MSc. Software Engineering

Cohort: MSE/09/PT

Examinations for 2009 - 2010 / Semester 1

MODULE: DESIGN PATTERNS

MODULE CODE: SDT5101

Duration: 2 Hours

Instructions to Candidates:

1. Answer **all** questions.
2. Questions may be answered in any order but your answers must show the question number clearly.
3. Always start a new question on a fresh page.
4. All questions **do not** carry equal marks.
5. Total marks 100.

This question paper contains 3 questions and 3 pages.

ANSWER ALL QUESTIONS

QUESTION 1: (20 MARKS)

(a) Suppose that you have been assigned to re-engineer the existing systems for a company. Do you think that design patterns can be applied to these existing systems? Justify your answer. **(3 Marks)**

(b) What are three reasons that cause requirements to change? **(3x1 Marks)**

(c) What are the three reasons for using design patterns? **(3x2 Marks)**

(d) What makes a Pattern a Pattern? **(5 Marks)**

(e) What does Alexander means by the following statement **(3 Marks)**
"But it is impossible to form anything which has the character of nature by adding preformed parts."

QUESTION 2: (20 MARKS)

(a) People want to know design patterns.

   i)   What should their attitude be about design patterns? **(2 Marks)**

   ii) How can people use design patterns to do a better job? **(2 Marks)**

   iii) What is the real value? **(2 Marks)**

(b) What is an anti-pattern? **(2 Marks)**

(c) What is the intent of the Singleton pattern? **(2 Marks)**

(d) The Singleton uses a special method to instantiate objects. What is special about this method? Why is the constructor kept private? **(5 Marks)**

(e) Using any language of your choice write the singleton class. **(5 Marks)**

QUESTION 3: (60 MARKS)

(a) Consider the observer, façade, chain of responsibility and the iterator patterns.

    i)   Give detailed descriptions and draw their structures.   *(5 x 4 Marks)*

    ii) Explain the interaction between each participant in the   *(5 x 4 Marks)*
       patterns using a sequence diagram.

    iii) Give examples of situations where these patterns can be   *(5 x 4 Marks)*
       used and explain.

*****END OF QUESTION PAPER*****