

Not all these samples carry equal marks! Nor do they necessarily reflect the expected depth, for which Tutorial questions are a better guide.

### **SAMPLE QUESTION 1**

Circle *all* the alternatives (a), (b), (c), etc., which are *true*.

- (a) A variable that is declared as `static` cannot have its initial value changed.
- (b) It is possible for different classes to implement a given interface.
- (c) An abstract class cannot be extended by another abstract class.
- (d) Suppose class *A* extends class *B*. Then it is possible that some methods in class *A* may not have been defined for class *B*.

### **SAMPLE QUESTION 2**

- (a) What is meant by the *the worst case performance* of an algorithm?
- (b) What is meant by a *lower bound* on the performance of algorithms for a certain class of problems? You may explain this with reference to the number of comparisons used to sort *N* distinct numbers.
- (c) Under what circumstances can one assert that a particular algorithm is *optimal* for a class of problems?
- (d) Display a succession of diagrams to show how the input sequence of numbers can be inserted in a initially empty AVL tree, re-balancing when needed: *Actual numbers will be given here..*
- (e) Then show the effects of deleting these numbers from the final tree you have constructed: *Actual numbers will be given here.*

### **SAMPLE QUESTION 3**

Suppose the nodes in a doubly linked list are objects of the class `Node`, and for any node `p` the methods `prev` and `next` yield the respective references to its previous and next nodes. Write the code fragment for creating a new node with reference `x` and inserting it between `p` and `p`'s next node. Do it as briefly as possible.