COMP 5222
Software Testing and Quality Assurance
Assignment 1
2012/2013, Term 1

Due date: ***Nov 2, 2012*** Total Mark: 60

Question 1

(a) Why is it impossible to guarantee that an arbitrary software application is error free? Give 3 reasons. (3 marks)

(b) List 5 characteristics of a test case that is "better" than another test case. (5 marks)

(c) Identify 5 key process factors that influence the effort required for doing testing. (5 marks)

Question 2

The following module of the Beer system calculates the cost of wine orders. The wine is sold in boxes of 12 bottles, and is of three types: A. Shiraz, B. Cabernet Sauvignon, and C. Lambrusco. The code is as follows:

```
Procedure CostOfWine (in: no_of_boxA, no_of_boxB, no_of_boxC;
out: cost_to_customer) is
Begin
      cost_of_boxA = 60;
      cost_of_boxB = 80;
      cost_of_boxC = 100;
      if (no_of_boxA == 2)
            discount = 5;
      elsif (no_of_boxA == 1 AND no_of_boxB == 1)
            discount = 8;
      elsif (no_of_boxC == 3)
            discount = 10;
      else
            discount = 0;
      ifend
      cost_to_customer = ((no_of_boxA * cost_of_boxA) +
(no_of_boxB * cost_of_boxB) + (no_of_boxC * cost_of_boxC)) *
(100 - discount) / 100;
      return (cost_to_customer);
end Procedure CostOfWine;
```

(a) Draw a control flow chart for procedure CostOfWine. (4 marks)

(b) Calculate the cyclomatic complexity of procedure CostOfWine. (2 marks)

(c) Create test cases that test all the basis paths and provide a set of input values and expected results (in terms of values for cost_to_customer). (5 marks)

Question 3

From an IBM study, verification prior to coding is 50% effective, and after coding is 80%. It is 10 times as costly to correct a defect after coding as before, and 100 times as costly to correct a production defect.

Compare doing verification only after coding vs. during all phases.

Assume

- there are 5 phases: Requirements, Design, Code, Test, and Production.
- 20 errors introduced at Requirements
- 20 errors introduced at Design
- 20 errors introduced at Code

(a) Work out the cost of fixing all defects when verification is done at the Test phase. (4 marks)

(b) Work out the cost of fixing all defects when verification is done at each of Requirements, Design, Code and Test phases. (8 marks)

Question 4

A bug tracking tool offers many useful functions to the users to report, track, classify bug/defect reports, etc. Take a close look at Bugzilla (http://www.bugzilla.org/features/) and list 8 key functions of this tool that help with bug tracking. (8 marks)

Question 5 (16 marks)

iMove Company is headquartered in Hong Kong and has a loyal customer base of over 2000 throughout Asia. It has its own distribution centers and maintains a fleet of delivery vehicles. Its information systems are all centrally maintained by the Information Systems (IS) staff.

The CEO of iMove wants to expand their customer base and reduce the cost of doing business. Each employee at iMove has internet access through the corporate hub. The most common use of the internet is for e-mail with sales staff (about 10) and other business partners (about 25). The company maintains a website that provides information on the company and its products.

The CEO has decided to implement a mobile solution for inventory management, which will provide its sale staff and business partners up-to-date data on its inventory any where any time. iMove has contracted out the development to your company. Write a system test plan for the system you are developing for iMove. The document's audience is mainly your internal test team and also the client manager.

The test plan should include:

- Test strategy
- Test objectives and scope
- Test phases
- Test schedule and milestones
- Entry criteria for each milestone's phase
- Tasks to be performed during each phase

- Deliverables and exit criteria for each Milestone
- Roles and responsibility
- Required testing resource

You will be graded on the following items:

1. Readability and organization of your test plan.
2. Thoroughness of test plan.

Page Limit: 12 pages.

Reference: IEEE Test Plan template:
http://www.gerrardconsulting.com/tkb/guidelines/ieee829/main.html

NOTE: Like most real-life situations, some problems are not fully defined and may require you making some decisions and listing your assumptions. There can be several possible correct approaches/answers. You are encouraged to ask for clarification if in doubt.