

PRINCE OF SONGKLA UNIVERSITY  
FACULTY OF ENGINEERING

**Final Examination:** Semester 1  
**Date:** October 11, 2012 (2555)  
**Subject Number:** 241-438  
**Subject Title:** SP (Software Development  
and Maintenance)

**Academic Year:** 2012-2013  
**Time:** 13:30 – 16:30  
**Room:** S817

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Name: \_\_\_\_\_ Student Number: \_\_\_\_\_

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**Exam Duration:** 3 hours

**This paper has 8 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 50 marks total for this exam. This will contribute 25% 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.

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*For marker's use only.*

1	2	3	4	5	Total

**Question 1.***(5 marks)*

- i) Which is the best programming language?
- A) Python
  - B) C
  - C) Java
  - D) C++
  - E) Perl
  - F) All the above are the same
  - G) Insufficient Information
- ii) The most important factor to consider when choosing a programming language is:
- A) Which runs fastest
  - B) Which does the programmer understand best
  - C) Which is supported on the system
  - D) Which is best for the application
  - E) Which is cheapest to purchase
- iii) The best tools to use are:
- A) The ones that provide some useful function
  - B) The ones installed on the system
  - C) The ones built by the programmer himself
  - D) Anything making output so obscure that management is confused
  - E) Those that the project required
- iv) When first reading the code for an unfamiliar application, the first step should be to:
- A) Identify the author so questions can be sent
  - B) Criticise the programming style
  - C) Understand the overall structure
  - D) Read the block comments
  - E) Find at least one bug as soon as possible
- v) When debugging, you must **always**:
- A) Add output (*printf*) statements everywhere
  - B) Be able to verify that a bug was fixed
  - C) Use the best source level debugger available
  - D) Introduce another bug so you have work next week
  - E) Fix all the bugs in the program

**Question 2.***(5 marks)*

Sort the following events (which are a subset of everything that would happen) into the order in which you would expect them to occur in a normal software development situation, and write the letters next to each event in order, first to last, in the boxes below:

- A) Divide the task into smaller sub-tasks
- B) Request additional time to find the last bug
- C) Consult users about requirements
- D) Compile the code
- E) Link external function libraries
- F) Investigate and understand the problem
- G) Document the internal interfaces
- H) Choose programming language
- I) Find a test case to reliably cause a bug
- J) Write user tutorial documentation

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**Question 3.***(30 marks)*

The questions on the following pages refer to the situation described below:

A Programmer receives a problem report for some software for which he is responsible. He reads the report and decides he knows where in the source code the problem must be occurring, so he goes to the appropriate source file and examines it.

While doing that, the programmer observes some aspects of the code that could be improved. He moves some code around to make execution of one of the loops more efficient. He also deletes a function that appears to be unused, and converts another to generate inline code.

The programmer also decides that this area of the program should have another operation available to the users, so he creates a new command, writes the code to implement it, and adds the new command to the help file.

After this, the programmer compiles the resulting modified application, corrects a few minor errors (typing mistakes, and similar) that the compiler reports, and after this has completed successfully, runs the program to test whether the original problem from the report still exists.

The program appears to successfully complete the test, so the programmer reports the bug as fixed, and goes on to his next task.





**Question 4.***(5 marks)*

Which of the following statements are true?  
*(Write T or F in each box provided)*

- A) Documentation is always required before a project is finished
- B) Building extra tools wastes resources
- C) There are no large programs that are known to have no bugs
- D) Optimisation is always required before a project is finished
- E) There are no programs without bugs

**Question 5.**

*(5 marks)*

- A) For which kinds of programs do you believe most likely that you would use a parser generator to translate a grammar you write?

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- B) You are most likely to need to understand regular expressions for what kinds of tasks?

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- C) Using specialised programming systems (or languages) (such as logic programming, string processing, ...) is appropriate for .... ?

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- D) A half working existing solution to a current problem is useful because ? *(or if you prefer: "is not useful, because...")*

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- E) Which do you think is worse: a program that crashes frequently when used, or a program that completes but generates incorrect answers?

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