A10.2-R4: SOFTWARE TESTING & QUALITY MANAGEMENT

NOTE:

IMPORTANT INSTRUCTIONS:

1.   There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.

2.   **PART ONE** is to be answered in the **OMR ANSWER SHEET** only, supplied with the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book.

3.   Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the answer sheet for **PART ONE** is returned. However, candidates, who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the answer sheet for **PART ONE**.

TOTAL TIME: 3 HOURS   **TOTAL MARKS: 100**
(PART ONE – 40; PART TWO – 60)

PART ONE
(Answer all the questions)

1.   Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "OMR" answer sheet supplied with the question paper, following instructions therein.   (1x10)

1.1   Testing should be stopped when:
A)   All the planned tests have been run
B)   Time has run out
C)   All faults have been fixed correctly
D)   It depends on the risks for the system being tested

1.2   Which of the following statements is NOT true?
A)   Inspection is the most formal review process
B)   Inspections should be led by a trained leader
C)   Managers can perform inspections on management documents
D)   Inspection is appropriate even when there are no written documents

1.3   Unreachable code would best be found using:
A)   Code reviews
B)   Code inspections
C)   A test management tool
D)   A coverage tool

1.4   Which of the following is NOT included in the Test Plan document of the Test Documentation Standard?
A)   Test items (i.e. software versions)
B)   What is not to be tested?
C)   Quality plans
D)   Test environments

1.5   Pick the best definition of quality
A)   Quality is job one
B)   Zero defects
C)   Conformance to requirements
D)   Work as designed

1.6   How many test cases are necessary to cover all the possible sequences of statements (paths) for the following program fragment? Assume that the two conditions are independent of each other:

………

```
if (Condition 1)
then statement 1
else statement 2
fi
if (Condition 2)
then statement 3
fi
```

………

A)   3 Test Cases
B)   2 Test Cases
C)   4 Test Cases
D)   Not achievable

1.7   Integration will come under
A)   CMM Level 1
B)   CMM Level 2
C)   CMM Level 3
D)   None

1.8   Test ware (test cases, test dataset)
A)   Needs configuration management just like requirements, design and code
B)   Should be newly constructed for each new version of the software
C)   Is needed only until the software is released into production or use
D)   Does not need to be documented and commented, as it does not form part of the released software system

1.9   Fault Masking is
A)   Error condition hiding another error condition
B)   Creating a test case which does not reveal a fault
C)   Masking a fault by developer
D)   Masking a fault by a tester

1.10   Acceptance test cases are based on what?
A)   Decision table
B)   Code
C)   Design
D)   Requirements

2. **Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the "OMR" answer sheet supplied with the question paper, following instructions therein.** **(1x10)**

2.1   In software quality assurance work, there is no difference between software verification and software validation.

2.2   Drivers and stubs are not needed for unit testing because the modules are tested independently of one another.

2.3   Configuration reviews are not needed if regression testing has been rigorously applied during software integration.

2.4   Debugging is not testing, but always occurs as a consequence of testing.

2.5   The cyclomatic complexity of a program can be computed directly from a PDL representation of an algorithm without drawing a program flow graph.

2.6   Types of quality tools are problem identification tools and problem analysis tools.

2.7   Security testing attempts to verify that protection mechanisms built into a system protect it from improper penetration.

2.8   Validation plan describes the approach resource and schedule used for the system validation.

2.9   Program flow graphs are identical to program flowcharts.

2.10 Path Test Index = Number of paths tested / Total no of paths.

3. **Match words and phrases in column X with the closest related meaning/ word(s)/phrase(s) in column Y. Enter your selection in the "OMR" answer sheet supplied with the question paper, following instructions therein.** **(1x10)**

	X		Y
3.1	White-Box Testing	**A.**	Type of Integration testing
3.2	Exploratory Testing	**B.**	What type of error is missed by Black-Box Testing?
3.3	Defect	**C.**	Analysis or correctness of a program.
3.4	Audit Trail	**D.**	Acceptance Test are normally conducted by the
3.5	Win Runner	**E.**	Test or Experimentation
3.6	Brute-Force Attack	**F.**	Boundary value analysis can only be used to do
3.7	Developer	**G.**	Agent of change
3.8	CMM Level 2	**H.**	Optimizing.
3.9	Logical errors	**I.**	If a program in its functioning has not met user requirements is some way, then it is
3.10	Dynamic Verification	**J.**	The main Testing Process is learning.
		K.	Malicious user could provide unexpected input to the application
		L.	Management and Measurement
		M.	Stress Testing

4.   **Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Enter your choice in the "OMR" answer sheet supplied with the question paper, following instructions therein.** **(1x10)**

A.	Quality Assurance	B.	Flexibility	C.	Big Bang Testing
D.	Increase	E.	Acceptable Quality Level	F.	Validation
G.	Top-down integration	H.	logic errors	I.	Reusable
J.	Verification	K.	performance error	L.	Unreachable code
M.	Module integration				

4.1   "ISO 9000" concerns _____ setup in an organization.

4.2   _____ is a level name in the Capability Maturity Model.

4.3   All the modules of the system are integrated and tested as complete system in the case of _____.

4.4   AQL stands for _____.

4.5   The effort required for modifying an operational program is _____.

4.6   Are we building the product right? Is about _____.

4.7   _____ occupies unnecessary memory.

4.8   The process starting with the terminal modules is called _____.

4.9   _____ types of errors are missed by black-box testing and can be uncovered by white-box testing.

4.10 Each time a defect gets detected and fixed, the reliability of a software product _____.

PART TWO
(Answer any **FOUR** questions**)**

5.
a) Describe design walk through and critical design review.
b) Elaborate SPICE as a framework used for the assessment of software processes in software engineering.
c) Explain various types of debugging techniques used in Software testing.

(5+5+5)

6.
a) Elaborate Black-box Testing Techniques: Equivalence Class Partitioning and Boundary value analysis.
b) Give the significance of the Terms: Test Suites and Test Cases. Describe how to design Test Case and format of it.
c) Explain various types of static and dynamic testing tools.

(5+5+5)

7.
a) What is significance of Automated Testing Tools? List types of Testing Tools with example.
b) What is the purpose of Software Test Plans? Describe process of preparing software test plan. Describe contents of various Test document.
c) What is the importance of Software Quality Management Models? Give comparison of ISO and CMM models.

(5+5+5)

8.
a) What is Validation Testing? Describe Validation Test Criteria and Configuration Review related to Validation Testing.
b) Explain McCabe's Cyclomatic complexity metric.
c) What is Usability of Software product? Briefly explain how to test usability and Goal of Usability Testing.

(5+5+5)

9.
a) Which are fundamental measures in Software Testing? Describe metrics to measure the Test effort and Test performance.
b) Differentiate between verification and validation. And Explain verification activities during life cycle.
c) "Quality of software can't be completely evaluated until the software is completely developed". Justify this statement.
d) What is the meaning of FTR (Formal Technical Review)? What are the guidelines to review software product? List and explain various activities involved in Software audit.

(5+3+4+3)