Part A:

A)Describe defensive copying in terms of a reference parameter to a constructor of a class. [2 marks]

To make sure the class is immutable because sometime even set no set method in class,but the field can be modified by other way like Date,you can set the system Date to change,So we should use defensive copying,coding like return data.getTime() to make it immutable.

1. What is an immutable class? Give three advantages of immutable classes 之前有了
2. i) Is it possible to extend (i.e. write a subclass of ) the Tutor class? Why?

no,it can’t be extended because Tutor has been declared as final.

ii)Explain why instances of both Student and Tutor are mutable. [3 marks]

一样

A2:

a) Briefly explain the relationships between interface, abstract and implementation classes in the hierarchy. [4 marks]

P31

1. i)Extend TreeSet to provide an InstrumentedTreeSet that records the number of attempts to remove elements from the set. Your InstrumentedTreeSet must provide the following method that is not provided by TreeSet: 10marks

跟p56第一个基本一样

ii) Why does the use of inheritance to instrument the TreeSet become a problem when we consider instrumenting other Set implementations in the same way? Explain how composition can address this problem. Give another advantage of the use of composition (as opposed to implementation inheritance). [5 marks] p55-56

We don’t know the detail of treeset, we just call it use super’s method,maybe during this process it will call something else you won’t expect(p56有注解);use implements set<E> instead of extends of TreeSet<E>; ad:composition is not tied the single-inheritance type hierarchy and is more powerful than sub-class.

Iii) Provide a partial implementation of an InstrumentedSet that uses interface inheritance and composition to instrument any implementation of Set. Your partial implementation must show:

 the InstrumentedSet class declaration, member field declarations,

 the implementation of the remove method, and the implementation of some other method of the Set interface that does not require any instrumentation, e.g. add. [6 marks]

P56最后一个

A3:

1. i) With the aid of a diagram, describe the structure of a hash table that is used to implement a set. Explain how the structure enforces the no duplicate elements invariant of sets. P54

图:+ uses an object’s integer hash code to index into an array and then allocate object to bucket.

keys are unique cannot be duplicated. That is the reason if you pass any duplicate value it return false and does not added to the ****SET**** ...

ii) Under normal conditions, a hash table provides fast access to its elements (e.g. add and remove are O(1) operations). Explain why this is and under what conditions (and how) performance of a hash table degrades. [3 marks]

In normal case,to access elements,it just spend most time on calculate the hash code of object,then quickly find its address in bucket.If the hashcode() and equals in object are correctly.they can work fast.

iii) Explain why the inconsistent implementation of Object equals and hashCode methods can undermine the integrity of Java hash table data structures. [2 marks] p54

They will lead to duplicate elements in the hash table,so break its principle of no duplicate.

1. Provide an implementation of the compareTo method forthe following Name class that orders instances of Name bylastName then firstName.

详见代码

1. Two possible implementations of the List data structure are a linked list and a resizable array. For each of the following scenarios, state which of these two implementations would be the most efficient to use and why.
2. A queue of people at a cinema ticket office. ii) The names in a mobile phone address book.

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1. A Set would be a more suitable data structure than a Lis tfor the names in a mobile phone address book, the scenario from d) ii) above. State the reason for this and also which of the Java set implementations (HashSet or TreeSet) you would use if you were to implement this and why

HashSet 有一样

Part B

B1基本一样

B2: a)一样

b) Explain how the monitor mechanism is implemented in Java. [9 marks] p150

Each object is implicitly associated with a lock that can be used to ensure mutual exclusion

In addition, each object inherits a set of methods from class Object that can be used to implement condition synchronisation.

to claim a monitor region which means data not accessible by more than one thread, Java provide synchronized statements and synchronized methods

B3) monitor 代码，没写

B3)

1. What are the distinguishing characteristics of an event driven program as opposed to a conventional program? Provide an overview of the basic architecture of an event driven program, including a description of the event processing mechanism. What is the difference between an event handler and an event dispatcher? [8 marks]

我选择只记蓝色部分 大约就是P10

1. C)基本一样