# THE HONG KONG POLYTECHNIC UNIVERSITY

# DEPARTMENT OF COMPUTING

# EXAMINATION

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| Course | : | MSc/PgD in Software Technology (HKCyberU) (61803) <br> PgS in Computing (61030) |
| Subject | : | COMP5222 Software Testing and Quality Assurance |
| Group | : | 281, 291 |
| Session | : | 2011 / 2012 Semester II |

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| Date | : 25 April 2012 | Time : | 19:00-21:00 |
| Time Allowed: 2 Hours | | Subject Lecturer: | Hareton Leung |

This question paper has _____4_____ pages (cover included).

## Instructions to Candidates:

1. This is a CLOSED BOOK examination.
2. Answer ALL questions.
3. Write ALL answers in the answer book provided. Begin each question on a new page.
4. Answer the question I asked, not the question you think I asked. Ask at once if any question is unclear.

**Do not turn this page until you are told to do so!**

## Question 1 (Total 56 marks)

(a) Describe the six formal stages that must be completed when carrying out a code inspection. (12 marks)

List 6 data that should be recorded at the inspection meeting? (6 marks)

(b) "Software Testing is an important part of ensuring software quality but it is not solely responsible for it." Give 4 reasons as to why you agree or disagree with this statement. (8 marks)

(c) Identify the specific documents where we can find answers for each of the following questions: (8 marks)
 i. What will be tested and why?
 ii. How will the system be tested?
 iii. When will the system be tested?
 iv. When will testing be finished?

(d) Identify two <u>disadvantages</u> of 100% path coverage. (4 marks)

(e) List 2 strengths and 2 weaknesses for data flow testing. (8 marks)

(f) When comparing test cases, we can identify those which are better than others. Give 5 different ways that one test case is "better" than another. (5 marks)

(g) Describe 5 key functions of a coverage analyzer. (5 marks)

## Question 2 (Total 25 marks)

In testing of our departmental website, it is determined that:
 - There are 5 common types of users
 - The users may use any of the following operating systems: Windows, Mac OS, Linux, iOS, Android
 - The users may access the web in the morning, afternoon, or evening
 - There are 4 types of internal staff.

(a) How many combinations are there of these variables above? (4 marks)

(b) Explain how you would create test cases that satisfy the all-pair combinations. (6 marks)

(c) Your boss assigned you to test the GUI of the new ERP system. Identify and describe 3 <u>suitable</u> test techniques that you will use, and <u>explain why</u> you select them out of the many white-box and black-box testing techniques. (15 marks)

**Question 3**                                                    **(Total 10 marks)**

Given the following control flow graph:
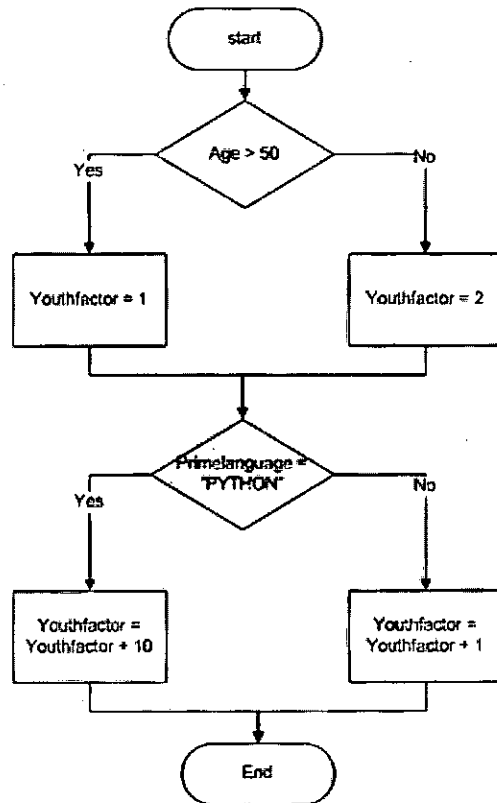


(a) Calculate the cyclomatic complexity of the control flow graph.        (3 marks)

(b) Write down input values for test cases that satisfy McCabe's basis path coverage.
                                                                          (3 marks)

(c) Write down an additional test case required to achieve full path coverage.
                                                                          (2 marks)

(d) Give the definition of "full path coverage".                          (2 marks)

**Question 4**                                                              **(Total 9 marks)**

Given the following description of a door lock:

⌘ If the door is closed, then it can be locked or unlocked.

⌘ The door can only be opened when it is unlocked.

⌘ If the door is closed (irrespective of being locked or unlocked), then it can be pushed in. Because of this event, an alarm will sound and the door will then be permanently in the state *Broken*.
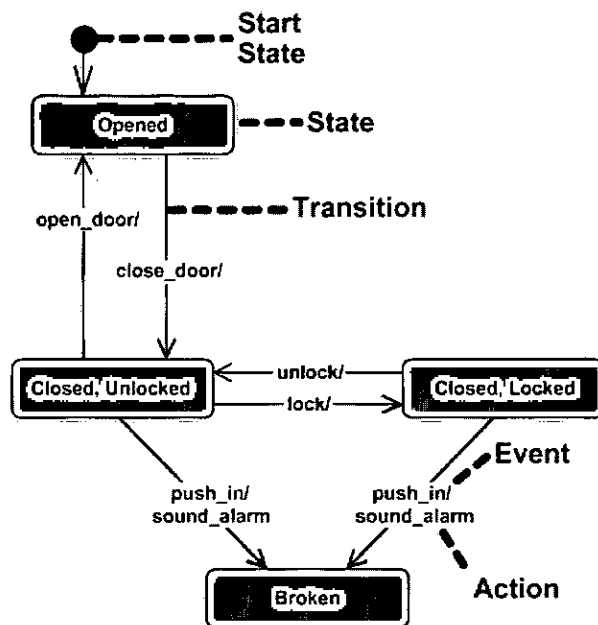


(a) Give the state transition table of the system.                  **(6 marks)**

(b) Identify 3 test cases that can exercise all the states and transitions.    **(3 marks)**

END