

**Practitioner Certificate
In
Software Testing**

Practice Exam 1

Time allowed: 3 hours

1 Compulsory Question

5 optional questions, from which 3 questions must be attempted

(for the purposes of a practice exam, there are only three optional questions, i.e. you need to attempt every question within this paper)

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Examination Question 1

(40 marks possible)

Answer each of the questions based on the following code example:

```
Read a
Read b
Read c
IF a+b > 200 THEN
    Print "Combined values are large"
ENDIF
IF a > 175 THEN
    Print "Input 'a' is large"
ENDIF
IF c > a THEN
    Print "Input 'c' is even larger than input 'a'"
ENDIF
```

- 1) What is the minimum amount of tests required to achieve 100% full statement coverage? *(2 marks)*
- 2) What is the minimum amount of tests required to achieve 100% full branch coverage? *(2 marks)*
- 3) Illustrate a 'Control-flow Graph' for the code example. *(8 marks)*
- 4) What is the value of Cyclomatic-complexity? Include in your answer how you calculated your answer. *(8 marks)*
- 5) Using the 'Lines of Code' complexity metric, Provide the 'Lines of Code' count. Also, describe how this metric could be enhanced to provide a more meaningful result. *(5 marks)*
- 6) A Manager has asked you about 'Data-flow Analysis'. Describe what Data-flow analysis actually is? and what it can provide. Include with you answer some code examples to illustrate your answer. *(15 marks)*

Examination Question 2

(20 marks possible)

A major aircraft manufacturer has decided to develop a new auto-pilot system. As the Test Manager on this project you have been asked to provide details on risk based testing for the auto-pilot project.

- 1) Give an overview of what is meant by 'risk' in relation to testing. Include with this answer the type of risks that can be associated with the given scenario. *(10 marks)*

- 2) Provide detailed descriptions of the three components of Risk Management. *(5 marks)*

- 3) Describe in detail what is meant by 'risk mitigation'. *(5 marks)*

Examination Question 3

(20 marks possible)

You have been approached by your Manager to give your thoughts on improving the company's processes. He also mentioned that the company would like to go down the route of implementing a maturity model, but was at this stage undecided.

Your Manager explained to you that he had no idea about the maturity models available and so was seeking to get you to assist him to bring him up to speed as to what was available.

- 1) Provide an overview of what exactly a maturity model is? *(4 marks)*

- 2) Provide a brief description of the CMM and CMMI, and also the ISO/IEC 15504. *(8 marks)*

- 3) Provide a comparison of the TMM and the TPI. *(8 marks)*

Examination Question 4

(20 marks possible)

The testing department in a software company has been using the same tool for test automation for several years. As the software under test has been increasing in complexity recently, it has highlighted several shortcomings of the current automated testing package. You have been chosen to come with a plan of how to go about choosing a new package and also how to implement it with the least amount of problems.

- 1) Provide a description of how the new test tool should be selected, including a suggested evaluation process. *(7 marks)*

- 2) Describe a way of actually implementing the new test tool with a view to provide the least amount of risk. *(7 marks)*

- 3) With excitement over the prospect of a new test tool being implemented, the Test Team Leader has asked you to if automated tools exist that can achieve the following:
 - Generating test cases from specifications
 - Providing run-time information on the state of the executing software
 - Highlighting differences between actual results and expected results
 - Automatic generation of expected results

Briefly describe the test tools that can achieve the above requirements.

(6 marks)