BE7-R4: SOFTWARE TESTING AND 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 The testing technique that requires devising test cases to exercise the internal logic of a software module is called
A)   behavioral testing
B)   black-box testing
C)   grey-box testing
D)   white-box testing

1.2 What types of errors are missed by black-box testing and can be uncovered by white-box testing?
A)   logic errors
B)   performance errors
C)   typographical errors
D)   both A) and

1.3 A Verification that process deliverables/phases are meeting the user's true needs is called as
A)   Inspections
B)   Reviews
C)   Acceptance testing
D)   Acceptance criteria

1.4 The purpose of requirement phase is
A)   To freeze requirements
B)   To understand user needs
C)   To define the scope
D)   All of the above

1.5 The process starting with the terminal modules is called
A)   Top-down integration
B)   Bottom-up integration
C)   Module integration
D)   None of the above

1.6   The inputs for developing a test plan are taken from
A)   Project plan
B)   Business plan
C)   Support plan
D)   None of the above

1.7   Inspections can find all the following, except
A)   Variables not defined in the code
B)   Spelling and grammar faults in the documents
C)   Requirements that have been omitted from the design documents
D)   How much of the code has been covered

1.8   Quality costs may be divided into costs associated with
A)   prevention, appraisal, and failure
B)   people, process, and product
C)   customers, developers, and maintenance
D)   all of the above

1.9   The ISO quality assurance standard that applies to software engineering is
A)   ISO 9000:2004
B)   ISO 9001:2000
C)   ISO 9002:2001
D)   ISO 9003:2004

1.10   The cyclomatic complexity metric provides the designer with information regarding the number of
A)   cycles in the program
B)   errors in the program
C)   independent logic paths in the program
D)   statements in the program

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   The goal of quality assurance is to provide management with the data needed to determine which software engineers are producing the most defects.
2.2   The purpose of software reviews is to uncover errors in work products so they can be removed before moving on to the next phase of development.
2.3   Graph-based testing methods can only be used for object-oriented systems.
2.4   Standard order of activities in which software testing is organized are: system, integration, unit, validation.
2.5   A program can have more than one linearly independent path.
2.6   Debugging occurs as a consequence of unsuccessful testing.
2.7   Program flow graphs are identical to program flowcharts.
2.8   Equivalence testing divides the input domain into classes of data from which test cases can be derived to reduce the total number of test cases that must be developed.
2.9   The software tester may or may not be involved in the actual acceptance testing.
2.10   The major aim of the software testing is to deliver fault free product to the customer.

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

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.	LINUX	**B.**	Unreachable code	**C.**	Verification
D.	Quality Assurance	**E.**	Flexibility	**F.**	Integration Testing
G.	Acceptable Quality Level	**H.**	Risk Management	**I.**	CASE tools
J.	Defined	**K.**	Big-Bang Testing	**L.**	Acceptable Quantity Level
M.	MS Office				

4.1 The effort required for modifying an operational program is _____.
4.2 All the modules of the system are integrated and tested as complete system in the case of _____.
4.3 The tools that support different stages of software development life cycle are called _____.
4.4 _____ is the most important feature of spiral model.
4.5 _____ is a level name in the Capability Maturity Model.
4.6 AQL stands for _____.
4.7 "ISO 9000" concerns _____ setup in an organization.
4.8 _____ is system software.
4.9 _____ occupies unnecessary memory.
4.10 Are we building the product right? Is about _____.

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

5.
a)   Explain various types of static and dynamic testing tools.
b)   Describe design walk through and critical design review.
c)   "Quality of software can't be completely evaluated until the software is completely developed". Justify this statement. What is Quality Assurance? How is it Differ from Quality Control?

(5+5+5)

6.
a)   Differentiate between literative Enhancement Model and Evolutionary Development model.
b)   Explain various types of debugging techniques used in software testing.
c)   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+5+5)

7.   Write short notes on **any three** of the following:
a)   Key process areas (KPAs) of Capability Maturity model (CMM).
b)   McCabe's Cyclomatic complexity metric.
c)   SPICE in software engineering.
d)   Equivalence Class Partitioning and Boundary value analysis in Black Box Testing.

(5+5+5)

8.
a)   Explain the concept of bottom-up, top-down and hybrid design.
b)   What do you mean by statement coverage and branch coverage? What is significance of both and explain with example.
c)   Differentiate between verification and validation. And Explain verification activities during life cycle.

(5+4+6)

9.
a)   What is the need of Software Quality Certification in Software Quality Assurance? Briefly explain major Certification related to Software Quality Assurance. Explain Software Quality Assurance planning document.
b)   Define the following concepts:
     i)   Structural testing
     ii)   Special value testing
     iii)   Mutation testing
     iv)   Stress Testing

(7+[2x4])