Question set 1

A) Species is part of genus

B) Specimen has a species

C) (in separate file)

D) 1) All properties and methods from Genus, species, and specimen can be accessed from a single specimen object, since all of the methods and properties are inherited, which allows programmers to not repeat code

2) The same method name can be assigned different tasks in each class because of polymorphism, which means that all the code will not produce errors

E)i) Because the tostring method on genus gets replaced by the tostring method of species

ii) Polymorphism

Question set 2

A) Encapsulation means wrapping data and code into one unit, and additionally, the data cannot be accessed externally except through methods inside the capsule.

B) 1) Encapsulation can allow code editing without breaking other modules, which can be very useful as a way of breaking down code and building system by system

2) Prevents other code from accessing private data/methods, which can prevent changing important code or change important data, thus preventing errors

C) getName

D) name

E) (in separate file)

F) advantage) Specimen does not need code that is from the species class, and it is inherited

Disadvantage) The process is much slower because of the extra work the computer has to do

Question set 3

A) First, add a private bool called waterAnimal inside species, as water animals don’t create markings. The waterAnimal bool will be set in the constructor. Next, add a private string called markingDescription and make a getter and setter, but only get/set if the animal is not a water animal (if statement with waterAnimal==False). Additional features can be to create an entirely separate marking class and create an instance object in the species class. This will allow more control over markings properties, and reuse the property for similar species.

B) (in separate file)

C) (in separate file)

Question set 4

A) ADT is very similar to a conceptual class, in a sense that it is not the official name when implemented. ADT is a type of object which has its behavior determined by the data values and operations in them.

B) (in separate file)

C) (in separate file)

D) (in separate file)