THE UNIVERSITY OF THE WEST INDIES

Semester I ☐ Semester II ☐ Supplemental/Summer School ☒

Examinations of December ☐ /April/May ☐ /July ☒ 2010

Originating Campus: **Cave Hill** ☐ **Mona** ☒ **St. Augustine** ☐

Mode: **On Campus** ☐ **By Distance** ☒

Course Code and Title: **CS22Q - Introduction to Software Engineering**

Date: **July 20, 2010** Time: **4 P.M. – 6 P.M.**

Duration: **2 Hours.** **Paper No:**

Materials required:

Answer booklet: **Normal** ☒ **Special** ☐ **Not required** ☐

Calculator: *(where applicable)* **Programmable** ☐ **Non Programmable** ☐

Multiple Choice answer sheets: **numerical** ☐ **alphabetical** ☐ **1-20** ☐ **1-100** ☐

Auxiliary/Other material(s) – Please specify:

Candidates are permitted to bring the following items to their desks:

Instructions to Candidates: This paper has 2 pages & 4 questions.

Candidates are reminded that the examiners shall take into account the proper use of the English Language in determining the mark for each response.

Do Question 1 and Any Other Two

During the course we developed systems for three projects: Examiners' Meeting, Lab Management and E-Sub. Where appropriate, answer the questions below with reference to the project that you worked on.

Question 1 *Compulsory General Question [30 marks]*

a) What is the output of the process to determine the requirements of a software system? How should the output document be organised? State the functional requirements for the project you worked on. **[5 marks]**

b) Object-Oriented design begins with a class diagram. What purpose does the class diagram serve? Draw the class diagram from your project. **[5 marks]**

c) What does a sequence diagram show? Draw a detailed sequence diagram for one of the use cases in your project. **[5 marks]**

d) One of the first things to do during design is to decide on an architecture for the system you want to build. What is the role of architecture in the software development process? Describe in detail the architectural model you used for your project. What were the advantages and disadvantages of using this architectural model? **[10 marks]**

e) List the phases that follow design in the software development process. What happens during each of these phases? **[5 marks]**

Question 2 *Software Evolution [15 marks]*

Lehman and his colleagues observed software systems over a period of many years and came up with eight Lehman's Laws of software evolution.

a) These laws do not apply to all software systems. What are their limitations? **[2 marks]**

b) State any three of the laws. **[6 marks]**

c) Use Lehman's Laws to describe the challenges you would encounter in developing and maintaining a large software system to manage patient care in a hospital or to maintain the software you built for the class project. **[7 marks]**

Question 3 *Requirements [15 marks]*

a) Describe, with the use of examples from your project, the four categories of requirements. **[6 marks]**

b) What is the purpose of a use case diagram? Give a simple example of a use case diagram (maybe from your project). **[6 marks]**

c) How is a sequence diagram related to a use case diagram? You may use the example from (b) above. **[3 marks]**

Question 4 *Software Development Methodologies [15 marks]*

Software development methodologies range from waterfall, which is rigid, to incremental development models that allow flexibility and rework.

Describe a software development methodology that would be appropriate for the project you worked on and give a detailed account of the steps you would go through, covering all the phases of the development exercise. **[15 marks]**