EXPERIMENT TEST – PART 2

Total time: 120 minutes (02 parts)

Printed name: …….. ID: ……

Instructions:

- Do not open the test booklet until you are told to do so.
- Be sure that your name and ID are written on spaces provided.
- **Only write your answers in the ANSWER SHEET provided.**
- Use blue / black pens or pencils to write your answers.
- Diagrams are not drawn to scale. They are intended as aids only.
- After the contest, the invigilator will collect all the contest papers.

Introduction

The mollusks are interesting animals, with the number of species ranked second only to the arthropods. Snail and clam are two familiar groups belong to mollusks. In biology, an organism is classified and grouped into species, genus, family, order... based on their characteristics. In order to study the diversity of mollusk, you need to be familiar with their morphological characteristics that is the aim of the experiments.

In binomial nomenclature system, a species name consists of two parts. The first part of the name is the generic name, which identifies the genus to which the species belongs. The second part of the name is the specific name, which identifies the species within the genus. In writings, the first letter of the generic name needs to be upper case, the first letter of the specific name needs to be lower case and both words needs to be italic or underlined when handwritten. Example: *Sermyla tornatella*

Caution: The mollusk specimens used in these experiments may have sharp edges, you should handle them with care.

EXPERIMENT 1: In this experiment, candidates will identify the scientific name of some freshwater snails based on shell morphological characteristics. For identification, you need identification keys, which help you to find the name of snail family and species.

Materials

- 4 shells of 4 different freshwater snail species.
- 1 photo of 4 shells which are labeled A, B, C, D.
- 1 identification key to 4 families of freshwater snail (Key 1).
- 4 identification keys to species of 4 families (Key 2-5).
- 1 magnifying glass.
- 1 pair of gloves

Procedure

Identify 4 shells one by one. Locate the main features of the shell based on the provided figures (Fig. 1, Fig. 2, and Fig. 3) and match with the identification keys to find the name of each shell.

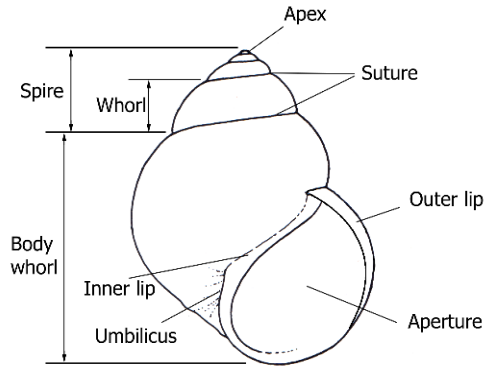

Fig. 1. Diagram of a generalised snail showing the main features

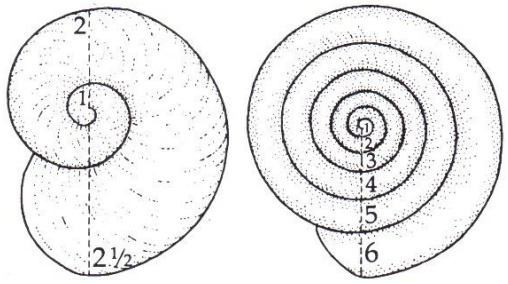

Fig. 2. Shell whorls. Left: a shell with 2,5 whorls. Right: a shell with 6 whorls.

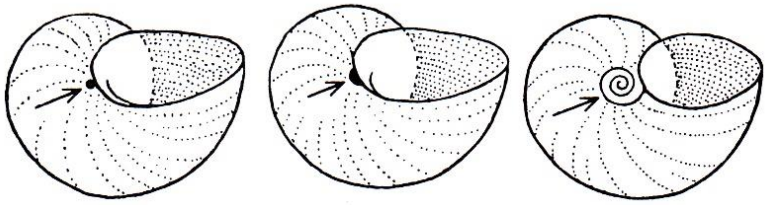

Fig. 3. Shell umbilicus types. Left to right: umbilicus from small to wide.

- *Step 1:* Take one shell out of its bag; begin by observing the whole specimen you want to identify.

- *Step 2:* Compare the shell with the photo to identify the label of specimen (A, B, C or D).

- *Step 3:* Begin working with **Key 1**. The first character gives you two alternatives in the key, decide which description best fits your shell. Then move on to the next set of two alternatives given in the key to identify the family.

Example: if your shell is sharply conical, then go to set number 2 in the Key 1. If your shell is globular to ovate-conical, then go to set number 3.

Question 1: Identify the scientific family name of each shell and write it in the answer sheet.

Label of the shell	Name of the family	
A		2 points
B		2 points
C		2 points
D		2 points

- *Step 4:* After you find out the family name of each shell, you will use **Key 2, Key 3, Key 4 or Key 5** accordingly to find out the species name of each shell.

Question 2: Identify the scientific species name of each shell and write it in the answer sheet.

Label of the shell	Name of the species	
A		2 points
B		2 points
C		2 points
D		2 points

EXPERIMENT 2: In this experiment, candidate will locate some main features on a valve of a freshwater clam.

Material

- A dry valve of freshwater clam *Sinanodonta* sp.

Procedure

Here is a short description of a freshwater clam:

A shell of clam species *Sinanodonta* sp. consists of two equal valves, connected by a **hinge joint**. There are two adductor muscles, which can contract to close the valves. These muscles leave adductor muscle scars on the dry shell. **Umbo** is the oldest part of the shell. As the clam grows, the shell will be bigger and forms **growth lines** on outer surface. Shell has three layers and one of these is **nacre**, which made them widely used by human as decoration.

Question 3. Examine the valve, read the description above and point out the features: **hinge joint, umbo, growth lines, nacre layer** on **Fig. 4.** Label the shell in the answer sheet.

*Example: The feature **adductor muscle scar** was pointed out on Fig. 4*

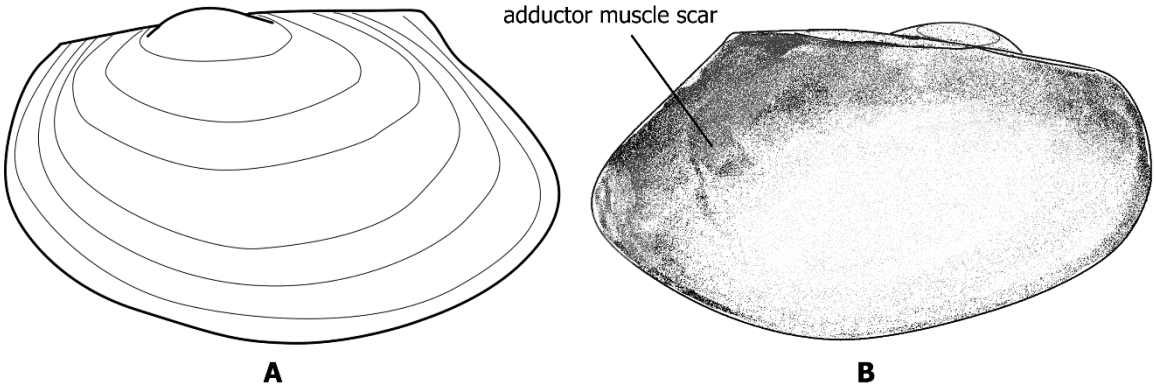

Fig. 4. Diagram of a generalised bivalve shell exterior (A) and interior (B) showing main features.