B1.5-R4: STRUCTURED SYSTEM ANALYSIS & 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 SDLC is
A) Software Development Life Cycle
B) System Development Life Cycle
C) System Design, Link and Code
D) None of the above

1.2 Software design involves
A) writing algorithms
B) creating flowcharts
C) creating ERD
D) all of the above

1.3 Which of the following is/are true about requirements and specifications?
A) Requirements come from the customer whereas specifications are written by the analyst in consultation with the customer
B) The customer and user should be the only sources for requirements and specifications
C) SRS should be written in such a manner that any change in requirements does not alter any specifications
D) None of the above

1.4 Software maintenance takes inputs from
A) SRS
B) Customer feedback reports
C) SDD
D) All of the above

1.5 Data modelling of software does not involve
A) normalization
B) entity and attribute specification
C) optimization for data access
D) Optimization for data computation

1.6 Unit implementation of software does not involve
A) source coding and compiling
B) linking and creation of machine code files
C) writing program codes for interfaces and compilation
D) all of the above

1.7 White-box testing can be started
A) after SRS creation
B) after designing
C) after programming
D) after installation

1.8 Prototyping means
A) creating, developing and refining a working model of the operational system
B) testing the computer system
C) designing the computer system
D) none of the above

1.9 Which of the following statements models can release the software in multiple versions?
A) Waterfall model
B) Prototyping model
C) Waterfall model with feedback
D) Spiral model

1.10 COCOMO stands for
A) Cost Constructive Model
B) Construction Cost Model
C) Common Cost Model
D) None of the above

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 Each data flow in the DFD has a corresponding entry in the Data Dictionary.

2.2 A cost-benefit analysis calculates the Break Even Point.

2.3 Coupling between modules should be maximum for better maintainability of the software.

2.4 The logical schema, of a system that uses a database, is identical to the Entity Relationship Diagram of the System.

2.5 Attributes are assigned value when instances of objects are defined.

2.6 Data integrity is ensured by preventing unauthorized access.

2.7 Rows of a relation are called entities.

2.8 Management policy changes are difficult to implement in a file based system because redundant data are stored.

2.9 A physical DFD specifies who generates data and who processes it.

2.10 A Database Administrator is the one who designs the database for an application.

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. (1x10)

X		Y	
3.1	Alpha Test	**A.**	Begins when the software is feature complete
3.2	ERD	**B.**	Fact finding
3.3	Data Flow	**C.**	Performance Indicator
3.4	System log	**D.**	Data Model
3.5	Algorithm	**E.**	Structured Design
3.6	Pull down Menu	**F.**	A file of all updates
3.7	Modularity	**G.**	Data Management
3.8	Range Check	**H.**	Selection of an option by an user
3.9	Beta Test	**I.**	Generic solution to problems
3.10	Turnaround time	**J.**	Reasonable limit to input
		K.	Arrow
		L.	Access Control
		M.	Programming

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.	Dictionary	**B.**	Pseudo Code	**C.**	Dialogue
D.	Interface	**E.**	Planning	**F.**	Delete and Update
G.	Prototyping	**H.**	Throughput	**I.**	Computer Programming
J.	Audit	**K.**	Technical	**L.**	Operational
M.	Structure				

4.1 Data _____ describes every data element comprehensively.

4.2 Gantt Chart is a _____ tool for managing projects.

4.3 Menu driven mode is a _____ strategy to interface with the system in an interactive mode.

4.4 The modular concept is applicable to systems design as well as _____.

4.5 Reason for normalization is to _____ data.

4.6 Computer based _____ can be done through or around the computer.

4.7 Whether a proposed system can provide right information for the organisation's personnel falls under the study of _____ feasibility.

4.8 Structured English is often called _____ because it mimics programming code.

4.9 A _____ is made after completion of a pre-planned series of steps.

4.10 _____ is the hardware/software boundary that permits communication between people and computers.

PART TWO

(Answer any **FOUR** questions)

5. Write brief notes on any **three** of the following:

a) Waterfall Model
b) Audit Trail
c) Data Dictionaries
d) PERT

(5+5+5)

6.

a) Describe the three types of feasibility studies under preliminary investigation.
b) What is the difference between MIS and DSS?
c) What is normalization of a relation?

(6+4+5)

7.

a) What is the basic difference between Systems Approach and Systems Analysis?
b) What are the differences between verification and validation processes?
c) What do you understand by the term data integrity? How can data integrity be maintained in a database?

(5+5+5)

8.

a) Why is object-oriented modelling used in practice?
b) What do you understand by information hiding? Why is it resorted to in designing information system? How is it achieved?
c) What are the objectives of system tests?

(5+5+5)

9.

a) An institute has the following rules for a student to qualify for a degree with Computer Science as the main subject and Mathematics as the subsidiary subject:
   i) He should get 50% or more marks in Computer Science and 40% or more marks in Mathematics.
   ii) If he gets less than 50% marks in Computer Science, he should get 50% or more marks in Mathematics. He should, however, get at least 40% marks in Computer Science.
   iii) If he gets less than 40% marks in Mathematics and 60% or more marks in Computer Science, he is allowed to reappear in Mathematics only so that he can qualify.

   Obtain an LEDT (Limited Entry Decision Table) for the rules.

b) An university has a number of institutes attached to it. Each institute has at least one library. Students, faculty members, administration staff, and directors of the institutes can access their libraries with respective authorities and permissions. Guests can access the guest section of the library, which contains some open magazines and information catalogues of books and journals available in the library. The students, staff members as well as the directors of any institute can access the libraries of other colleges as guests only. Directors and faculty members are usually granted similar facilities in the system.

The University is interested in creating a centralized online system having all the information about the libraries of different institutes so that people can access this information with their assigned permissions unaltered from as defined in the traditional system.

Draw an ERD for the above system.

(6+9)