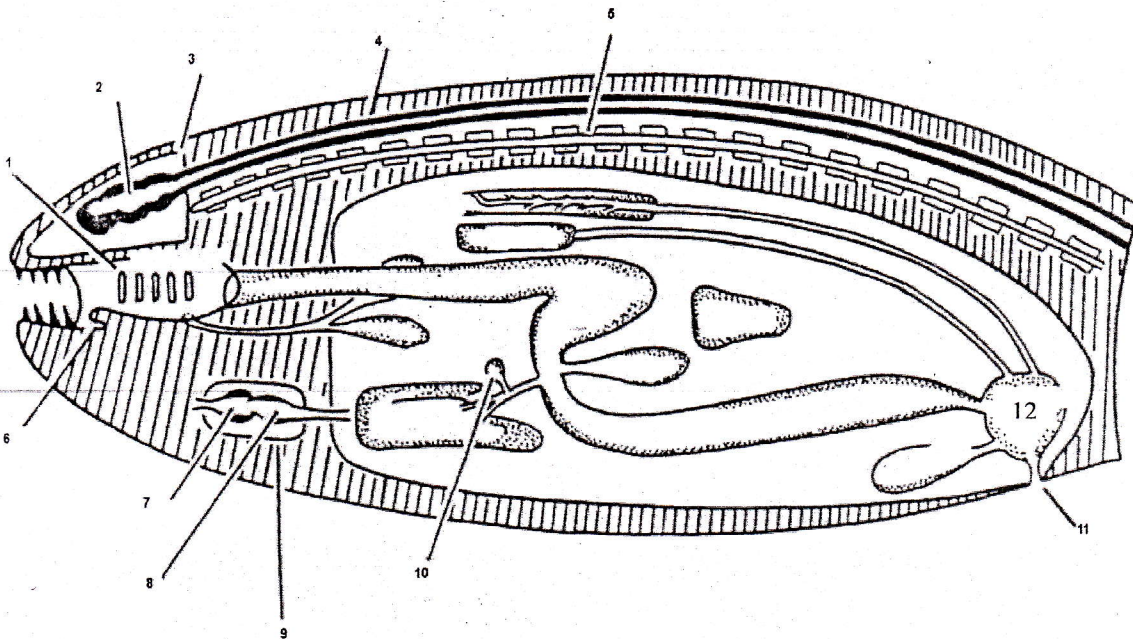
1- Diagrammatically shows arrangement of nesal openings in Crossopterygii.

2- Diagrammatically shows generalized vertebrate brain.

3- Mention the orders of infra-class Eutheria and explain three of them?

6- Define and label each of the following items:

(5 degree)



With my best wishes.....







(1)

**Answer all the following questions:**

**Q1 Fill in the following sentences: (20 marks)**

- 1) T cell receptor consists of one .....chain and one .....chain and has only one.....located among the.....
- 2) NK cells produce cytotoxic proteins .....and .....onto the surface of.....
- 3) B cells have distinct recognition receptor know as .....which consists of four chains: two.....and two.....and this receptor possesses only two.....sites located between.....
- 4) Based on the type of constant region of the heavy chains.....are classified into .....classes which are:.....,.....,.....and.....
- 5) All the immune cells except.....are developed and matured in the.....
- 6) The progenitor stem cells are classified into three types: .....and....., therefore T cells originate from the .....lineage, but DC cells originate from.....
- 7) CD40 is expressed on the surface of .....and binds with a receptor known as.....on the surface of .....during immunological synapses.
- 8) The four cell types that act as APC cells are .....and .....
- 9) Pollen, dust mites and insect stings can act as..... causing.....
- 10) Mature B cells are classified into three types:.....and.....
- 11) T helper cells express CD3+ and CD4+, while T cytotoxic express.....and .....and macrophages express.....

**Q2 Write in details using diagrams the three different complement system pathways: (12 marks)**

**Q3 Write briefly on three only of the following: (9 marks)**

- A. Epithelial surfaces as an important factor of innate immunity.
- B. Mast cells and their primary and secondary mediators of allergy.
- C. Natural and artificial adaptive immunity.
- D. Inflammation.

**Q4 Answer three only of the following items: (9 marks)**

- A. Organs of immune system.
- B. In a table compare between the different classes of antibodies.
- C. Benign WBCs disorders.
- D. Factors of innate immunity that limit growth of microorganisms within the body.

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**GOOD LUCK**

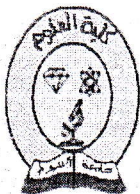
**Dr. Gamal Badr**

Associate Professor of Immunology

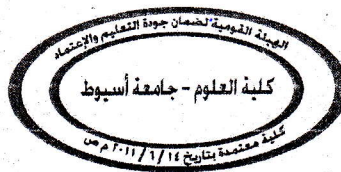
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Assiut University  
Faculty of Science  
Zoology Department



Fourth year Exam (Zoology)  
Course name: Comparative anatomy  
Course code: ( 432-Z)  
Time: 2 hours

**Answer the four following questions**

**First question: Choose the single response that is the correct answer of the following.** (25 marks)

**1. Goblet cells are common in:**

- a) Only in Amphioxus
- b) Only in Fish
- c) Amphioxus and some bony Fish sp.
- d) Fish and Amphibia

**2. The epidermis produces mucous in:**

- a) Fish and Amphibia
- b) Birds and Reptilia
- c) Only Fish
- d) Only Amphibia

**3. Which of the following is untrue of the amphibian skin?**

- a) Contains poison glands
- b) Moisture by mucous
- c) Respiration occurs across it
- d) Contains osteoderms

**4. Keratinization is major challenge to face:**

- a) Humid environment
- b) Terrestrial life
- c) Enemies
- d) Dry habitat

**5. The Langerhans cells are stellate cells:**

- a) Dispersed singly throughout the dermis
- b) Dispersed singly throughout the epidermis and may play a role in cell mediated action of the immune system
- c) b, and present in all vertebrate skin



**6. The most conspicuous component of the dermis:**

- a) Collagen fibers
- b) Elastic fibers
- c) Divided cells
- d) Glandular cells

**7. The dermal bony scales are prominent in:**

- a) Ostracoderm
- b) Osteichthyes
- c) Mammals
- d) Reptiles

**8. Fibers among the aquatic vertebrates lie:**

- a) Parallel
- b) At angle to each other
- c) Perpendicular

**9. A true horn arises as:**

- a) Bony Ossicles
- b) Epidermal Keratin
- c) Dermal bone

**10. Mammalian hairs may perform:**

- a) Sensation
- b) Protection from wild enemies
- c) Attracting the preys during hunting

**11. Specialized functions of the skin:**

- a) Form an exoskeleton
- b) Prevents the entrance of pathogens
- c) Hold the shape of organism
- d) All of the above

**12. The only homology of vertebrae in lampreys:**

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

**13. Which of the following is not part of axial skeleton?**

- a) Hyoid
- b) Middle ear ossicles
- c) Ribs
- d) The pelvic

**14. Fate of the otic process is:**

- a) Articular
- b) Quadrate
- c) Incus
- d) Stape



15. The Amphibian skull possess:

- a) Tripartite occipital condyle
- b) Pair occipital condyle
- c) Only one occipital condyle

16. The synsacrum is:

- a) An adaptive feature
- b) A phylogenetic feature

17. The occipital and sphenoid bones are part of the:

- a) Chondrocranium
- b) Splanchnocranium
- c) Dermatocranium
- d) None of the above

18. The squamosal and quadratojugal the series of the dermal bones:

- a) Facial
- b) Orbital
- c) Temporal
- d) Vault

19. Which of the following bones does not form a part of the secondary palate in alligatores?

- a) Maxilla
- b) Palatine
- c) Premaxilla
- d) Frontal

20. The parietal bone in the category of bone:

- a) Replacement
- b) Dermal
- c) Endochondral
- d) Prechordal

21. The jaw joint presents in mammals is:

- a) Palatine angular
- b) Articular- angular
- c) Dentary- squamosal
- d) Quadrate- articular

22. Avian skull is derived from:

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

23. Jaw suspension in all teleostei:

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



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

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

25. Developmental change in location of mesoderm that form vertebrae:

- a) Inter-segmental to segmental
- b) Segmental to inter-segmental
- c) Visceral to somatic
- d) Epiaxial to hypoaxial

**Second question: Fill in the blanks (5 marks)**

1. Ecdysis includes.....
2. Rhinoceros has a ..... horn.
3. Giraffe horn arises as ..... bone from ....., covers with .....
4. Sternal rib articulating with....., composed of .....
5. Mechanoreceptors in vertebrates; 1-.....  
2-.....

**Thrd question: Describe the structure and the developmental stages of one (a or b or c) from the following: (10 marks)**

- A- Mammalian teeth
- B- Chondrocranium
- C- Vertebrae

**Fourth question:: Explain the structures of the following (10 marks)**

- A- Placoid scale
- B- Middle ear

Assiut University  
Faculty of Science  
Department of Zoology



Fourth level (Zoology section)  
Fisheries Science Z494  
Time: Two hours

June, 2015  
Final Exam

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Answer the following questions:

1- Define

(10Marks)

- Benthos
- Summerkill
- Unitstock
- Zooplankters
- Phytoplankters

- Virtual population
- Homeostasis
- Growth
- Systems analysis
- Direct enumeration

2- Discuss in details the importance of the rooted aquatic plants in a lake. (12Marks)

3- Describe the management of coldwater and warmwater fisheries. (10Marks)

4- Mention the most obvious approaches delineating a stock. (6 marks)

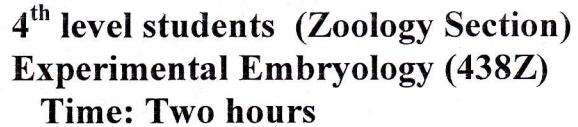
5- Explain the factors can affect recruitment. (6 Marks)

6- Write in details about approaches to estimating fishing mortality. (6 Marks)

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Best wishes

Prof. Dr. Usama M. Mahmoud





**Prof. Abdallah B.Mahmoud**