A8-R5 : SYSTEMS ANALYSIS, DESIGN AND TESTING

DURATION : 03 Hours   **MAXIMUM MARKS : 100**

OMR Sheet No. : ☐ ☐ ☐ ☐ ☐

Roll No. : ☐ ☐ ☐ ☐ ☐ ☐   **Answer Sheet No. :** ☐ ☐ ☐ ☐ ☐ ☐

Name of Candidate : _____ **;** **Signature of Candidate :** _____

INSTRUCTIONS FOR CANDIDATES :

- Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.

- Question Paper is in English language. Candidate has to answer in English language only.

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

- **PART ONE** is Objective type and carries **40** Marks. **PART TWO** is Subjective type and carries **60** Marks.

- **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**.

- 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** to the Invigilator.

- **Candidate cannot leave the examination hall/room without signing on the attendance sheet and handing over his/her Answer Sheet to the invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**

- 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 respects.

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

PART - ONE

(Answer all the questions; each question carries ONE Mark)

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 For determining the most appropriate software model for the project, during which phase do developers establish a roadmap for the project plan ?

(A) Software

(B) System Analysis

(C) Coding

(D) Testing

1.2 Which of the following type of diagram is not an element of Unified Modeling Language ?

(A) Use case diagram

(B) Activity diagram

(C) Entity-relationship diagram

(D) Class diagram

1.3 What is the difference between black box testing and white box testing ?

(A) Black box testing is conducted by the development team, while white box testing is conducted by the testing team.

(B) Black box testing focuses on the system's internal logic, while white box testing focuses on the system's external behavior.

(C) Black box testing is conducted without knowledge of the system's internal workings, while white box testing is conducted with knowledge of the system's internal workings.

(D) Black box testing is conducted using automated tools, while white box testing is conducted manually.

1.4 Which of the following is NOT represent a good quality of a requirement ?

(A) Specific

(B) Measurable

(C) Achievable

(D) Ambiguous

1.5 The problem that threatens the success of a project but which has not yet happened is :

(A) bug

(B) error

(C) risk

(D) failure

1.6 The system implementation approach employed to operate both the old and new systems concurrently for a defined duration is referred to as :

(A) Direct

(B) Phased

(C) Pilot

(D) Parallel

1.7 Which of the following best defines positive testing ?

    (A) Testing to identify defects and errors in a system

    (B) Checking if the system behaves correctly with valid inputs

    (C) Verifying the system's response to unexpected inputs

    (D) Testing the system's performance under high load

1.8 In the context of system design, what tool is commonly used for creating process flowcharts and illustrating the flow of data within the system ?

    (A) Decision Support System (DSS) tool

    (B) Business Process Modeling (BPM) tool

    (C) Project Management tool

    (D) Network Diagram tool

1.9. An error resulted by interchanging two digits in a numeric field like while data entry is called :

    (A) substitution error

    (B) typographical errors

    (C) transcription error

    (D) transposition error

1.10 In the spiral model 'risk analysis' is performed :

    (A) in the first loop

    (B) in the first and second loop

    (C) in every loop

    (D) before using the spiral model

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 goal of quality assurance is to provide management with the data needed to determine which software engineers are producing the most defects.

2.2 If a program in its functioning has not met user requirements in some way, then it is a failure.

2.3 The software metrics chosen by an organization are driven by the business or technical goals an organization wishes to accomplish.

2.4 The tools that support different stages of the software development life cycle are called CAM Tools.

2.5 If P is risk probability, L is loss, then Risk Exposure (RE) is computed as $RE = P + L$.

2.6 In the context of requirements analysis, partitioning results in the elaboration of data, function, or behavior .

2.7 All activities lying on the critical path have slack time equal to 1.

2.8 If every requirement can be checked by a cost-effective process, then the SRS is verifiable.

2.9 Coupling and Cohesion can be represented using a Structure chart.

2.10 For a function of two variables, boundary value analysis yields $4n + 1$ test cases.

3. Match words and phrases in column X with the closest related meaning/words(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	Data Dictionary Systems	A.	White Box Testing
3.2	Types of models are created during software requirements analysis	B.	Feature Selection
3.3	Cleaning and pre-processing Data	C.	Functional and Behavioral
3.4	Deployment Diagram	D.	Design
3.5	CMM Maturity Level 3	E.	Defined level
3.6	Mutation testing	F.	DDS
3.7	Depiction of the functional requirements from a user's perspective	G.	Black Box Testing
3.8	Structured charts	H.	UML Use Case Diagram
3.9	E-R Model	I.	Components of a system and their relationships
3.10	Focuses on the variables	J.	Static View
		K.	Deterministic
		L.	System Requirement Specification
		M.	CMM Level 2

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	White box testing	B	Probabilistic	C	Black box testing	D	Pilot
E	Fault simulation	F	JAD	G	Total Quality Management	H	Design Specification Report
I	Design Document	J	Stress Testing	K	Sequence Diagram	L	Business Process Reengineering
M	State chart						

4.1 SRS is also known as a specification of _____.

4.2 _____ is a comprehensive approach to facilitating quality improvements and management within a business and its products and services.

4.3 _____ aims to transform the nature of work within a business function, with the goal of significantly enhancing performance.

4.4 In a UML _____ Diagram, the state represents a stage in the life cycle of an object or system.

4.5 Mutation testing is _____ testing technique.

4.6 To facilitate collaborative workshops with users and developers in Rapid application development is _____.

4.7 In _____ system the interaction between various subsystems cannot be defined with certainty.

4.8 The _____ document encompasses the existing system, the proposed system, system flow charts, the modular design of the system, print layout charts, and data file designs.

4.9 By employing the _____ approach, a new system undergoes testing in one part of the organization before full implementation in others.

4.10 Conducting tests that go beyond the standard operational capacity is known as _____.

PART - TWO

(Answer any FOUR Questions)

5. (a) Discuss Model-View-Controller (MVC) architecture for internet-based applications.

(b) Explain the significance of non-functional testing in the software development life cycle. Provide examples of this testing types and discuss how they contribute to ensure the overall quality of a software product. **(8+7)**

6. (a) What do you mean by feasibility study and elaborate on various types of feasibility study ? Also, discuss the methods employed to gauge economic feasibility.

(b) What do you mean by object-oriented development ? How does it differ from structured development ? **(7+8)**

7. (a) Illustrate the conversion of ER schemas into a set of relations for a University database with entities Students and Courses. Include the use of multivalued and composite attributes, where the cardinality is required.

(b) Outline the guidelines for creating Data Flow Diagrams (DFDs). Illustrate the application of these rules by constructing a context diagram and extending it into a top-level logical DFD for an Online Book store. (Make assumptions wherever needed) **(7+8)**

8. (a) Describe the factors which have impact on maintenance costs.

(b) What does the term "deliverable" signify ? Elaborate on the key deliverables associated with the planning and analysis phase.

(c) Explain the differences between structural and behavioural diagrams as used in the Unified Modelling Language (UML). **(6+3+6)**

9. Write short note on the following **(any three)** :

(a) Agile development

(b) White Box testing

(c) Role of system analyst

(d) Black Box testing **(5+5+5)**

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