A5-R3: STRUCTURED SYSTEM ANALYSIS AND DESIGN

NOTE:

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 **TEAR-OFF ANSWER SHEET** only, attached to 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 "tear-off" answer sheet attached to the question paper, following instructions therein.   (1x10)

1.1   A zero level DFD describes
A)   overview of processes, inputs and outputs.
B)   the fully blown up system design.
C)   that the system design cannot be split further.
D)   interaction with database

1.2   A decision table specifies
A)   a list of decisions taken by the top management during the current planning horizon.
B)   a tree showing the causes and effects in a decision process.
C)   the consequence of all possible decisions in tabular from.
D)   none of the above

1.3   Which of the following is not a tool for application prototyping?
A)   Third Generation Language
B)   Report Generators
C)   Screen Generator
D)   Application Generators

1.4   An entity is
A)   a collection of items in an application
B)   a distinct real world item in an application
C)   an inanimate object in an application
D)   a data structure

1.5   The Feasibility report of an existing system highlight
A)   Dataflow and processing.
B)   Information needs.
C)   Problem areas.
D)   System output details.

1.6 Automated tools for design are also known as
A) CASE Tools
B) System design
C) DFD
D) RAD

1.7 The first step in a preliminary investigation is to
A) purchase supplies
B) hire consultants
C) define the problem
D) propose changes

1.8 Speeding up the development process significantly is one of the pros of
A) Computer-aided Systems Engineering
B) Prototyping
C) Object model
D) Process Model

1.9 Creation of a blueprint that will satisfy all documented requirements would most likely be done during
A) Systems Planning
B) Systems Analysis
C) Systems Design
D) Systems Implementation

1.10 A(n) _____ describes the logic that programmers use to write code models.
A) Object model
B) Process model
C) Network model
D) Prototype model

2. **Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the "tear-off" sheet attached to the question paper, following instructions therein.** **(1x10)**

2.1 A collection of components that work together to realize some objectives forms a system.
2.2 Coding is not a step in system development life cycle.
2.3 System analysis and system design are the same phase of system development life cycle.
2.4 The pictorial representation of the programs or the algorithm is known as flowchart.
2.5 Graphical representation of a systems data and how the processes transform the data is known as Data Flow Diagram.
2.6 The decision tree defines the conditions as a sequence of right to left tests.
2.7 The action stub contains a list of the processes involved in a decision table.
2.8 Information systems must provide effective and efficient interfaces to the system's users.
2.9 Decision Support systems are information system applications that capture and process data about business transactions.
2.10 Reverse engineering allow a CASE tool to read existing program code and transform that code into a representative system model that can be edited and refined by the System Analyst.

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 "tear-off" answer sheet attached to the question paper, following instructions therein.** (1 x 10)

	X		Y
3.1	DFD	**A.**	Collection of activities and elements designed to accomplish a goal.
3.2	Decision table	**B.**	A six phase problem solving procedure for examining and improving an information system.
3.3	Direct Approach	**C.**	Computer professional, who studies an organization's systems, to determine what actions to take and how to use computer technology to assist them.
3.4	Organization Chart	**D.**	The first phase of the system's life cycle.
3.5	Phased approach	**E.**	Data is collected about the present system.
3.6	Prototyping	**F.**	Chart showing management levels and formal lines of authority
3.7	RAD	**G.**	A helpful record of questions that guides the System Analyst and end user through key issues for the present system.
3.8	Systems Audit	**H.**	Shows the relationship between input and output documents.
3.9	System Design Report	**I.**	Table showing the decision rules that apply when certain conditions occur.
3.10	System Development	**J.**	Shows the data or information flow within an information system.
		K.	Report prepared for higher management that describes the alternative designs suggested in the design phase.
		L.	Phase consisting of developing software, acquiring hardware and testing the new system.
		M.	Approach for systems implementation whereby the old system is abandoned for the new.
		N.	Systems implementation in which the new system is implemented gradually over a period of time.
		O.	Compares the performance of a new system to the original design specification to determine if new procedures improve productivity.
		P.	Building a modifiable model before the actual system is installed
		Q.	Involves the use of powerful development software and specialized teams as an alternative to the systems development life cycle approach.

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 "tear-off" answer sheet attached to the question paper, following instructions therein. **(1x10)**

A.	Overview	**B.**	system maintenance	**C.**	static
D.	Testing	**E.**	Detail	**F.**	process
G.	Structure	**H.**	Behavior	**I.**	encapsulation
J.	Analysis	**K.**	Waterfall	**L.**	class diagrams
M	data structure	**N.**	implementation	**O.**	structured chart
P.	check digit	**Q.**	DFD	**R.**	use case diagram

4.1   _____ detects transposition errors.

4.2   The phase of the SDLC when the system is actually built or purchased is called _____ phase.

4.3   _____ development is a structured design methodology that proceeds in a sequence from one phase to the next.

4.4   The idea of placing data and the processes (methods), that operate on the data into the same object is referred to as _____.

4.5   A(n) _____ models the interaction of the information system with its end-users and other external systems.

4.6   _____ represents the things, concepts or ideas that are contained in an application.

4.7   Understanding the *as-is* system, identifying improvements, and developing requirements for the *to-be* system are the steps of the _____ phase.

4.8   A(n) _____ use case is typically created early in the process of understanding the system requirements as a way of documenting basic information about the use case.

4.9   A class diagram is a(n) _____ model.

4.10   The process of refining the system to make sure that it continues to meet business and organizational needs is called _____.

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

5.

a) Fact and data gathering is one of the important phases of system planning. Explain various fact gathering techniques. Describe pros and cons of each technique.

b) What is the Software Development Life Cycle (SDLC)? Describe various phases of SDLC. Briefly explain various types of documentation involved in each phase of SDLC.

(7+8)

6.

a) State diagram is one of the diagrams of UML. With the help of a suitable example of state diagram, explain the terms: state, transition and event.

b) What is the usage of structure chart in modular design? How is it related with cohesion and coupling? Describe various notations of structure chart.

c) What is the Management Information System (MIS)? What is impact of MIS on an organization?

(5+5+5)

7.

a) Prepare an E-R diagram for a real estate firm that lists property for sale. The following describes this organization:

- The firm has a number of sales offices in several states. Attributes of sales office include Office_Number (identifier/key) and Location.
- Each sales office is assigned one or more employees. Attributes of employee include Employee_ID (identifier/key) and Employee_Name. An employee must be assigned to only one sales office.
- For each sales office, there is always one employee assigned to manage that office. An employee may manage only the sales office to which he/she is assigned.
- The firm lists property for sale. Attributes of property include Property_ID (identifier) and Location. Components of Location include Address, City, State, and Zip_Code.
- Each unit of property must be listed with one (and only one) of the sales offices. A sales office may have any number of properties listed, or may have no properties listed.
- Each unit of property has one or more owners. Attributes of owners are Owner_ID (identifier) and Owner_Name. An owner may own one or more units of property. An attribute of the association between property and owner is Percent_Owned.

b) What is the purpose of Data Flow Diagram (DFD)? Describe steps for developing DFD. Draw the DFD for the enrolment process which works as follows:

Students send an application form containing their personal details, and their desired course. The university checks that the course is available and that the student has necessary academic qualifications. If the course is available, the student is enrolled in the course, and the university confirms the enrolment by sending a confirmation letter to the student. If the course is unavailable the student is sent a rejection letter.

(7+8)

8.

a) What is a CASE tool? Explain advantages of CASE tool with its features. Briefly explain types of CASE tools.

b) What is the Conversion of system? Why is it required? How conversion takes place in an organization for the system implementation?

c) What is the significance of Graphical User Interface (GUI) in input and output design of a system? Describe characteristics of good user interface design.

(5+5+5)

9.

a) Consider the following description of the life cycle of a customer order for PC parts and accessories from an Internet-based company.

1.   The customer creates an order on the Web.
2.   The customer submits the order once he or she has finished the choice.
3.   The credit authorization needs to be approved for the order to be accepted.
4.   If denied, the order is returned to the customer for changes/amendment or cancellation.
5.   If accepted, the order is placed.
6.   The order is shipped to the customer.
7.   The customer receives the order.
8.   The order is closed.

Construct a behavioral state machine (state chart) diagram for the order object described in the above scenario.

b) Under what circumstances is business process re-engineering required prior to system design?

c) What is Object Oriented Modeling? Define the terms: Static Model and Dynamic Model in OO Modeling. Explain the most important feature of Dynamic model that is not a feature of Static model.

(6+3+6)