पार्थ

# SYSTEM DESIGN CONCEPTS

- Anju Bhatt
- Dharmveer Yadav
- Arpita Banerajee
- Vaishali Singh
- Chitresh Banerjee

# B.C.A. III YEAR

# SYSTEM DESIGN CONCEPTS

### By

**Anju Bhatt**
B.Tech. M.Tech, Ass. Proff.
Biyani Girls College

**Dharmveer Yadav**
MCP, M.Phil, M.C.A., P.hd.(P)
Director of Planning Project & University Affairs
St. Xaviers College

**Arpita Banerajee**
M.Sc. (IT), M.Tech.,HOC, CS Dept.
St. Xaviers College

**Vaishali Singh**
MCA, Ph.d (P), Asst. Prof.
St. Xaviers College

**Chitresh Banerjee**
MCA, M.Tech, Asst. Prof.
AIIT Amity University

### Special Thanks

Principal
St. Xavier's College Jaipur
Nevta-Mahapura Road, Jaipur

**Price : ₹ 250.00**

Principal
St. Xavier's College Jaipur
Nevta-Mahapura Road, Jaipur

# Contents

Principal
St. Xavier's College Jaipur
Nevta-Mahapura Road, Jaipur

## SYLLABUS

*Part I (very short answer)* consists 10 questions of two marks each with two questions from each unit. Maximum limit for each question is up to 40 words.
*Part II (short answer)* consists of 5 questions of four marks each with one question from each unit. Maximum limit for each question is up to 80 words.
*Part III (Long answer)* consists 5 questions of twelve marks each with one question from each unit with internal choice.

### UNIT-I

**Introduction to Systems Design Environment:**

Systems Development Approaches-Function Oriented. Data Oriented, Object Oriented, Development Process, Methodologies, Tools, Modeling Methods, Processing Types and Systems, Batch Processing, Realtime Processing.

SystemDevelopment Life Cycle, Linear or Waterfall Cycle, Linear cycle phase problem definition, system specification, system design, system development, testing, maintenance Problems with Linear Life Cycle, Iterative Cycles, Spiral model Requirements analysis, Importance of Communication, Identifying Requirements, Data and Fact Gathering Techniques, Feasibility Studies, Introduction to Prototyping, Rapid Prototyping Tools, Benefits of prototyping.

### UNIT-II

**System Design:** Interface design tools, user interface evaluations, Introduction to Process Modeling, Introduction to Data Modeling. System Design Techniques, Document Flow Diagrams, Documents, Physical Movement of documents, Usefulness of Document Flow diagram, Data Flow Diagrams, DFD notation, Context diagram DFD leveling, Process descriptions structured English, Decision Trees and Decision Tables, Entity Relationship Diagrams, Entities, Attributes, Relationship, Degree, Optionality, Resolving many to many relationship, Exclusive relationship, structure Charts, Mud tiles, Parameter passing. Executkm sequence, S tn intiired Design, Conversion from Data Flow Diagrams to Structure Charts.

### UNIT -III

**Testing fundamentals:** Objectives, principles, testability, Test cases: White box & Black box testing strategies: verilicatinn & validation, tcst, ifltegraEion testing, validation, testing, system testing, System Implementation, Maintenance and documentation, Document Conliguratinns Maintaining a Configuration.

### UNIT- IV

S/W Project planning Objectives, Decomposition techniques S/W Sizing, Problem-based estimation, Process based estimation, Cost Estimation Models COCOMO Model.
**S/W Design :** Objectives, Principles, Concepts, Design methodologies Data design, Architectural design, procedural design, Objectoriented concepts.

### UNIT- V

**An overview of Lanagement Information System:** Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS : Information requirements & Levels of Management, Simon's Model of decision-Making, Structured Vs Un-strucwred déisions, Formal Vs. Informal systems.

# 1

# INTRODUCTION TO SYSTEMS DESIGN ENVIRONMENT FUNCTION ORIENTED DESIGN

Software design is a process to conceptualize the software requirements into software implementation. Software design takes the user requirements as challenges and tries to find optimum solution. While the software is being conceptualized, a plan is chalked out to find the best possible design for implementing the intended solution.

There are multiple variants of software design. Let us study them briefly:

## Structured Design

Structured design is a conceptualization of problem into several well-organized elements of solution. It is basically concerned with the solution design. Benefit of structured design is, it gives better understanding of how the problem is being solved. Structured design also makes it simpler for designer to concentrate on the problem more accurately.

Structured design is mostly based on 'divide and conquer' strategy where a problem is broken into several small problems and each small problem is individually solved until the whole problem is solved.
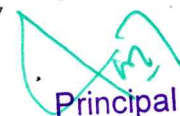
The small pieces of problem are solved by means of solution modules. Structured design emphasis that these modules be well organized in order to achieve precise solution.

These modules are arranged in hierarchy. They communicate with each other. A good structured design always follows some rules for communication among multiple modules, namely -

**Cohesion** - grouping of all functionally related elements.

**Coupling** - communication between different modules.

A good structured design has high cohesion and low coupling arrangements.