



UNIVERSITY
of
TECHNOLOGY,
MAURITIUS

MSc Software Engineering

Cohort: **MSE/08/PT**

Examinations for 2008 / 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 carry equal marks.
5. Total marks 75.

This question paper contains 3 questions and 3 pages.

ANSWER ALL QUESTIONS

QUESTION 1: (25 MARKS)

- (a) Describe briefly the four essential elements of a design pattern. **(4 Marks)**
- (b) What are factories responsible for and what is the essential reason to use a factory method? **(2 Marks)**
- (c) Factory Method and Abstract Factory design patterns are quite similar. How are they similar and how are they different? **(4 Marks)**
- (d) What are two general benefits and two dangers of the use of patterns? **(6 Marks)**
- (e) What is the intent of the Singleton pattern? **(2 Marks)**
- (f) The Singleton uses a special method to instantiate objects. What is special about this method? **(4 Marks)**
- (g) What does Alexander means by the following statement
“But it is impossible to form anything which has the character of nature by adding preformed parts.” **(3 Marks)**
- (h) What is an anti-pattern? **(2 Marks)**

QUESTION 2: (25 MARKS)

- (i) Describe a situation where the Iterator pattern is more appropriate. **(6 Marks)**
- (j) Draw the structure of an Iterator pattern. **(5 Marks)**
- (k) What are the different participants in the Iterator pattern? **(4x2 Marks)**
- (l) Give four implementation issues concerning the iterator. **(4 Marks)**
- (m) What are the two motivations behind an Iterator? **(2 Marks)**

QUESTION 3: (25 MARKS)

(a) Explain how the following patterns could be used in a Library System? **(4x5 Marks)**

- i) Singleton
- ii) Template
- iii) Decorator
- iv) Façade

Your answers should include the structure or sample code of the pattern, explanation of the pattern in the context of a Library System and justification.

(b) Do you believe that your entire problem can always be defined in terms of patterns? **(3 Marks)**

(c) Is beauty truly in the eye of the beholder or would people agree that some things are beautiful and some are not? **(2 Marks)**
What does Alexander means by this statement?

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