



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2010/2011

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

SSE 311: SOFTWARE TESTING AND QUALITY ASSURANCE

DATE: Thursday 2nd December, 2010

TIME: 11.00 a.m. – 1.00 p.m.

INSTRUCTIONS

Attempt question ONE and any other TWO.

QUESTION 1 (compulsory)

- a. Define: (3 marks)
 - i. Software reliability
 - ii. Control-Flow Testing
 - iii. Domain Testing
- b. Differentiate between blackbox and whitebox testing (4 marks)
- c. State any FOUR static analysis deficiencies in data flow testing. (4 marks)
- d. Outline FOUR approaches to integration testing? (4 marks)
- e. State the six software quality characteristics defined by ISO 9126. (6 marks)
- f. For the following algorithm, sketch a dataflow diagram (5 marks)

```
1 scanf("%d %d",&x, &y);
2 if (y < 0)
    pow = -y;
    else
    pow = y;
3 z = 1.0;
4 while (pow != 0) {
    z = z * x;
    pow = pow - 1;
5 }
6 if (y < 0)
    z = 1.0 / z;
7 printf ("%f",z);
```

- g. A triangle program reads three numbers from a user and interprets them as the sides of a triangle. The program then states whether the triangle is scalene, equilateral, or isosceles. List any EIGHT tests you would carry out on this program. (4 marks)

QUESTION 2

- a. Define Scenario testing (2 marks)
- b. List FOUR characteristics of a good scenario. (6 marks)
- c. Microsoft Paint is a basic drawing and picture editing program provided with the *Windows* operating system. Microsoft describes *Paint* as "a drawing tool you can use to create black-and-white or color drawings that you can save as bitmap (.bmp) files. You can also use Paint to send your drawing in e-mail, set the image as a desktop background, and save image files using different file formats."

When saving files in Microsoft's *Paint*, the user is allowed to type in the file extension that they would like the file to be saved as. However, the file will be corrupted if the typed-in file extension does not match the file extension selected in the 'Save As' option field.

Design a Scenario test and explain how it will be performed. (12 marks)

QUESTION 3

- a. Define:
- i. Software testing
 - ii. Software Quality assurance (4 marks)
- b. Mozilla Firefox is a web browser developed by mozilla.org. It can be used to read HTML documents online or on the local machine, check email, download files, and others. It has built in Tab browsing, pop-up blocking, image blocking and so on.

It allows the user to associate actions with file types, so the next time the browser encounters a specified file type, it will perform the associated action. The problem is that this cannot be used for all file types.

Giving reasons, suggest the type of test that is suitable to show this problem. (4 marks)

- c. OpenOffice.org is an office suite including word processing, presentations, and spreadsheets. Writer is part of the OpenOffice.org suite, and is used to create documents and letters. OpenOffice ships in most versions of Linux or can be downloaded for free from their official site.

OpenOffice.org's Writer 1.1.1 word processor has a bug that causes the program to incorrectly recognize proper ordinal numbers. For example, using the AutoCorrect/AutoFormat feature in Writer, a user may type in "1st", and Writer would change the input to be "1st" by superscripting the ordinal ending. However, Writer incorrectly recognizes "11st" as "11st".

Design a Domain test and explain how it will be performed. (12 marks)

QUESTION 4

- a. Outline FOUR reasons that contribute to software having bugs. (4 marks)
- b. Outline FOUR solutions to software development problems (4 marks)
- c. Using a diagram, describe the Software testing process (12 marks)

QUESTION 5

- a. Describe the process of data flow testing (12 marks)
- b. Identify the definitions and uses of the program below. (8 marks)

```
1.  read (x, y);
2.  z = x + 2;
3.  if (z < y)
4.      w = x + 1;
   else
5.      y = y + 1;
6.  print (x, y,
   w, z);
```