

Name: _____ Student ID: _____

Section A

1. Function *Grading* in figure below computes a student grade given the percentage score.
 - a. Draw the DD-path graph for the Grading function. Annotate the graph showing the basic node types that occur in it. List all the independent paths in the DD-path graph. **[16%]**
 - b. How many test cases would be needed for 100% Statement Coverage (C_0 metric) **[04%]**
 - c. Specify the test cases which ensure the 100% Path Coverage (C_1) of the *Grading* function. Use a simple form of test case specification, i.e., a table with the following headings:

Test Case ID	Input Values	Expected Values
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As a part of your answer: (i) Explain what is meant by the Path Coverage; (ii) Explain in detail what principles you have used to generate your test cases. **[14%]**

- d. Do the tests generated using the Path Testing method make you confident that you will detect most of important bugs? Why? **[06%]**

```
1 function Grading
2     int Score
3     string Grade
4     input( Score )
5     if Score > 79
6     then Result = "Distinction"
7     else
8         if Score > 59
9         then Result = "Merit"
10        else
11            if Score > 39
12            then Result = "Pass"
13            else
14                Result = "Fail"
15            endif
16        endif
17    endif
18    return( Result )
19 end Grading
```

Section B

2. What is the purpose of exit criteria in testing? [05%]
- To identify how many tests to design.
 - To identify when to start testing.
 - To identify when to stop testing.
 - To identify who will carry out the test execution.
3. Which of the following principles should be followed when introducing a test tool into an organisation? [08%]
- Assessing organisational maturity to establish whether a tool will provide expected benefits.
 - Requiring a quick payback on the initial investment.
 - Including a requirement for the tool to be easy to use without having to train unskilled testers.
 - Identifying and agreeing requirements before evaluating test tools.
- i and ii.
 - i and iv.
 - ii and iii.
 - iii and iv.
4. Which of the following is **not** true of regression testing? [05%]
- It can be carried out at each stage of the life cycle.
 - It serves to demonstrate that the changed software works as intended.
 - It serves to demonstrate that software has not been unintentionally changed.
 - It is often automated.
5. Briefly explain the following terms in the context of software testing: [15%]
- load testing
 - stress testing
 - volume testing
6. What is the primary difference between the test plan, the test design specification, and the test procedure specification? [05%]
- The test plan describes one or more levels of testing, the test design specification identifies the associated high-level test cases, and a procedure specification describes the actions for executing a test.
 - The test plan is for managers, the test design specification is for developers and the test procedure is for testers who are automating tests.
 - The test plan is the least thorough, the test procedure specification is the most thorough and the test design specification is midway between the two.
 - The test plan is finished in the first third of the project, the test design specification is finished in the middle third of the project and the test procedure specification is finished in the last third of the project.

Section C

7. What are the strategic options for legacy system evolution? When would you normally replace all or part of a system rather than continue maintenance of the software? **[10%]**
8. Suggest appropriate reliability metrics for the classes of software system below. Give reasons for your choice of metric. **[12%]**
 - a. a system that monitors patients in a hospital intensive care unit.
 - b. a word processor.
 - c. an automated vending machine control system.
 - d. a system to control braking in a car.
 - e. a system to control a refrigeration unit.
 - f. a management report generator.