A10.2-R4: SOFTWARE TESTING AND QUALITY MANAGEMNET

अवधि: 03 घंटे **अधिकतम अंक: 100**
DURATION: 03 Hours **MAXIMUM MARKS: 100**

ओएमआर शीट सं.: **OMR Sheet No.:**						

रोल नं.: **Roll No.:**							**उत्तर-पुस्तिका सं.:** **Answer Sheet No.:**						

परीक्षार्थी का नाम: **परीक्षार्थी के हस्ताक्षर:**
Name of Candidate: _____; Signature of candidate: _____

परीक्षार्थियों के लिए निर्देश:	**Instructions for Candidate:**
कृपया प्रश्न-पुस्तिका, ओएमआर शीट एवं उत्तर–पुस्तिका में दिये गए निर्देशों को ध्यान पूर्वक पढ़ें।	Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.
प्रश्न-पुस्तिका की भाषा अंग्रेजी है। परीक्षार्थी केवल अंग्रेजी भाषा में ही उत्तर कर सकता है।	Question Paper is in English language. Candidate can answer in English language only.
इस मॉड्यूल/पेपर के **दो भाग** है। **भाग एक** में चार प्रश्न और **भाग दो** में पाँच प्रश्न है।	There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions**.**
भाग एक "वैकल्पिक" प्रकार का है जिसके कुल अंक 40 है तथा **भाग दो**, "व्यक्तिपरक" प्रकार है और इसके कुल अंक 60 है।	**PART ONE** is Objective type and carries 40 Marks. **PART TWO** is subjective type and carries 60 Marks.
भाग एक के उत्तर, इस प्रश्न-पत्र के साथ दी गई **ओएमआर उत्तर-पुस्तिका** पर, उसमें दिये गए अनुदेशों के अनुसार ही दिये जाने है। **भाग दो** की उत्तर-पुस्तिका में **भाग एक** के उत्तर **नहीं** दिये जाने चाहिए।	**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 for **PART TWO**.
भाग एक के लिए अधिकतम समय सीमा **एक घण्टा** निर्धारित की गई है। **भाग दो** की उत्तर-पुस्तिका, **भाग एक** की उत्तर-पुस्तिका जमा कराने के पश्चात दी जाएगी। तथापि, निर्धारित एक घंटे से पहले **भाग एक** पूरा करने वाले परीक्षार्थी **भाग एक** की उत्तर-पुस्तिका निरीक्षक को सौंपने के तुरंत बाद, **भाग दो** की उत्तर-पुस्तिका ले सकते हैं।	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.**
परीक्षार्थी, उपस्थिति-पत्रिका पर हस्ताक्षर किए बिना अथवा अपनी उत्तर-पुस्तिका, निरीक्षक को सौंपे बिना, परीक्षा हाल नहीं छोड़ सकता हैं। ऐसा नही करने पर, परीक्षार्थी को इस मॉड्यूल/पेपर में अयोग्य घोषित कर दिया जाएगा।	**Candidate cannot leave the examination hall/room without signing on the attendance sheet or handing over his Answer sheet to the invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**
प्रश्न-पुस्तिका को खोलने के निर्देश मिलने के पश्चात एवं उत्तर देने से पहले उम्मीदवार यह जाँच कर यह सुनिश्चित कर ले कि प्रश्न-पुस्तिका प्रत्येक दृष्टि से संपूर्ण है।	After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question booklet is complete in all respect.

जब तक आपसे कहा न जाए तब तक प्रश्न-पुस्तिका न खोलें।

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

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 _____ is the process of evaluating a system or component to determine whether the products of a given phase satisfy the conditions imposed at the start of the phase.
A) Validation
B) Verification
C) Assurance
D) Walkthrough

1.2 Acceptance testing is a phase wherein testing is done by:
A) Testing team
B) Customers
C) Validation team
D) Quality team

1.3 A variable is considered to be _____ when it appears inside a computation such as in an arithmetic expression.
A) Predicate use
B) Computational use
C) Calculation use
D) Performance use

1.4 _____ represents the conditions on the inputs that must be satisfied before invocation of the unit under test.
A) Primary conditions
B) Preconditions
C) Preliminary conditions
D) Initial conditions

1.5 _____ may just mean having your test management tool track all changes that you make to a test case.
A) Version control
B) Test control
C) Process control
D) Case control

1.6 _____ is a subset of procedural programming that enforces a logical structure on the program being written to make it more efficient and easier to understand and modify.
A) Imperative programming
B) Object Oriented Programming
C) Modular programming
D) None of the above

1.7 The formula to calculate branch coverage is equal to:
A) = (Number of decisions outcomes tested / Total Number of decision Outcomes) x 100 %
B) =Number of decisions outcomes tested / Total Number of decision Outcomes x 100 %
C) =(Number of statements tested / Total Number of statements) x 100 %
D) =Number of statements tested / Total Number of statements x 100 %

1.8 The _____ series consists of five standards that defines an internationally agreed set of standards that can be used for any type of software testing.
A) ISO / IEC / IEEE 29116
B) ISO / IEC / IEEE 29117
C) ISO / IEC / IEEE 29118
D) ISO / IEC / IEEE 29119

1.9 A well-executed project will have:
A) Zero or acceptable effort variance and acceptable schedule variance
B) Zero or acceptable effort variance and zero schedule variance
C) acceptable effort variance and acceptable schedule variance
D) both A) and C)

1.10 A _____ Path is a path segment such that if the last link has a use of X, then the path is simple and definition clear.
A) ud
B) dc
C) dd
D) du

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

2.1 The test selection problem is to find a small subset of all possible inputs and, and the corresponding expected outputs, that will serve as a test suit.
2.2 Waterfall model is very useful when a project can actually be divided into watertight compartments.
2.3 Verification is the process of evaluating a system or component during or at the end of the development process to determine whether it satisfies specified requirements.
2.4 Testing in V model is done towards the end of the development cycle.
2.5 Testing the interaction between the modules and interaction with other systems externally is called system testing.

ROUGH WORK SPACE:

2.6 Encapsulation provides the right level of abstraction about the variables and methods to the outside world.

2.7 Boundary value analysis is useful to generate test cases when the input (or output) data is made up of not identifiable boundaries or ranges.

2.8 A test is considered adequate with respect to p-use criterion when it covers all feasible p-uses in the program under test.

2.9 Effort is the actual time that is spent on a particular activity or a phase.

2.10 Testing finds errors while debugging localizes and repairs them.

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	Quality assurance	**A.**	maturity levels and capability levels
3.2	Spiral	**B.**	Has no access to program code
3.3	CMMI	**C.**	Unit testing tool
3.4	Cyclomatic complexity	**D.**	can never be executed
3.5	Black box testing	**E.**	Defect detection and correction oriented
3.6	JUnit	**F.**	recording information about a program's execution
3.7	Object Oriented Programming	**G.**	Structured programming
3.8	tracing	**H.**	Defect prevention oriented
3.9	Quality control	**I.**	Dynamic binding
3.10	Unreachable code	**J.**	Product evolving as increments
		K.	Domain specialization
		L.	Number of predicate nodes +1
		M.	Polymorphism

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

A.	Unit testing	**B.**	AU	**C.**	Decision
D.	mathematical	**E.**	Top-down	**F.**	SPICE
G.	Postconditions	**H.**	path	**I.**	Elapsed days
J.	Black box	**K.**	Checkpoints	**L.**	ADUP
M.	Actual days				

4.1 Program correctness is established via _____ proofs.

4.2 _____ is the international standard for software development process assessment.

4.3 _____ testing is done without the knowledge of the internals of the system under test.

4.4 _____ is the difference between the start of an activity and the completion of the activity.

4.5 _____ should capture all the expected outcomes of the module under test.

4.6 _____ could occur at almost any stage in a software development process.

4.7 In _____ approach overall procedure or task is divided into component parts (modules) and then subdivide each component module until the lowest level of detail has been reached.

4.8 _____ allow you to compare the current behaviour of the application being tested to its behaviour in an earlier version.

4.9 _____ requires that at least one path from every definition of every variable to every use of that definition be exercised under some test.

4.10 Each additional condition in a program adds at least one _____.

ROUGH WORK SPACE:

PART TWO
(Answer any FOUR questions)

5.

a) The statement "structural testing compares test program behaviour against the apparent intention of the source code." Do you agree with these statements? Explain you answer.

b) What is the significance of acceptance testing? How is it performed? What kind of test cases can be included for the acceptance testing?

(5+10)

6.

a) Compare test generation using boundary value analysis and equivalence partitioning methods in terms of tests generated, the error detection ability, and sources of tests.

b) Why quality of the software is important? List and briefly explain various software quality parameters.

(8+7)

7.

a) "It is impossible to test a program completely". Do you agree with the statement? Justify your answer.

b) Explain various phases of the V model for software testing. Further discuss its advantages and disadvantages.

(5+10)

8.

a) Explain orthogonal array testing technique with an example.

b) What is test adequacy? Compare and contrast control flow based test adequacy criteria based on statement coverage and decision coverage with an example.

(7+8)

9. Explain **any three** of the following concepts:

a) Cyclomatic complexity

b) Debugging techniques

c) External source of errors

d) Test Deliverables

(3x5)

,

*****

ROUGH WORK SPACE:

ROUGH WORK SPACE: