YAKEEN NEET 2.0

2026

19.06.2025

STRUCTURAL ORGANISATION IN ANIMALS

ZOOLOGY

Lecture – 14

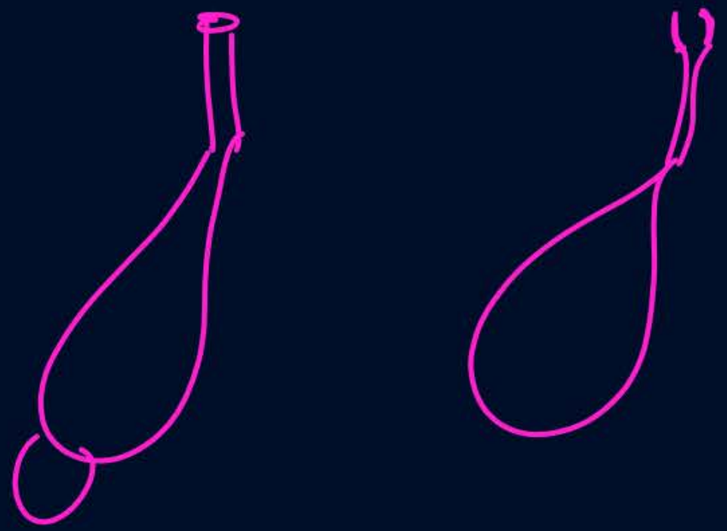
By- SAMAPTI MAM

Topics to be covered

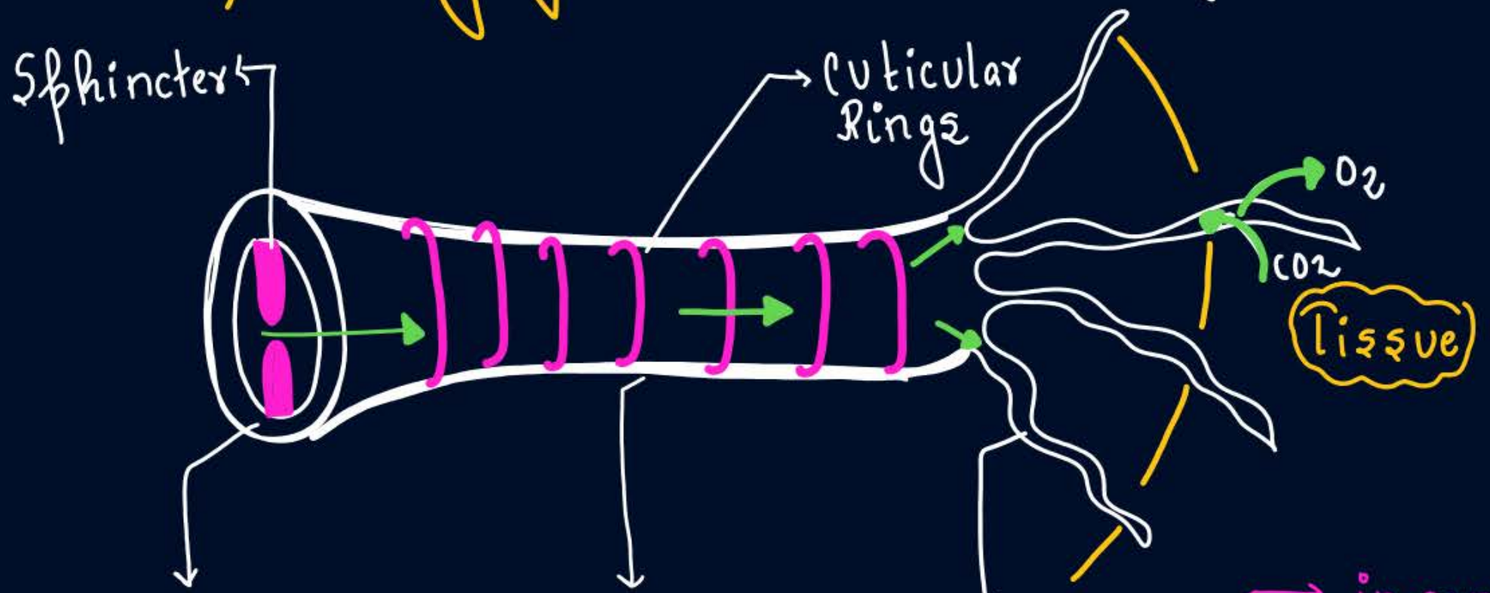
1. COCKROACH- RESPIRATORY, CIRCULATORY, EXCRETORY SYSTEM, Nervous system
2.
3.
4.

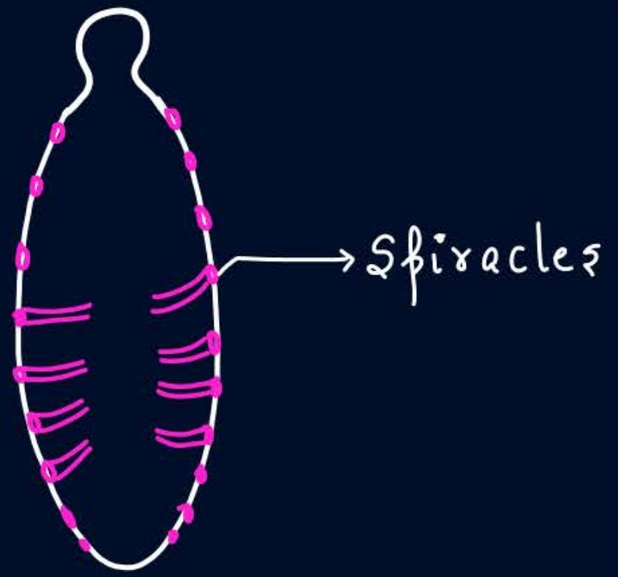
MY TELEGRAM

#2amnphiexpress



Respiratory system : K/a Tracheal system





Spiracle → Air → Trachea → Air → Tracheole

(10 pair)

- Lateral side
- Guarded by 'SPHINCTER'
  - ↓
  - regulate movement of air

→ in contact with tissue

→ simple diffusion occurs thru this

The respiratory system consists of a network of trachea, that open through 10 pairs of small holes called spiracles present on the lateral side of the body. Thin branching tubes (tracheal tubes subdivided into tracheoles) carry oxygen from the air to all the parts. The

opening of the spiracles is regulated by the sphincters. Exchange of gases take place at the tracheoles by diffusion.

Circulatory System:

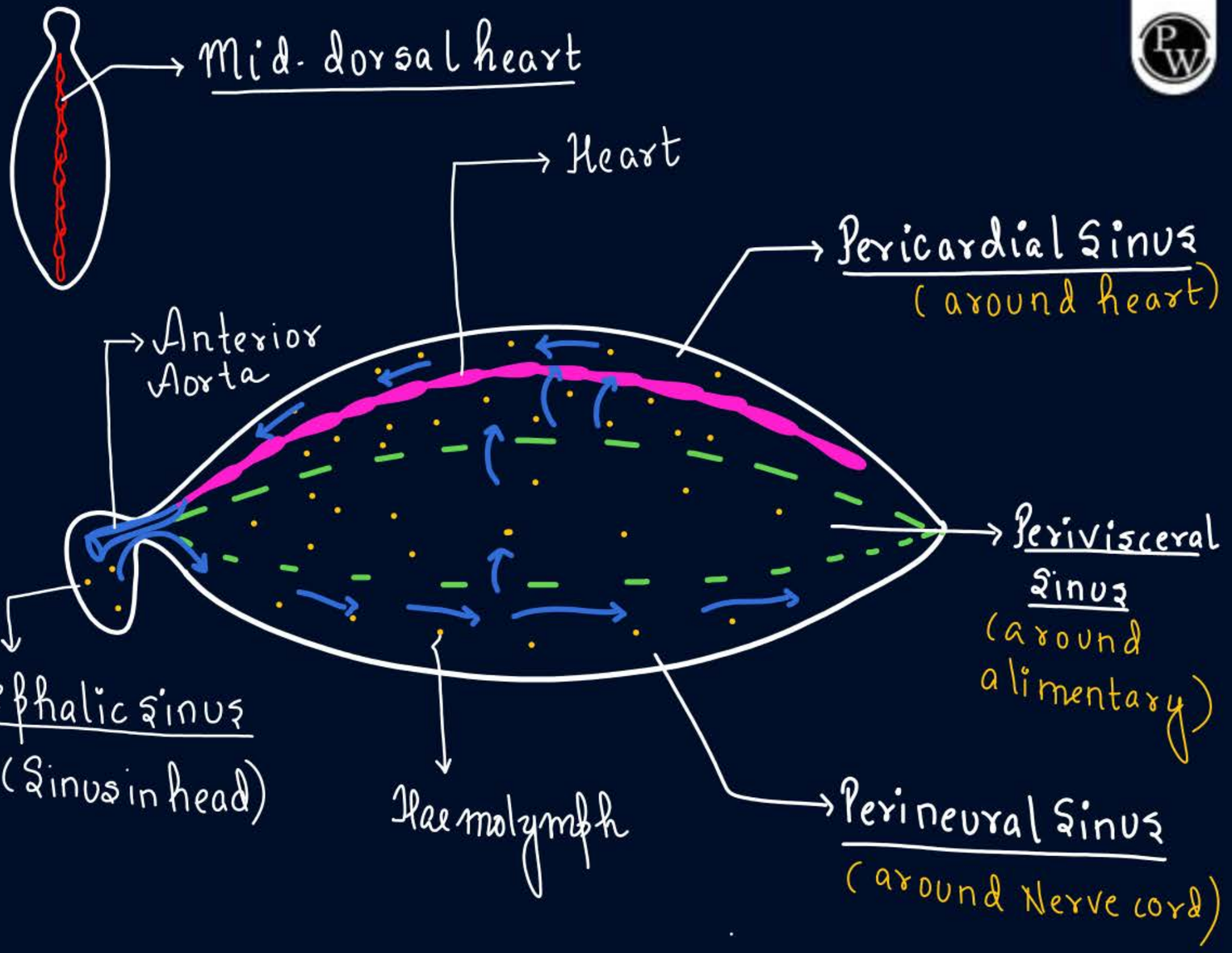
→ **OPEN Circulatory system**: Poorly developed & Blood (haemolymph) is present in open space K/a HAEMOCOEL / SINUSES.

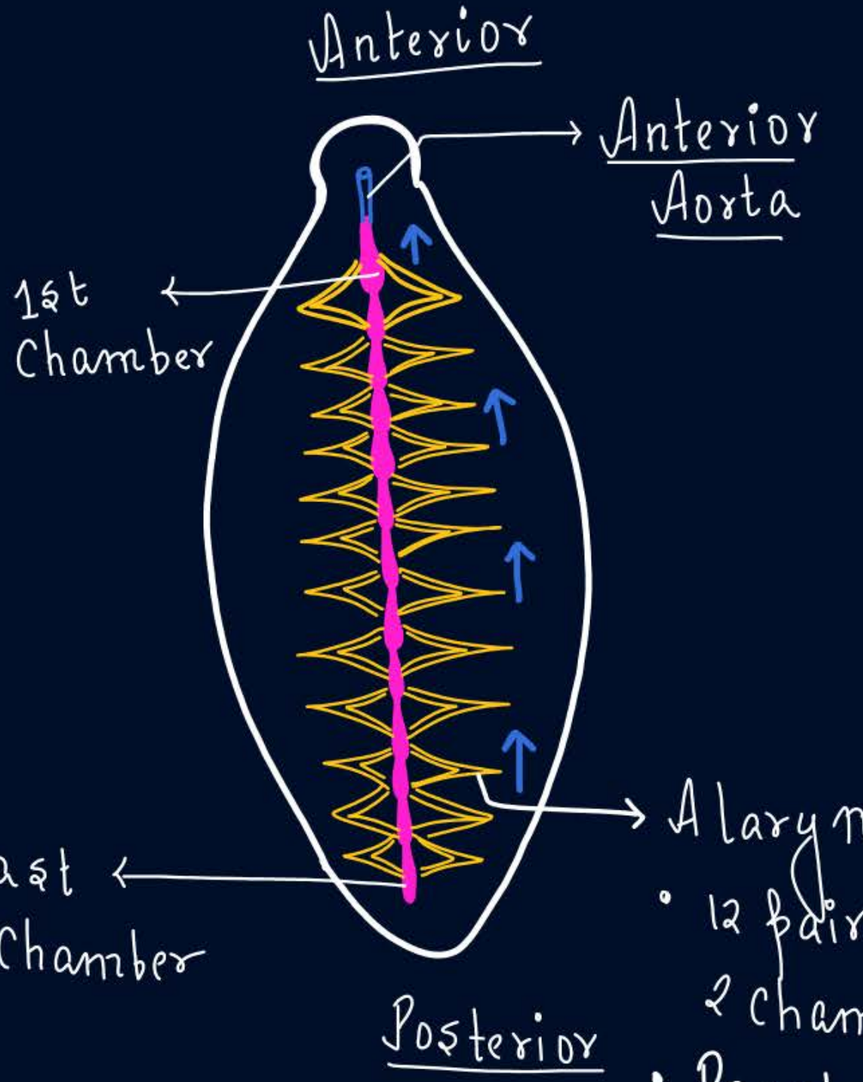
→ Circulatory system
- ① Heart
- ② Haemolymph
- ③ Anterior Aorta

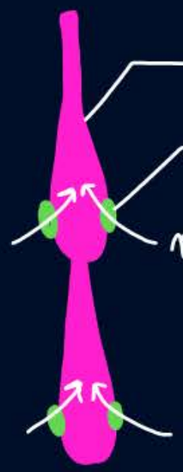
Heart

→ 13 Chambered, muscular tube present MID-DORSALLY.

→ The chambers are Funnel shaped with openings c/a OSTIA present on either side for entry of haemolymph







- Alary muscle
  - 12 pair, 1 pair b/w 2 chamber
- Regulates movement of haemolymph via OSTIA

Note

Pericardial sinus → haemolymph → OSTIA → Heart (pumps, posterior ← to anterior) → Ant. Aorta → Cephalic sinus

Haemolymph: .Colorless Blood

- Present in haemocoel/Sinus
- It has Plasma + Haemocytes (Blood cell)
- It has no Role in transport of gases.

Blood vascular system of cockroach is an open type (Figure 7.17). Blood vessels are poorly developed and open into space (haemocoel). Visceral organs located in the haemocoel are bathed in blood (haemolymph). The haemolymph is composed of colourless plasma and haemocytes. Heart of cockroach consists of elongated muscular tube lying along mid dorsal line of thorax and abdomen. It is differentiated into funnel shaped chambers with ostia on either side. Blood from sinuses enter heart through ostia and is pumped anteriorly to sinuses again.

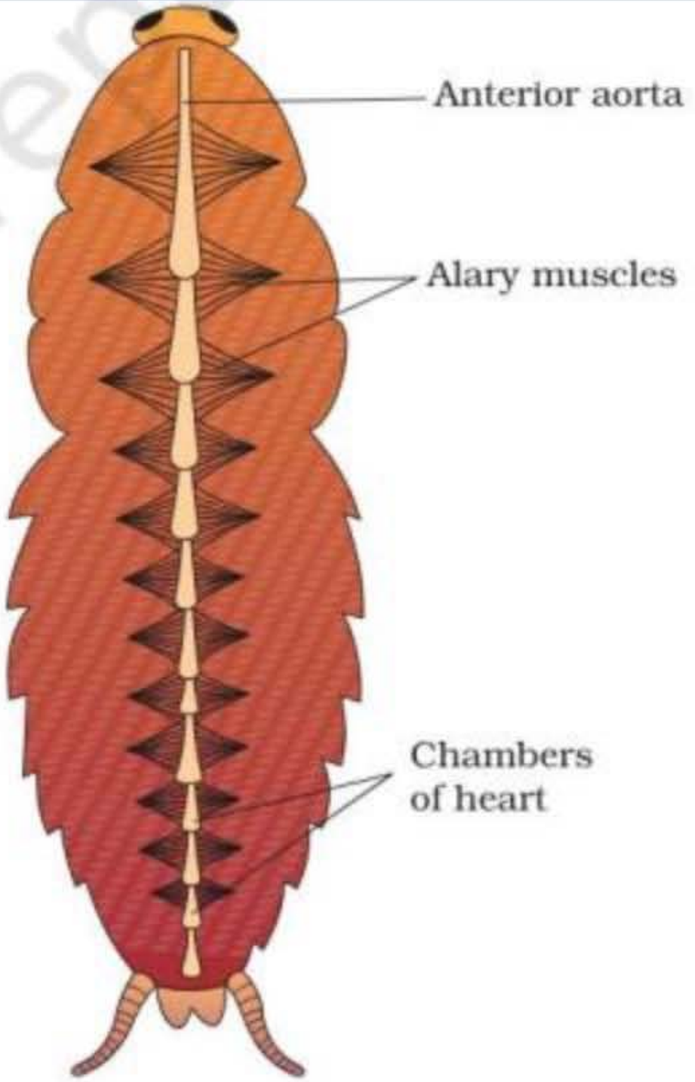


Figure 7.17 Open circulatory system of cockroach

Excretion is performed by Malpighian tubules. Each tubule is lined by glandular and ciliated cells. They absorb nitrogenous waste products and convert them into uric acid which is excreted out through the hindgut. Therefore, this insect is called **uricotelic**. In addition, the fat body, nephrocytes and urecose glands also help in excretion.

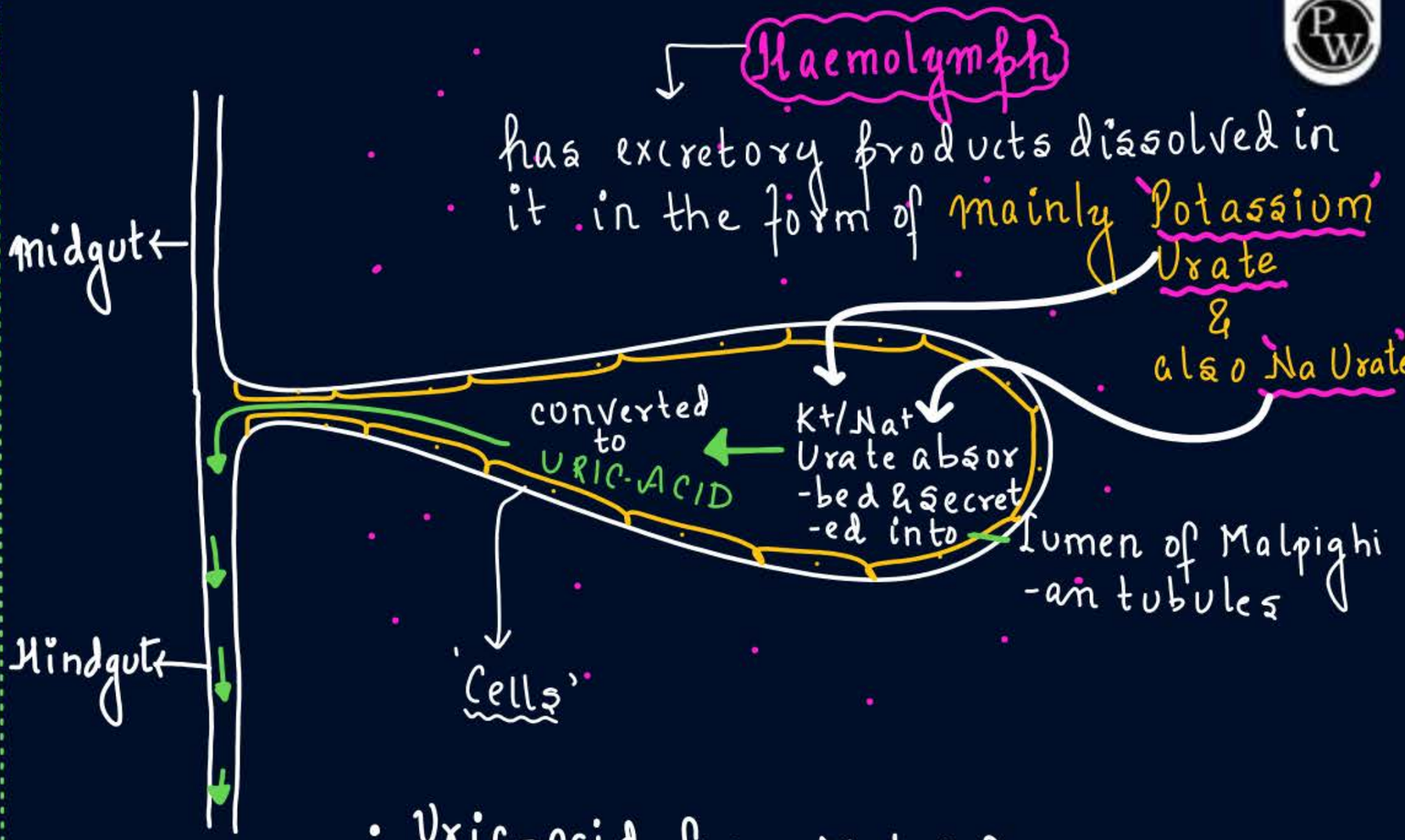
The nervous system of cockroach consists of a series of fused, segmentally arranged ganglia joined by paired longitudinal connectives on the ventral side. Three ganglia lie in the thorax, and six in the abdomen. The nervous system of cockroach is spread throughout the body. The head holds a bit of a nervous system while the rest is situated along the ventral (belly-side) part of its body. So, now you understand that if the head of a cockroach is cut off, it will still live for as long as one week. In the head region, the brain is represented by supra-oesophageal ganglion which supplies nerves to antennae and compound eyes. In cockroach, the sense organs are antennae, eyes, maxillary palps, labial palps, anal cerci, etc. The compound eyes are situated at the dorsal surface of the head. Each eye consists of about 2000 hexagonal ommatidia (sing.: *ommatidium*). With the help of several ommatidia, a cockroach can receive several images of an object. This kind of vision is known as mosaic vision with more sensitivity but less resolution, being common during night (hence called nocturnal vision).

Excretory system:

- Excretory structures are:
  1) Malpighian tubules
  2) Nephrocytes
  3) Urecose gland (only in ♂)
  4) fat bodies

Malpighian tubules:

- 100 - 150 in No., yellowish, Located at the junction of midgut & Hindgut
- It is lined by ciliated & glandular cells.

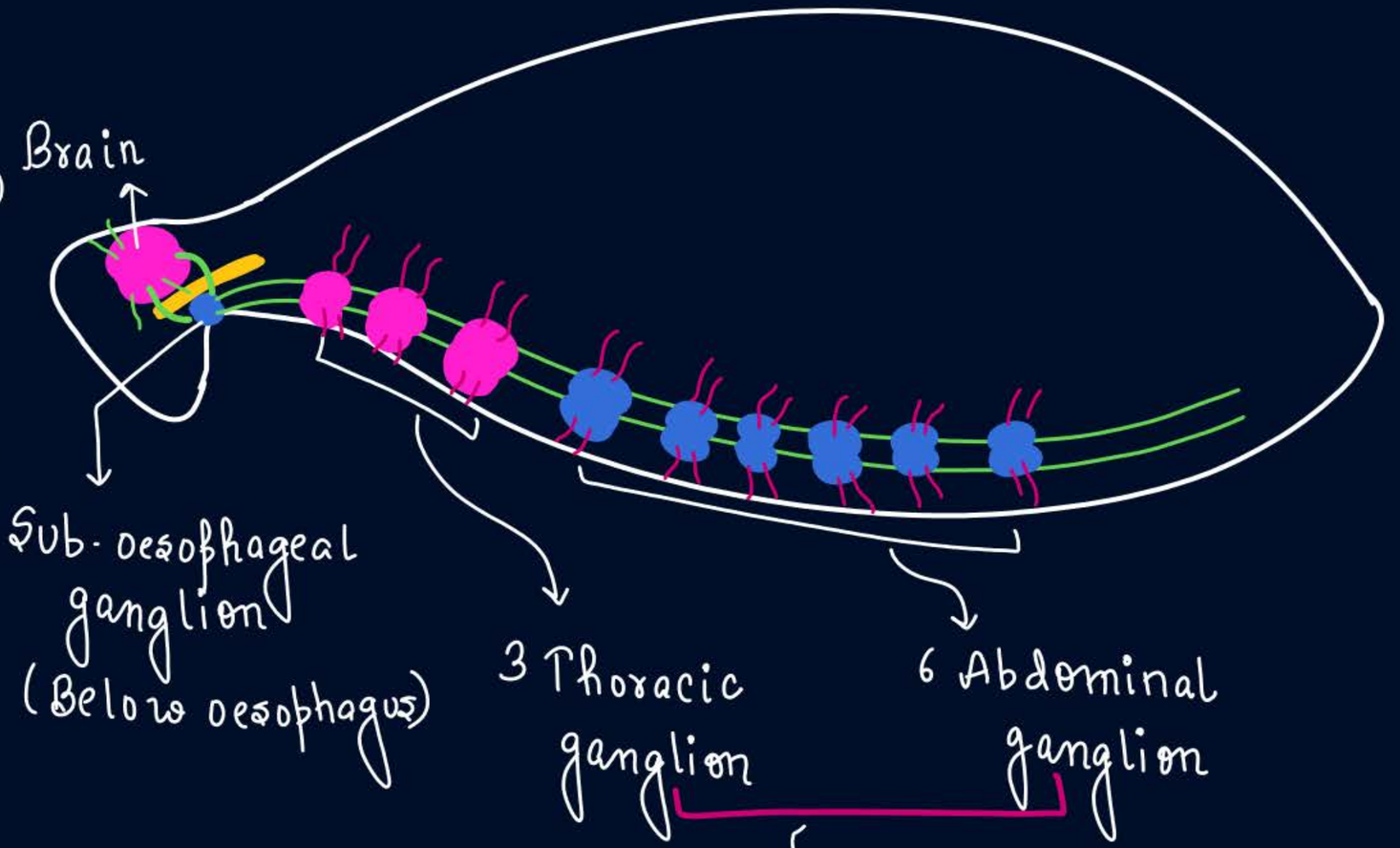


- Uric-acid from Malpighian tubule eliminated via hindgut to outside:

URICOTELIC ANIMAL

Nervous system:

- Mainly present: `VENTRALLY`
- Brain: `SUPRA-OESOPHAGEAL`
  - GANGLION (above oesophagus)
    - Collection of cell Bodies
    - Nerves from here controls Antennae, Compound eye, some mouth part (not in NCERT)
- Connected to Suboesophageal ganglion
  - Double Ventral Solid Nerve cord
    - Along this, 3 thoracic & 6 abdominal ganglion



Nerves arising from controls major portion the Body.

Note If we cut the Head → can still survive for 1 week

↓

Since Head/Brain has less control, major control by Ventral/Belly region where Nerve cord & ganglion located majorly.

Q-1. READ THE FOLLOWING STATEMENT AND CHOOSE THE CORRECT ANSWER

STATEMENT 1- Gizzard has an outer layer of thick circular muscles and thick inner cuticle forming six highly chitinous plate called teeth.
STATEMENT 2- The midgut is broader than hindgut and hindgut is differentiated into ileum, colon and rectum.

1. Statement I is correct but Statement II is incorrect.
2. Statement I is incorrect but Statement II is correct.
3. Both Statement I and Statement II are correct.
4. Both Statement I and Statement II are incorrect.

In the heart of the cockroach, if the "ostia" were permanently sealed, the most immediate and significant consequence for the circulatory flow would be:

(A) Haemolymph would be able to be pumped anteriorly by the heart normally.

(B) The heart would cease to be an elongated muscular tube.

(C) Haemolymph from the haemocoel/sinuses would be prevented from entering the heart chambers.

(D) The fan-shaped Alary muscles would lose their function.

QUESTION

Given below are two statements.

Statement I: Gizzard helps in grinding the food particles.

Statement II: Gizzard has an inner layer of thick circular muscles and thin outer cuticle forming six highly chitinous plates called teeth.

In the light of the above statements, choose the most appropriate answer from the options given below.

1. Statement I is correct but Statement II is incorrect.
2. Statement I is incorrect but Statement II is correct.
3. Both Statement I and Statement II are correct.
4. Both Statement I and Statement II are incorrect.

QUESTION

Assertion(A): In cockroach exchange of gases occurs at tracheoles by diffusion.
Reason(R): In the respiratory system of cockroach, trachea which opens through 12 pairs of small holes called spiracles present on the lateral side of the body.

1. Both Assertion (A) and Reason (R) are true, and Reason (R) is a correct explanation of Assertion (A).
2. Both Assertion (A) and Reason (R) are true, but Reason (R) is not a correct explanation of Assertion (A).
3. Assertion (A) is true, and Reason (R) is false.
4. Assertion (A) is false, and Reason (R) is true.

Which of the following is characteristic feature of cockroach regarding sexual dimorphism? (2023 NEET)

1. Presence of sclerites
2. Presence of anal cerci
3. Dark brown body colour and anal cerci
4. Presence of anal styles

QUESTION

Cockroaches are;

1. nocturnal and herbivores.
2. diurnal and carnivores.
3. nocturnal and omnivores.
4. diurnal and herbivores.

QUESTION

In female cockroaches, the 7th sternum is P---------shaped and together with the 8th and 9th sterna forms a , Q ----------.
Identify P and Q so as to complete the given statement.

1. P – round, Q – brood pouch
2. P – boat, Q– genital pouch
3. P – boat, Q – ootheca
4. P – oval, Q – genital pouch

QUESTION

Which of the following characteristics is incorrect with respect to cockroach?

1. 6-8 pair of gastric caeca is present at the junction of foregut and midgut.
2. Hypopharynx lies within the cavity enclosed by the mouth parts.
3. 10th abdominal segment in both sexes, bears a pair of anal cerci.
4. In each segment, exoskeleton has hardened plates called sclerites.

Homework

- REVISE CLAASNOTES / ZOOLOGY MED EASY

MODULE HW
Module -2
AARAMBH-3,4,
Prarambh exercise 1- 9,10,11,
PARIKSHIT EX3- 1-4,7,9

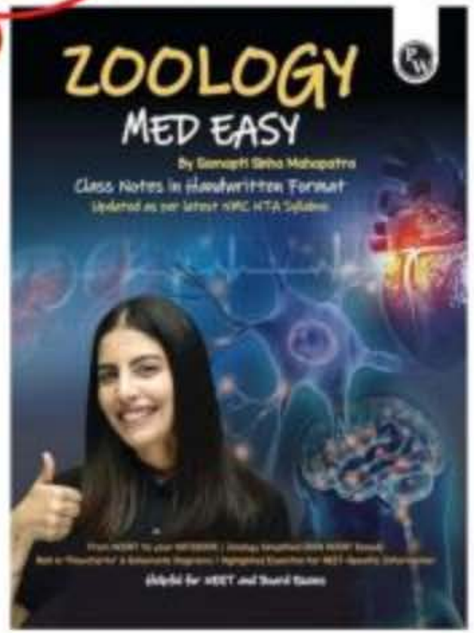
Samapti Sinha Mahapatra

PW Zoology Med Easy For NEET and Board Exams 2024-25 | Flowcharts, Schematic Diagrams Samapti Sinha Mahapatra Handwritten Notes

20 May 2024
ISBN-13: 978-9360345068 ISBN-10: 9360345067

#1 Best Seller n AIIMS & NEET Exams

14% off



THANK YOU