

## OOP Sample Question 1 (RKH)

**Note: Question updated for clarity on 27/04/11**

- (a) Explain each of the following terms in Object-Oriented programming, giving short Java code examples where appropriate.
- (i) information hiding; [2 marks]
  - (ii) inheritance; [2 marks]
  - (iii) dynamic or ad-hoc polymorphism. [2 marks]
  - (iii) static polymorphism or Generics. [2 marks]
- (b) Consider the following Java function, intended to strip out all negative values in a list:

```
public void StripNegatives(List intlist) {  
  
    for (int i=0; i<intlist.size(); i++) {  
        Object o = intlist.get(i);  
        Integer i = (Integer)o;  
        if (o.intValue() $<$ 0) intlist.remove(i);  
    }  
}
```

- (i) Why is it necessary to use `Integers` rather than `ints` in the `List`? [1 mark]
- (ii) Fix the compilation problems with this code. [2 marks]
- (iii) Once compiled, explain why this code will not function as intended, illustrating your answer with an example that fails. You may assume that the supplied list contains only `Integer` objects and that the `for` loop re-evaluates its termination condition with each loop. [4 marks]
- (iv) Show how an `Iterator` could be used to address the problem you have identified. [3 marks]
- (iv) Show how to use Java Generics to enforce that the supplied list contains only `Integer` objects and to increase the readability of the code. [2 marks]