

أسئلة وأجوبة إمتحان لأفقاريات ٢٢١ ح

(ورقة إمتحانية كاملة)

كلية: العلوم

قسم: علم الحيوان

المستوى: الثانى

الشعبة: حيوان - حيوان وكيمياء - بيوتكنولوجى

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الممتحنون: د/ جيهان حسين لاشين

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Benha University
Faculty of Science
Zoology Department
Jan., 2017
2nd Level of Zoology, Zoology-Chemistry & Biotechnology
Time Allowed: 2 Hrs



INVERTEBRATES 221 Z

Part (1)

I- (a) Complete the following:- [10 Marks]

1. Respiration in *Neries* takes place bywhile in *Penaeus* takes place by.....
- 2.Coelom in Annelida performs different functions , &
- 3.Serial homology means while Autotomy means
- 4.Nerve cord of *Scolopendra* consists of ganglion while in *Scorpion* consists of ganglion .
5. The Spermathecae of Earthworm arepairs situated in segments and they receive
- 6.Excretion in *Hirudo* takes place by pairs of nephridia from these nephridia , there are pairs called testicular nephridia
7. The blood of has no respiratory function but it perform other functions such as , &
- 8.According to the presence of hard exoskeleton in Arthropoda, appear new characters , , &
9. Cerebral ganglion of *Penaeus* gives nerves to , & 10. The Circulatory system of *Scorpion* is type & its heart consists of chambers .

(b) Choose: [6 Marks]

- 1.The body wall is dermo-muscular in
 - a) Annelida
 - b) Arthropoda
 - c) Mollusca
 - d)Not a ,b &c
- 2.The Optic units in Arthropods compound eye is :
 - a) Retina
 - b) Ommatidium
 - c) Ocellus
 - d) Labyrinth
3. The function of is removing air bubbles attached to gills .
 - a) Epipodite
 - b) Coxopodite
 - c) Endopodite
 - d) Basipodite

4. Anticoagulant secreted by *Hirudo* is.....

- a) Heparin
- b) Haemoglobin
- c) Hirudin
- d) Haematin

5. Unlike other annelids polychaetes usually lack :

- a) Parapodium
- b) a coelom
- c) Setae
- d) permanent gonads

6. Which of the following is modified appendage of mesosoma in *Scorpion*?

- a) Maxillae
- b) Uropodes
- c) Pecten
- d) Pedipalp

7. Seasonal dimorphism is a phenomenon found in:

- a) Oligochaeta
- b) Arthropoda
- c) Polychaeta
- d) Hirudinea

8. The function of Botryoidal tissue in *Hirudo* is.....

- a) Respiration
- b) Excretion
- c) protection
- d) Collecting food

9. Ventral blood vessel in Earth worm, is the mainvessel.

- a) Collecting
- b) Contractile
- c) Distributing
- d) Not a ,b &c

10. . *Scolopendrais* Opithogeneate animal this mean :

- a) Has posterior genital opening .
- b) Has two testis.
- c) Has one ovary
- d) Has posterior anus

11. The function of Clitellum in Clitellata is

- a) Secretes cocoon .
- b) Produces albumen
- c) Secretes mucus assists in transfer of sperm .
- d) All of these

12. Role of Typhlosole in the intestine of Earthworm is

- a) To control flow of blood
- b) To kill bacteria
- c) To increase absorptive surface
- d) All the above

II -Give a complete account about two only: [8 Marks]

- (a) Circulatory system of *Penaeus japonicus*
- (b) Copulation & formation of Cocoon in Earthworm .
- (c) i. Pseudohearts ii.Lung-book iii.Nephridium

Group (B)

I- Choose the correct answer:

(8 Marks)

1. The inner layer of the gastropod shell is called _____.
a. nacreous layer. b. prismatic layer. c. periostracum layer.
2. The heart consists of _____ in *Ancanthochiton*.
a. 2-chambered. b. 3-chambered. c. 4-chambered.
3. Excretion takes place by _____ in *Eremina*.
a. diffusion through the skin. b. one kidney. c. two kidneys.
4. Which of the following is suitable habitat for *Sepia*?
a. Marine water. b. Fresh water. c. Terrestrial.
5. The larva of *Anodonta* is called _____.
a. trochophore. b. veliger. c. glochidium
6. *Eremina* shell is _____.
a. one piece b. two pieces c. eight pieces
7. Which of the following molluscs has no eyes?
a. *Acanthochiton*. b. *Eremina*. c. *Sepia*.
8. The following species respire by gills except _____.
a. *Anodonta*. b. *Eremina*. c. *Sepia*.
9. Pearls are developed in certain species of _____.
a. Chitons. b. Echinoderms. c. Clams.
10. Usually water enters the mantle cavity of clams through _____.
a. exhalant siphon. b. inhalant siphon. c. mouth.
11. Which of the following systems is absent in echinoderms?
a. Digestive system. b. Excretory system. c. Reproductive system.
12. The locomotory organs of echinoderms are called _____.
a. pseudopodia. b. tube feet. c. arms.
13. Which of the following is suitable habitat for echinoderms?
a. Fresh water. b. Terrestrial. c. Marine water.
14. The body of Echinodermata is _____.
a. triploblastic. b. segmented. c. acoelomate.

تابع بقية الأسئلة في الخلف

15. Which of the following is an example of class Echinoidea?

- a. Sea cucumber. b. Sea urchin. c. Sea star.

16. Each sex of *Astropecten* has _____ gonads.

- a. four. b. five. c. ten.

II-Write “true” or “false” for each of the following sentences with error correction: (8 Marks)

1. The sex is separate in *Sepia*.
2. Mollusca have large coelome.
3. The shell is internal in *Anodonta*.
4. *Anodonta* belongs to Gastropoda.
5. The development is indirect in *Eremina*.
6. Trochophore is the larva of *Acanthochiton*.
7. *Acanthochiton* belongs to Polyplacophora.
8. The fertilization in *Acanthochiton* is external.
9. In *Sepia*, respiration takes place through skin.
10. A Freshwater habitat is a suitable habitat for *Eremina*.
11. The Sea star larva is called veliger.
12. The coelom of Echinodermata is large.
13. The adult Sea Star is radially symmetrical.
14. Sea Cucumber belongs to class Holothuroidea.
15. Animals with spiny skinned are called molluscs.
16. Most reproduction in echinoderms is sexually and internal.

III-Write about two only from the following:

(8 Marks)

1. Nervous system of *Anodonta*.
2. Digestive system of *Eremina*.
3. Reproductive system of *Astropecten*.

(With best wishes)

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د. داليا سعيد حمزة

1/1/2017

Answers

Part (1)

I- (a) Complete the following:-

[10 Marks]

1. Respiration in *Neries* takes place by simple diffusion while in *Panaeus* takes place by gills.
2. Coelom in Annelida performs different functions provides turgidity, acts as hydraulic skeleton & help in nutrition, excretion, respiration.
3. Serial homology means homologous structures modified in different ways to perform different functions while Autotomy means Automatic breaking off an appendage.
4. Nerve cord of *Scolopendra* consists of 21 ganglion while in *Scorpion* consists of 8 ganglion.
5. The Spermathecae of Earthworm are two pairs situated in segments 10 & 11 and they receive spermatozoa from another worm during copulation
6. Excretion in *Hirudo* takes place by 17 pairs of nephridia from these nephridia, there are 9 pairs called testicular nephridia
7. The blood of *Scolopendra* has no respiratory function but it performs other functions such as transport food, hormones carried about it, water content serves to withstand desiccation
8. According to the presence of hard exoskeleton in Arthropoda, appear new characters Presence of joints, ecdysis, reduced coelom & separation of muscles.
9. Cerebral ganglion of *Panaeus* gives nerves to eyes, antenna & antennules.
10. The Circulatory system of *Scorpion* is open type & its heart consists of seven chambers.

(b) Choose:

[6 Marks]

- | | | |
|---------------------------------------|------------------------|---------------------|
| 1. a) Annelida | 2. b) Ommatidium | 3. a) Epipodite |
| 4. c) Hirudin | 5. d) permanent gonads | 6. c) Pecten |
| 7. c) Polychaeta | 8. b) Excretion | 9. c) Distributing |
| 10. a) Has posterior genital opening | | 11. d) All of these |
| 12. c) To increase absorptive surface | | |

II – Give a complete account about two only: [8 Marks]

(a) Circulatory system of *Panaeus japonicus*.

Open circulatory system. The body cavity is largely haemocoelic. The heart lies within pericardial sinus. Respiratory pigment is haemoglobin & blood is red. The heart is hexagonal, pierced by three pairs of ostia.

The blood leaves the heart through 5 arteries anterior & one artery posterior. Ophthalmic to the eyes, 2 Antennary to antennule & antennae, 2 hepatic to the digestive gland.

Abdominal artery :

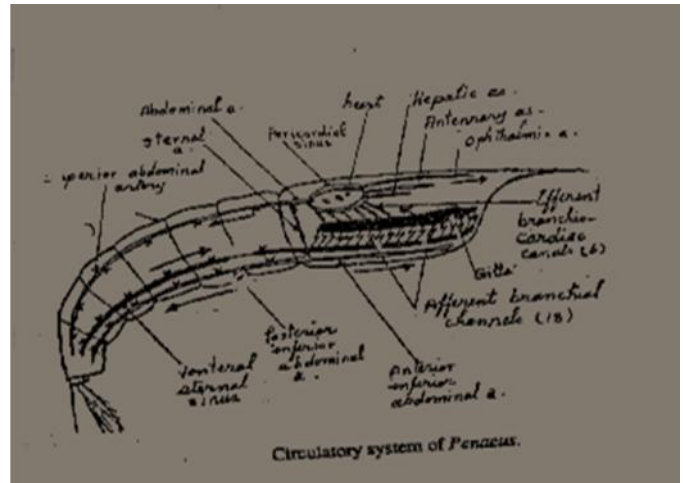
arises posteriorly and splits into :

Superior abdominal artery and Sternal artery

All these arteries branch extensively in the various organs , All the vessels have open ends and communicate with a system of sinuses .

The sinuses communicate with the sternal sinus .

Sternal sinus sends 18 channels to gills to be aerated , 6 main branchiocardiac open into the heart

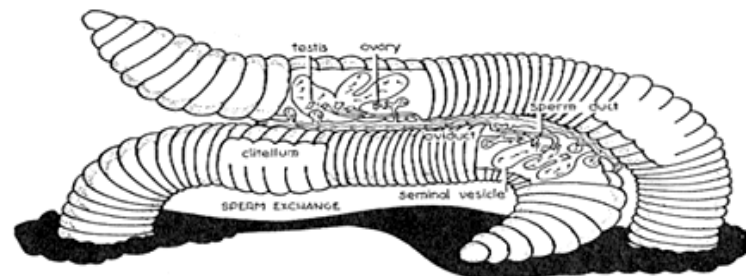


(b) Copulation & formation of Cocoon in Earthworm.

The earthworm reproduces sexually throughout most of the year, **cross fertilization** always occurs. Copulation involves the **mutual exchange** of spermatozoa between two worms, which then separate and later on form cocoons in which fertilization of the eggs and development of the embryos take place. The two worms appose the ventral surface of their anterior parts and cling to each other by their chaetae, with their heads pointing in opposite directions and the clitellum of each worm lying opposite to the region of the spermathecal pores of the other worm. The spermatozoa are then squeezed out of the male genital openings(segment 15) of each of the two worms and are carried backwards along temporary longitudinal seminal grooves to the region of the clitellum, where they become forced into the spermathecae of the other worm. The two worms then separate.

When the eggs are ripe, the clitellum of each worm secretes a mucous tube around itself, the **cocoon**, and fills it with albumen secretion from its glands. This cocoon is then forced to glide forwards by muscular contraction of the body behind it. As the cocoon passes over the female genital openings(segment 14) few eggs are discharged into it, then as it passes further forwards over the spermathecal pores, it receives some of the spermatozoa which are stored in the spermathecae. Finally the worm slips out of the cocoon, closes it at both ends, and leaves it in the soil.

Fertilization occurs inside the cocoon, and the zygotes develop into young worms which later on escape from the cocoon



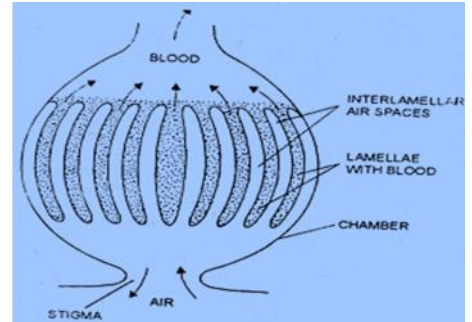
(c) i. **Pseudoheart** ii. **Lung-book** iii. **Nephridium**

i. The pseudohearts found in the Circulatory system of Earth worm, there are 5 pairs of transverse contractile vessels running on both sides of the oesophagus in segments 6-10, connecting the dorsal blood vessel with the ventral blood vessel, These hearts contain valves to regulate the direction of movement of the blood .

ii. Lung-book :

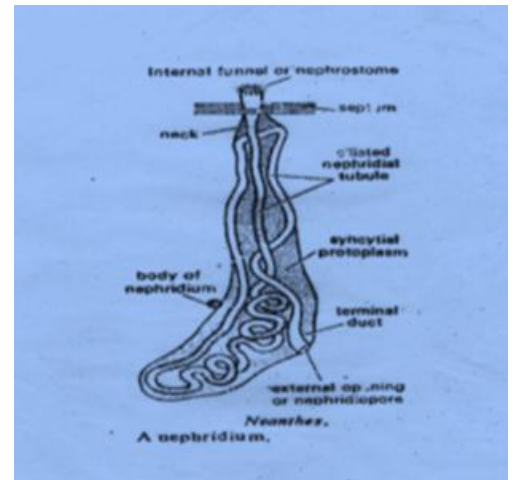
Respiration of Scorpion takes place by four pairs of lung books, they open on segments (3-6) of the mesosoma by stigmata. Each lung book is formed of air chamber with numerous lamellae which project into a haemocoelic sinus and in the internal space of these lamellae blood circulates

respiratory exchange takes place through thin walls of lamellae



iii. Nephridium

Excretion of Annelida takes place by nephridia. Each nephridium has oval syncytial mass of protoplasm containing a long, convoluted, ciliated canal, the **nephridial tubule** (highly convoluted and mostly ciliated tubule). it opens internally by a ciliated funnel or **nephrostome**. Posteriorly the tubule opens externally by a contractile **nephridiopore**. The chief nitrogenous waste is ammonia. Nephridia collect waste from coelomic fluid and blood by diffusion. The nephridia also possess the power of **osmoregulation**.



Group (B)

I- Choose the correct answer:

(8 Marks)

1. a. nacreous layer.
2. b. 3-chambered.
3. b. one kidney.
4. a. Marine water.
5. c. glochidium
6. a. one piece
7. a. *Acanthochiton*.
8. b. *Eremina*.
9. c. Clams.
10. b. inhalant siphon.
11. b. Excretory system.
12. b. tube feet.
13. c. Marine water.
14. a. triploblastic.
15. b. Sea urchin.
16. c. ten.

II-Write “true” or “false” for each of the following sentences with error correction:

(8 Marks)

- | | |
|---|-------|
| 1. The sex is separate in <i>Sepia</i> . | True |
| 2. Mollusca have large coelome.
Mollusca have reduced coelome.
Or: Echinodermata have large coelome. | False |
| 3. The shell is internal in <i>Anodonta</i> .
The shell is external in <i>Anodonta</i> .
Or: The shell is internal in <i>Sepia</i> . | False |
| 4. <i>Anodonta</i> belongs to Gastropoda.
<i>Anodonta</i> belongs to Bivalvia.
Or: <i>Eremina</i> belongs to Gastropoda. | False |
| 5. The development is indirect in <i>Eremina</i> .
The development is direct in <i>Eremina</i> .
Or: The development is indirect in <i>Acanthochiton</i> and <i>Anodonta</i> . | False |
| 6. Trochophore is the larva of <i>Acanthochiton</i> . | True |
| 7. <i>Acanthochiton</i> belongs to Polyplacophora. | True |
| 8. The fertilization in <i>Acanthochiton</i> is external. | True |

9. In *Sepia*, respiration takes place through skin. **False**
In *Sepia*, respiration takes place through two gills.
Or: In *Eremina*, respiration takes place through skin.
10. A Freshwater habitat is a suitable habitat for *Eremina*. **False**
A Freshwater habitat is a suitable habitat for *Anodonta*
Or: A Terrestrial habitat is a suitable habitat for *Eremina*.
11. The Sea star larva is called veliger. **False**
The Sea star larva is called bipinnaria.
12. The coelom of Echinodermata is large. **True**
13. The adult Sea Star is radially symmetrical. **True**
14. Sea Cucumber belongs to class Holothuroidea. **True**
15. Animals with spiny skinned are called molluscs. **False**
Animals with spiny skinned are called echinoderms.
Or: Animals with soft skinned are called molluscs.
16. Most reproduction in echinoderms is sexually and internal. **False**
Most reproduction in echinoderms is sexually and external.

III- Write about two only from the following:

(8 Marks)

1. Nervous system of *Anodonta*.

Four pairs of nerve ganglia are recognized in this system: two cerebral ganglia and two pleural ganglia (fused into two cerebropleural ganglionic masses found on either side of the esophagus), two pedal ganglia in the foot, and two visceral ganglia in the visceral hump. The sense organs are poorly developed. There are no eyes, but pair of statocysts lie close to the pedal ganglia. The edges of the inhalant and exhalant siphons also have sensory cells which respond to touch and light.

2. Digestive system of *Eremina*.

A snail's digestive system starts with its buccal mass, or its mouth, which is used to take in food. Snails have jaws inside their mouth to cut off bits of food. Snails also have a radula, a ribbon-like tongue, covered with horn-shaped teeth. The radula grinds up food by moving back and forth rapidly while the jaw holds the food in place.

The mouth connects to the esophagus. The food enters the esophagus when it swallows the food. The food goes into the crop, a place where salivary glands are found. There are bacteria in the crop which helps the snail digest cellulose. The food enters the sack-shaped stomach, which is an extension of the crop. The food is also digested here. The food enters the intestine. Useful nutrients are absorbed into the large intestine. Undigested food exits the snail through the anus.

3. Reproductive system of *Astropecten*.

The gonads consist of a pair of strands in each arm from which the germ cells are proliferated so that they come to be contained in thin walled sacs hanging in the coelom. They vary greatly in size according to the season and at maturity may occupy a considerable portion of the perivisceral space.

The gonads of each arm discharge to the exterior by fine pores situated at the junction of the arms with the disk. The sexes are separate and approximately equal in numbers and the germ cells are discharged freely into the sea where fertilization takes place and leads to the formation of a characteristic larva. At first this is bilaterally symmetrical and relatively simple and is known as a bipinnaria, later the bipinnaria develops very complex ciliated bands before settling down and metamorphosing into the adult radially symmetrical form.