PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Midterm Examination: Semester 1   **Academic Year:** 2012-2013

Date: July 29, 2012 (2555)   **Time:** 13:30 – 16:30

Subject Number: 241-438   **Room:** Robot

Subject Title: SP (Software Development
and Maintenance)

Name: _____   Student Number: _____

Exam Duration: 3 hours

This paper has 6 pages (including this page).
- Write the answers in the spaces provided in the examination paper.
- Clearly write your student number in the space provided at the top of each page. Write your name and student number in the spaces provided on this cover page.
- There are 45 marks total for this exam.
  This will contribute 15% of the course total.

Authorised Materials:
- Anything the student can carry (except communication devices.)

Instructions to Students:
- Attempt all 5 questions .
- Anything illegible is incorrect.
- Answer briefly where possible, essays are **not** required. There is no need to use all of the space provided for each answer!
- The marks allocated for each question are shown next to that question.
- *Answer questions in English.* Good English is **not** required.

For marker's use only.

1	2	3	4	5	Total

Question 1.   *(10 marks)*

Explain how having a known simple test that causes a failure in software (that is operating incorrectly) is useful for discovering and correcting the problem.

Include in your answer as many uses of the test case that you can think of, and any characteristics of the test case that improve its usefulness.

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Question 2.   *(10 marks)*

For each of the questions that follow below, select the one of the following statements that provides the best (correct) answer for the question. Write the letter next to the statement in the box next to the question it answers.

There are more statements than questions, not all will be used. It is acceptable to use the same statement to answer more than one question.

The Statements:
- A) Use a source code debugging program (like *gdb*).
- B) Go home and celebrate.
- C) Choose the programming language that I know best, and use that.
- D) Write documentation.
- E) Look for a small repeatable test that causes the problem.
- F) Libraries often contain useful information.
- G) Find (or buy) an existing program.
- H) Understand the problem.
- I) Reusing code saves time and avoids bugs.
- J) Estimate the project cost.
- K) Good programmers are lazy.
- L) Make sure that the reason for the failure is fully explained.
- M) To confuse the users and make simple things more difficult.
- N) Insert print statements throughout the code to find out what happened.
- O) Run the test program once more.
- P) Often it is not clear exactly what format a particular line, or paragraph, in the source will look like.

The Questions:

i)   Programs are often linked against many existing libraries. Why?

ii) What should be the first major decision or activity when designing a program to solve a complex problem?

iii) When beginning to look for a bug in a program, the first step should be to ?

iv) When the source has been changed, and the test program no longer fails, what remains to be done?

v)   Why do good editors use regular expressions in search patterns?

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Question 3.

(10 marks)

Discuss some tools that you are aware of that are useful for analysing source code.

Give an example of the kind of function for which each tool you mention can be used.

Explain for each tool, what need of the developer, or maintainer, is met by that tool (*why the tool exists*).

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Question 4.   *(10 marks)*

Explain the process of dividing a problem into components for the purpose of modular program construction.

Include in your answer a discussion of the benefits of reusing existing code.

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Question 5.

(5 marks)

Before doing a final implementation of a required program, it is often useful to implement a prototype solution.

Why?

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