KENYA METHODIST UNIVERSITY

END OF 2ND TRIMESTER 2010 EXAMINATIONS

FACULTY   :   **SCIENCE AND TECHNOLOGY**
DEPARTMENT   :   **COMPUTER SCIENCE & BUSINESS INFORMATION**
UNIT CODE   :   **CISY112**
UNIT TITLE   :   **SOFTWARE ENGINEERING PRINCIPLES**
TIME   :   **2 HOURS**

Instructions
Answer all questions in SECTION A and ANY TWO question in SECTION B

SECTION A – Answer all questions

Question 1 – 30 marks

a. Define the following terms:
    i.   Heterogeneity   (3 marks)
    ii. Clean room software development.
    iii. Prototype
b. Explain why legacy systems can cause difficulties for companies that wish to
    reorganize their business processes.   (3 marks)

c. Describe, with examples, how the choice of programming language,
    programming tools and libraries can affect the reliability of the software developed
    using them.   (5 marks)

d. Suggest why it is important to make a distinction between developing the user
    requirements and developing system requirements in the requirements engineering
    process.   (4 marks)

e. Describe three types of non-functional requirements that may be placed on a system.
    Give examples of each of these types of requirements.   (6 marks)

f. One very widely used algorithmic software cost model is the COCOMO:

    i.   What do these abbreviations stand for?
    ii. State the formula for this model.
    iii. Why should several estimation techniques be used to produce a cost
         estimate for a large, complex software system.   (5 marks)

g. There are two types of product testing. Name and describe these two types.
                                                                         (4 marks)

Question 2 – 15 marks

a. A Web browser is a complicated program. It must deal with many types of data (images, sound, etc.), support various network services and handle the many constructs of HTML (the language in which Web pages are written). Your manager asks you to lead a small group of programmers in implementing a Web browser. Describe top–down refinement; is it appropriate for your task? (8 marks)

b.

    i. Suggest who might be stakeholders in University Academic Records Information systems. (4 marks)

    ii. Explain why it is almost inevitable that the requirements of different stakeholders will conflict in some way. (3 marks)

Question 3 – 15 marks

a. If you were developing a security-critical system, how would you integrate the Security requirements engineering and assurance processes into the model? (8 marks)

b. Historically, the introduction of technology has caused profound changes in the labor market and, temporarily at least, displaced people from their jobs. Discuss whether the introduction of advanced CASE technology is likely to have the same consequences for software engineers. (7 marks)

Question 4 – 15 marks

a. State the seven Lehman laws with reference to software evolution. (7 marks)

b. Some very large software projects have millions of lines of code. Suggest how useful the cost estimation models are likely to be for such systems. Why might the assumptions on which they are based be invalid for very large software systems? (8 marks)