Polymorphism & Composition Homework - Quiz

Polymorphism

1. What does the ***word*** 'polymorphism' mean?
   Polymorphism is the ability of an object to take on many forms.

2. What does it mean when we apply polymorphism to OO design? Give a simple Java example.
   A parent type class reference can be used to refer to a child-type class

3. What can we use to implement polymorphism in Java?
   We can use interfaces or a superclass.

4. How many 'forms' can an object take when using polymorphism?
   You can use multiple interfaces as you like, so potentially infinite. It can only inherit from one superclass though.

5. Give an example of when you could use polymorphism.
   If we had a network which several devices could connect to, we could have a ‘connect’ behaviour in an interface called IConnect. So a printer can be of class Printer but is also an IConnect. A desktop is both a Desktop and an IConnect. The printer and desktop objects can also be grouped together by the shared interface.

Composition

6. What do we mean by 'composition' in reference to object-oriented programming?
   This is when an object is made up, or composed of, other objects.

7. When would you use composition? Provide a simple example in Java.
   In todays lab I had a VehicleType which was composed of VehicleComponents such as an Engine or Tyres.

8. What is/are the advantage(s) of using composition?
   Composition allows a class to use the behaviours of a group of other classes rather than just the one class if we were using inheritance. We can have a common set of behaviours many objects can use rather than worrying about the hierarchy that comes with inheritance.

9. When an object is destroyed, what happens to all the objects it is composed of?
   They would also be destroyed as the object had ownership of those behaviours.