

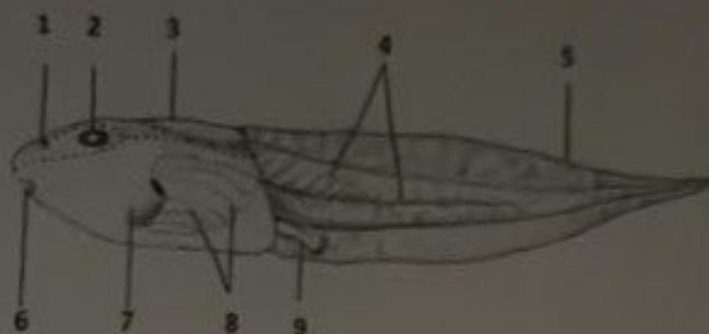


INTERIM JOINT MATRICULATION BOARD
AHMADU BELLO UNIVERSITY
ZARIA

INTERIM JOINT MATRICULATION BOARD EXAMINATIONS 2024
SUBJECT: BIOLOGY PAPER III (ALTERNATIVE A)
DATE SCHEDULED: THURSDAY 18TH JULY, 2024
TIME ALLOWED: THREE HOURS (3 HRS)

INSTRUCTIONS Answer all questions in the same booklet.

1. SPECIMEN A



(a)

- i. Suggest an appropriate title for Specimen A.
- ii. Label the parts/structures numbered 1 - 9.
- iii. Mention three (3) morphological adaptations of Specimen A.
- iv. Give four modifications that occur in Specimen A to develop to adult stage.
- v. Name two behaviours engaged by Specimen A in its habitat.
- vi. What is the most predominant type of feeding of Specimen A.
- vii. Name the taxonomic order of Specimen A.

(b). Observe Specimens B and C.

- i. Name the taxonomic class, order, family and genus of Specimens B and C.
- ii. Give four (4) characteristics of Specimen B.
- iii. Make a labeled diagram of 7 - 9 cm of the lateral view of Specimen B.
- iv. In a tabular form give two (2) morphological differences and similarities between Specimens B and C.
- v. Outline four (4) factors that attract Specimen B to humans.

2. a) Make a labeled diagram of 7 - 9 cm of the lateral view of Specimen C
- b) Give four (4) characteristics of Specimens C.

2024 IJMBE BIOLOGY III A contd.

You are provided with Specimen D.

- c) Identify Specimen D without any reason.
 - d) Name the taxonomic phylum, class, order and family of Specimen D.
 - e) Name the structure for gaseous exchange in Specimen D.
 - f) Outline four (4) economic importance of Specimen D.
 - g) Using a sharp scalpel, cut open the lateral side from the anus to the operculum of Specimen D to show the alimentary canal system. Draw a labeled diagram of 7 - 8 cm of the alimentary canal system.
3. Specimens F,G and H are inflorescences provided. Study them carefully and use them to answer the questions that follow:

- a) i. State the type of inflorescence in each case
 - ii. What are the likely pollinating agents for F and G.
- b) Specimen I is provided. Observe it carefully and answer the questions that follow:
- i. Draw and label the entire specimen
 - ii. Classify the specimen to generic level

State one prominent feature of the specimen which enables it to survive in its environment

4a. specimens J,K and L are provided. Study them carefully and answer the questions that follow:

State the habitat for each specimen

State one feature that makes each specimen adapted to its habitat

b. specimen M is provided in your question paper. Use it to answer the questions which follow.

- i. Identify the specimen
- ii. Label the parts numbered 1 -10

Give two functions of the part labeled 9.

4b. A food specimen is provided in the laboratory in your school, on your experimental bench you are also provided with iodine solution, nitric acid, Fehling's solution, Sudan III solution and plain sheets of paper. How will you determine the presence of starch, glucose, protein and lipids in the food specimen? Tabulate your answer in the format below:

QUESTION 1

Q (i) Specimen A is a Tadpole

(a) 1 → nostril

2 → eye

3 →

4 → Tail muscle

5 →

6 → mouth or oral disc

7 → spiracle

8 → feathery external gill

9 → ~~feathery external gill~~ hind limb

QUESTION 1 contd.

(a) (v) Schooling: Tadpoles aggregate in schools, possibly for protection

Swimming: Tadpoles are skilled swimmers

(vi) Herbivory

(vii) Amura

BIOLOGY

(b) (i)

Specimen	B	C
Class	Insecta	Insecta
Order	Diptera	Diptera
Family	Culicidae	Muscidae
Genus	Anopheles	Musca

(ii) — — — Insect diagram — — —

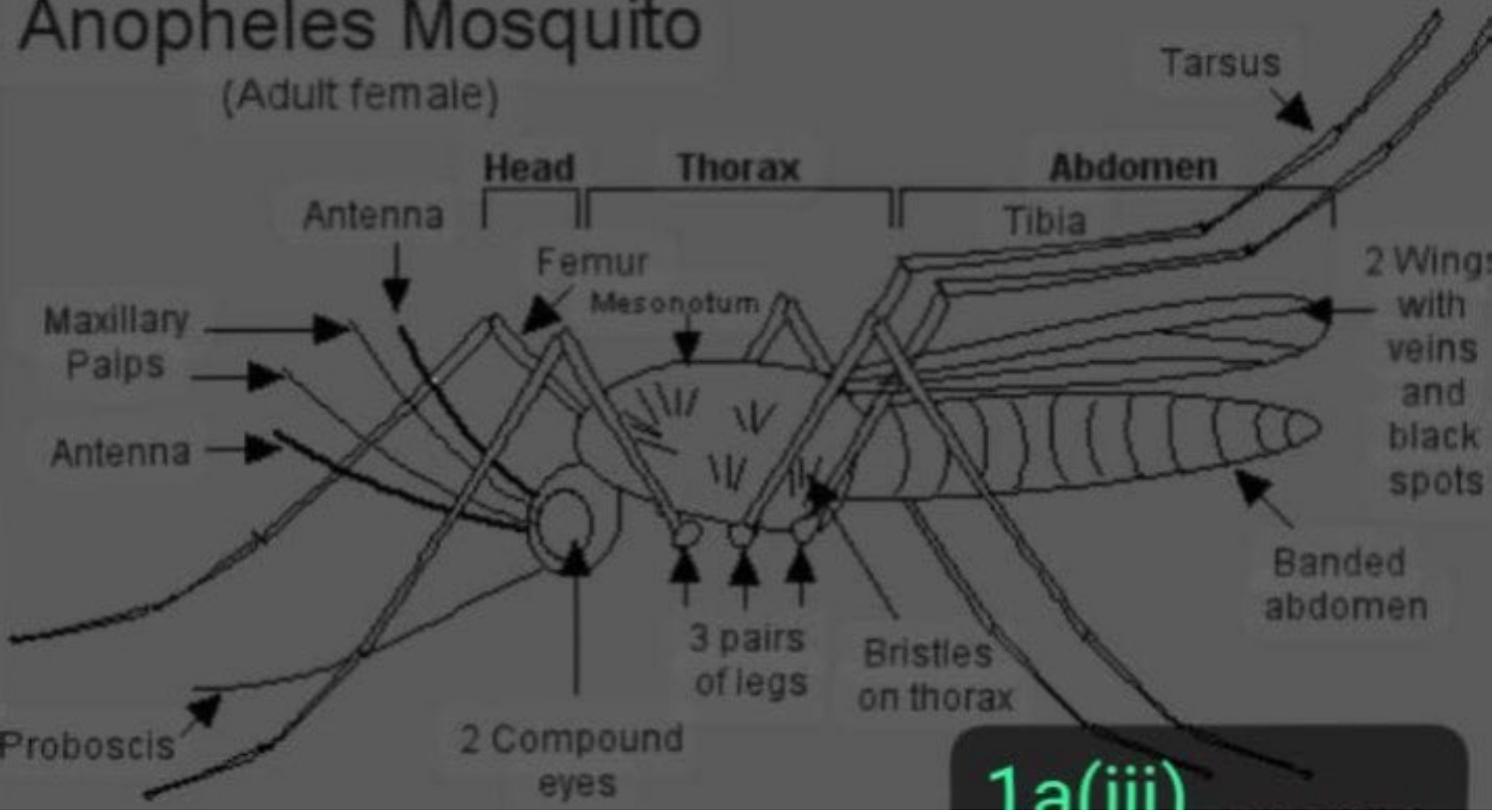
(c)

B	C
<ul style="list-style-type: none">• Narrow wings with setae ^{scales}• Palps are present near the mouthparts	<ul style="list-style-type: none">• Broad wings without scales• Palps are absent or rudimentary.

- (d)
- Release of CO_2
 - Warmer body temperature
 - Lactic acid produced on skin
 - Hair acid present in lower part

Anopheles Mosquito

(Adult female)



1a(iii)

QUESTION 2

Biology

(a) --- Insert diagram ---

- (b)
- Houseflies have a long, stout and oval shaped body
 - They have broad, transparent wings with a distinctive venation pattern
 - Have spongy mouth parts adapted for sucking up liquids
 - Houseflies exhibit complete metamorphosis

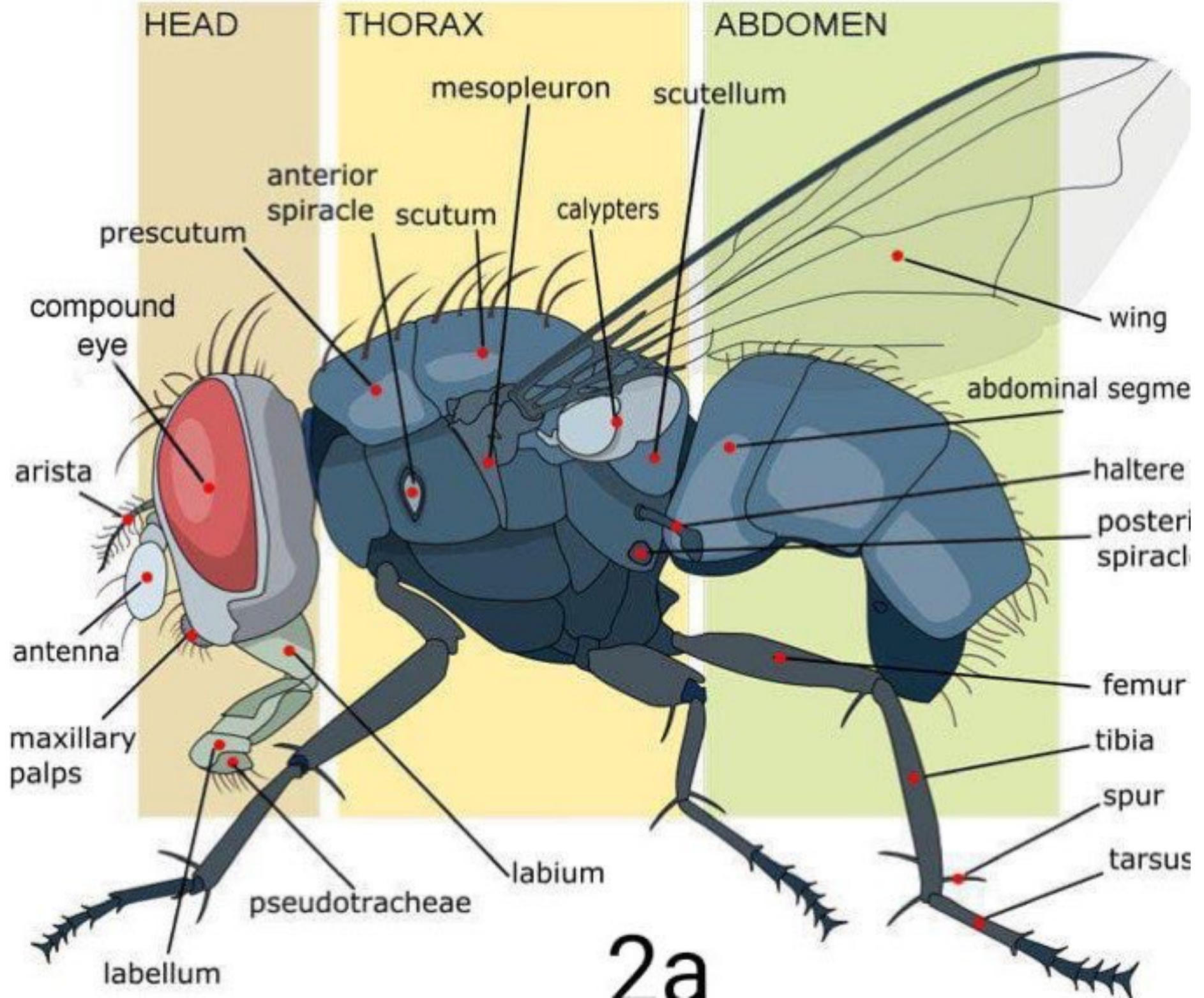
(c) Tilapia

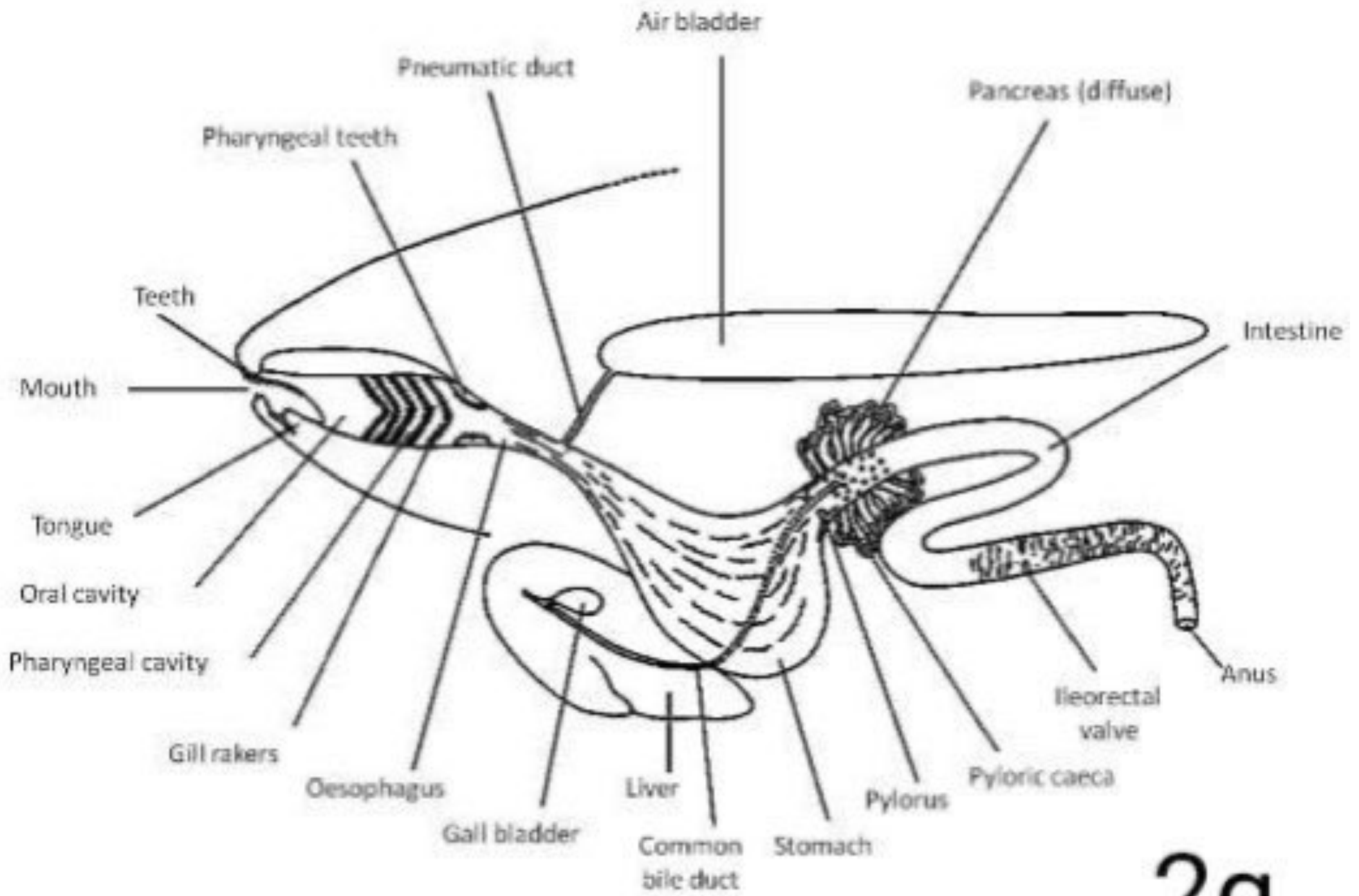
(d) phylum → Chordata order → Perciformes
class → Actinopterygii family → Cichlidae

(e) Gill

- (f)
- Generates revenue
 - Tilapia farming provide employment opportunities
 - It's a source of food, especially protein.
 - Tilapia farming contributes to rural development.

(g) --- Insert diagram ---





2g

QUESTION 3

- (a) (i) F → Capitulum inflorescence
G → Panicle inflorescence
H → Spike inflorescence

- (ii) F → Bees
G → Bats

(b) (i) Insert ----- diagram -----

- (ii) Kingdom → Plantae
Division → Marchantiophyta
Class → Marchantiopsida
Order → Marchantiales
Family → Marchantiaceae
Genus → Marchantia

Rhizoids help it to anchor to the substrate and help to absorb water and nutrients.

BIOLOGY

3b(i)

Capsule

Stalk

Leaf-like parts

Rhizoids



QUESTION 4

- (a) shoot of Typha → water
shoot of water lily → water
shoot of water lettuce → Air

- (b) ⇒ ~~long~~ flat, sword-shaped leaves for Typha
⇒ Air spaces and hairs for the water ~~lily~~ lettuce
⇒ long flexible petiole for the water lily.

(c) (i) Transverse section of a leaf

(ii) 1 → Cuticle

2 → Upper epidermis

3 → Palisade cells

4 → Bundle sheath

5 → Xylem

6 → Phloem

7 → Spongy cells

8 → Bundle sheath extension

9 → Stomata

10 → Lower epidermis

- The stomata helps in the transpiration of water
- It allows for the exchange of gases between the plant and the atmosphere

QUESTION 4 contd

Test	Observation	Inference
Add 2 drops of iodine solution to food substance	substance turns blue black	starch present
Add a few drops of Fehling's solution to food substance and heat	A brick-red precipitate is obtained	Glucose is present
Add 3 or 4 drops of nitric acid to the food substance	Intense yellow colouration is formed on the substance	Protein is present
Drop some of the food substance on a plain sheet of paper	A translucent grease spot is formed	Fats and oil present
shake some of the food substance with water and add 4 to 5 drops of Sudan III stain	The oil in the food substance is stained red.	Fats and oil confirmed.