MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2012/2013

THIRD YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE (HOMA BAY CAMPUS)

CCS 311: SOFTWARE ENGINEERING

Date: 26th July, 2013 *Time: 8.00 – 10.00 a.m.*

INSTRUCTIONS:

- Answer ALL questions in SECTION A and any other TWO questions from SECTION B.
- Write your registration number on all sheets of the answer book used.
- Use a NEW PAGE FOR EVERY QUESTION attempted, and indicate the question number on the space provided on each page of the answer sheet.

Section A (Answer all questions in this section)

Question One (30 marks)

a. What are the four important attributes which all software products should have ? Suggest four other attributes of software that you think are important for software engineering. **(4 marks)**

b. Discuss how both the waterfall model and prototyping model of the software process can be accommodated in the spiral model. **(4 marks)**

c. Explain why a software system that is used in a real-world environment must change or become progressively less useful. **(4 marks)**

d. Due to a fire accident, all documentation for a product is destroyed just before it is delivered. Briefly outline the impact of the resulting lack of documentation? **(3 marks)**

e. Most engineers consider evolutionary models to be the best approach to software development in a modern context? Discuss **(5 marks)**

f. Explain why it is desirable to draw a distinction between a requirements definition and a requirements specification. **(4 marks)**

g. Suggest who might be stakeholders in a university records system. Explain why it is almost inevitable that the requirements of different stakeholders will conflict in some ways. **(6 marks)**

Question Two (20 marks)

A. EXPLAIN why the process of project planning is iterative and why a plan must be continually reviewed during a software project. **(6 marks)**

B. The LONTAR system has to include support for cataloging new documents where the system catalog may be distributed across several machines. What are likely to be the most important types of nonfunctional requirements associated with the cataloguing facilities? **(9 marks)**

C. Using your knowledge of how an ATM is used, develop a set of use-cases that could server as a basis for understanding the requirements for an ATM system **(5 marks)**

Question Three (20 Marks)

A. Draw a data-flow diagram modeling the data processing with a bank ATM involved when a customer withdraw cash from the machine. **(16 marks)**

B. Explain why it may be necessary to design the system architecture before the specifications are written. **(4 marks)**

Question Four (20 marks)

Develop a sequence diagram showing the interaction involved when a student registers for a course in a university. Course may have limited enrolment, so the registration process must include checks that places are available. Assume that the student accesses an electronic course catalogue to find out about available courses. **(20 marks)**

Question Five (20 marks)

A. What are essential conditions for software re-engineering to be successful? **(6 marks)**

B. Give at least two circumstances where you might recommend against software reuse. **(4 marks)**

C. Consider the sorting program in Figure below. List out the operators and operands and also calculate the values of software science measures like η, N, V, E, λ *etc.*

D. **(10 Marks)**

```
1   int. sort (int x[ ], int n)
2   {
3   int i, j, save, im1;
4   /*This function sorts array x in ascending order */
5   If (n<2) return 1;
6   for (i=2; i<=n; i++)
7   {
8   im1=i-1;
9   for (j=1; j<=im; j++)
10  if (x[i] < x[j])
11  {
12  Save = x[i];
13  x[i] = x[j];
14  x[j] = save;
15  }
```

```
16  }
17  return 0;
18  }
```