Biyani's Think Tank

Concept based notes

System analysis and Design

MCA

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Preface

I am glad to present this book, especially designed to serve the needs of the students. The book has been written keeping in mind the general weakness in understanding the fundamental concepts of the topics. The book is self-explanatory and adopts the “Teach Yourself” style. It is based on question-answer pattern. The language of book is quite easy and understandable based on scientific approach.

Any further improvement in the contents of the book by making corrections, omission and inclusion is keen to be achieved based on suggestions from the readers for which the author shall be obliged.

I acknowledge special thanks to Mr. Rajeev Biyani, *Chairman* & Dr. Sanjay Biyani, *Director* (*Acad.*) Biyani Group of Colleges, who are the backbones and main concept provider and also have been constant source of motivation throughout this endeavour. They played an active role in coordinating the various stages of this endeavour and spearheaded the publishing work.

I look forward to receiving valuable suggestions from professors of various educational institutions, other faculty members and students for improvement of the quality of the book. The reader may feel free to send in their comments and suggestions to the under mentioned address.

Author

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Syllabus

Unit I: System Concepts and Information Systems Environment: The System Concept: Definition, Characteristics of Systems, Elements of a System, Open and Closed System, Formal and Informal Information Systems, Computer based Information Systems, Management Information System, Decision Support System, General Business Knowledge, and Interpersonal Communicational System.

Unit II : System Development Life Cycle: Recognition of needs, Impetus for System Change, Feasibility Study, Analysis, Design, Implementation, Post implementation and Maintenance. Role of the Systems Analyst, The Analyst/User Interface, Behavioral issues.

Unit III: Systems Planning and Initial Investigation: Strategies for Determining Information Requirement, Problem Definition & Project initiation, Background Analysis, Fact Analysis, Review of Written Documents, Onsite Observations, Interviews and Questionnaires, Fact Analysis, Performance Analysis, Efficiency Analysis, Service Analysis.

Unit IV: Information Gathering: need, Information about the firms, Information gathering tools, Interviewing, Arranging the Interview, Guides to a Successful Interview, Types of Interviews and Questionnaires, The Structured and Unstructured Alternatives.

Unit V: Tools of Structured Analysis: The Dataflow Diagram (DFD), Data Dictionary, Decision Trees and Structured English.

Unit VI: Feasibility Study: System performance, Economic Feasibility, Technical Feasibility, Behavioral

Unit VII: Input/output and Forms Design: Input Design, CRT Screen Design, Output Design, and Requirements of form Design. H/W / S/W Selection, Make V/s Buy decision and Maintenance, Documentation: Importance, Types of documentation, Security and disaster planning and management.

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Unit I

System Concepts and Information system environment

Introduction:

System analysis is the application or function of the system concept or system approach to solve the problem using computers. To solve the problem one must have knowledge of system and how an organization works in a system.

Q.1 Define System and explain its characteristics.

Ans.: A System means an organized relationship among functioning units or components. It is an orderly grouping of interdependent components linked together according to a plan to achieve a specific objective. The elements of the system are as under:

(1) **Outputs and Inputs:** A major objective of a system is to produce an output that has value to its user. Whatever the nature of the output, it must be in line with the expectations of the intended user. Inputs are the elements that enter the system for processing and output is the outcome of the processing.

(2) **Processors:** The processor is the element of the system that involves the actual transformation of input into output. It is the operational component of a system. Processors modify the input totally or partially.

(3) **Control :** The control element guides the system. It is the decision-making subsystem that controls the pattern of activities governing input, processing and output.

(4) **Feedback :** Control in a dynamic system is achieved by feedback. Feedback measures output against a standard in some form that includes

communication and control. Feedback may be positive or negative, routine or informational.

(5) **Environment:** It is the source of external elements that impinge on the system. It determines how a system must function.

(6) **Boundaries and Interfaces:** A system should be defined by its boundaries- the limits that identify its components, processes and interrelationships when it interfaces with another system.

The characteristics of a system are as under :

(1) **Organization:** It implies structure and order. It is the arrangement of components that helps to achieve objectives.

(2) **Interaction :** It refers to the manner in which each component functions with other component of the system. In an organization, for example, purchasing must interact with production, advertising with sales, etc.

(3) **Interdependence :** It means that parts of the organization or computer system depend on one another. They are coordinated and linked together according to a plan. One subsystem depends on the input of another subsystem for proper functioning.

(4) **Integration :** It refers to the completeness of systems. It is concerned with how a system is tied together. It is more than sharing a physical part or location. It means that parts of a system work together within the system even though each part performs a unique function.

(5) **Central Objective :** Objectives may be real or stated. Although a stated objective may be the real objective, it is not uncommon for an organization to state one objective and operate to achieve another.

Q.2 Explain the different types of Processing Systems.

Ans.: Batch processing is execution of a series of programs ("jobs") on a computer without human interaction. Batch jobs are set up so they can be run to completion without human interaction, so all input data is preselected through scripts or command-line parameters. This is in contrast to "online" or interactive programs which prompt the user for such input.

Batch processing has these benefits :

- It allows sharing of computer resources among many users,
- It shifts the time of job processing to when the computing resources are less busy,
- It avoids idling the computing resources with minute-by-minute human interaction and supervision,
- By keeping high overall rate of utilization, it better amortizes the cost of a computer, especially an expensive one.

Distributed computing deals with hardware and software systems containing more than one processing element or storage element, concurrent processes, or multiple programs, running under a loosely or tightly controlled regime.

In distributed computing a program is split up into parts that run simultaneously on multiple computers communicating over a network. Distributed computing is a form of parallel computing, but parallel computing is most commonly used to describe program parts running simultaneously on multiple processors in the same computer. Both types of processing require dividing a program into parts that can run simultaneously, but distributed programs often must deal with heterogeneous environments, network links of varying latencies, and unpredictable failures in the network or the computers.

Distributed programming typically falls into one of several basic architectures or categories: Client-server, 3-tier architecture, N-tier architecture, Distributed objects, loose coupling, or tight coupling.

- **Client - Server :** Smart client code contacts the server for data, then formats and displays it to the user. Input at the client is committed back to the server when it represents a permanent change.
- **3-tier Architecture :** Three tier systems move the client intelligence to a middle tier so that stateless clients can be used. This simplifies application deployment. Most web applications are 3-Tier.
- **N-tier Architecture :** N-Tier refers typically to web applications which further forward their requests to other enterprise services. This type of application is the one most responsible for the success of application servers.
- **Tightly Coupled (Clustered) :** Refers typically to a cluster of machines that closely work together, running a shared process in parallel. The task

is subdivided in parts that are made individually by each one and then put back together to make the final result.

- **Peer-to-Peer :** an architecture where there is no special machine or machines that provide a service or manage the network resources. Instead all responsibilities are uniformly divided among all machines, known as peers. Peers can serve both as clients and servers

The time between the presentation of a set of inputs and the appearance of all the associated outputs is called the response time. A **real-time system** is one that must satisfy explicit bounded response time constraints to avoid failure. Equivalently, a real-time system is one whose logical correctness is based both on the correctness of the outputs and their timeliness. Notice that response times of, for example, microseconds are not needed to characterize a real-time system - it simply must have response times that are constrained and thus predictable. In fact, the misconception that real-time systems must be "fast" is because in most instances, the deadlines are on the order of microseconds. But the timeliness constraints or deadlines are generally a reflection of the underlying physical process being controlled. For example, in image processing involving screen update for viewing continuous motion, the deadlines are on the order of 30 microseconds.

An important concept in real-time systems is the notion of an event, that is, any occurrence that results in a change in the sequential flow of program execution. Events can be divided into two categories: synchronous and asynchronous. Synchronous events are those that occur at predictable times such as execution of a conditional branch instruction or hardware trap. Asynchronous events occur at unpredictable points in the flow-of-control and are usually caused by external sources such as a clock signal. Both types of events can be signaled to the CPU by hardware signals

Q.3 What are the different types of systems?

Ans.:

i. Physical or Abstract systems:-

Physical systems are tangible entities that may be static or dynamic in nature. Physical entities can be seen and counted.

Abstract system are conceptual or nonphysical entites.

ii. Open or Closed system:-

In an open system, system take input from the outside and give the proccessd data as an output. Characteristics of open system are as input from outside, entropy, process, output and cycles, differentiation, equifinality.

In a closed system, system does not take input from outside world as well does not provide any type of output to the outside world. In reality closed systems are rare.

iii. Man-Mad information system:-

Man-Mad information system can be of following types:-

- **Formal Information system:-**

  A formal information system is based on the orgainzation represented by the organization chart.

- **Informal Information system:-**

  The informal information system is employee based system designed to meet personal and vocational need of the system

- **Computer-Based Information System:-**

  Computer-Based Information System relies on computer for handling business application.

  It have following types:-

a) Management Information System:-

   Management information system is a person-machine system and highly integrated collection of information processing functions.

b) Decision Support System:- A set of interrelated computer programs and the data vital to assist with analysis and decision-making within an organization.

c.) Data Processing System:-

In information processing, a Data Processing System is a system

which processes data which has been captured and determined in a format identifiable by the data processing system or has been created and stored by another component of an information processing system.

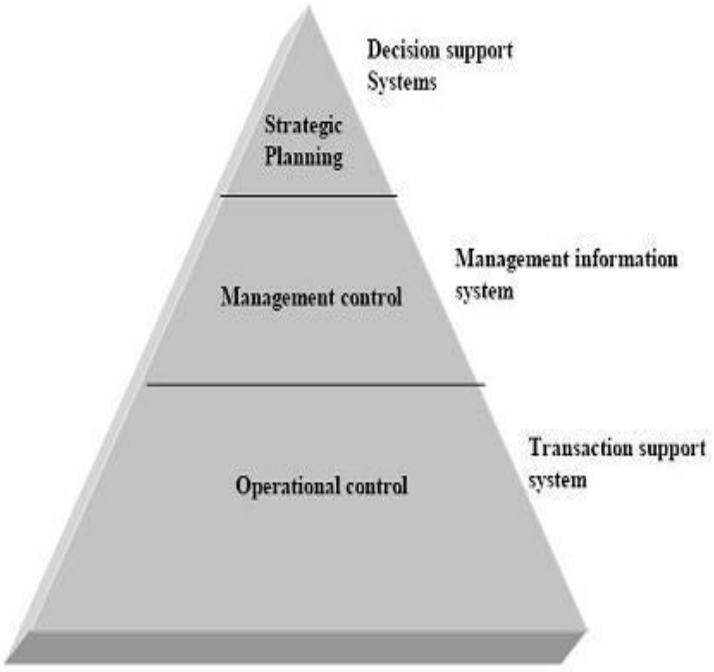

Figure 1 Computer based information system

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Case study

You are in a coffee shop across the street from office having lunch. A customer walks up to the counter. You observe the following:

Customer: Hi Dimple; I'd like a burger to go.

Dimple(waitress): Anything else?

Customer: Yes, a small order of fries and cold coffee.

Dimple: That'll be 82.35 Rs only.

She collects the cash and places the order through an electronic cash register that automatically displays the order on a TV screen in the back room where orders are prepared. When the order is ready, Dimple puts it in a bag and hands it to the customer.

Assignment

a.) Explain the pattern of this system in action. Specifically discuss the following:

i.) The organization system's characteristics.

ii.) The subsystem, information flow, and interfaces.

iii.) The types of interdependence in the organization structure and the nature of feedback.

iv.) Input/output and environment

v.) Formal and Informal information system

b.) If you were to improve the performance of the system , what would you do? How? Explain.

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Unit-2

System Development Life Cycle

Introduction:

System Development and Life Cycle(SDLC) is an approach or a concept which is the collection of tools and technologies that help to convert a manual system into the computerized automated system or to develop the new one. Generally, there are six phases in the SDLC viz. Initial investigation, Feasibility study, Analysis, Design, Implementation, Post- implementation and maintenance.

Q.1 Describe System Development Life Cycle and explain its various phases.

Ans.: The Systems Development Life Cycle (SDLC) is a conceptual model used in project management that describes the stages involved in an information system development project from an initial feasibility study through maintenance of the completed application. Various SDLC methodologies have been developed to guide the processes involved including the waterfall model (the original SDLC method), rapid application development (RAD), joint application development (JAD), the fountain model and the spiral model. Mostly, several models are combined into some sort of hybrid methodology. Documentation is crucial regardless of the type of model chosen or devised for any application, and is usually done in parallel with the development process. Some methods work better for specific types of projects, but in the final analysis, the most important factor for the success of a project may be how closely particular plan was followed.

Feasibility : The feasibility study is used to determine if the project should get the go-ahead. If the project is to proceed, the feasibility study will produce a project plan and budget estimates for the future stages of development.

Requirement Analysis and Design : Analysis gathers the requirements for the system. This stage includes a detailed study of the business needs of the organization. Options for changing the business process may be considered. Design focuses on high level design like, what programs are needed and how are they going to interact, low-level design (how the individual programs are going to work), interface design (what are the interfaces going to look like) and data design (what data will be required). During these phases, the software's overall structure is defined. Analysis and Design are very crucial in the whole development cycle. Any glitch in the design phase could be very expensive to solve in the later stage of the software development. Much care is taken during this phase. The logical system of the product is developed in this phase.

Implementation : In this phase the designs are translated into code. Computer programs are written using a conventional programming language or an application generator. Programming tools like Compilers, Interpreters, Debuggers are used to generate the code. Different high level programming languages like C, C++, Pascal, Java are used for coding. With respect to the type of application, the right programming language is chosen.

Testing : In this phase the system is tested. Normally programs are written as a series of individual modules, these are subject to separate and detailed test. The system is then tested as a whole. The separate modules are brought together and tested as a complete system. The system is tested to ensure that interfaces between modules work (integration testing), the system works on the intended platform and with the expected volume of data (volume testing) and that the system does what the user requires (acceptance/beta testing).

Maintenance : Inevitably the system will need maintenance. Software will definitely undergo change once it is delivered to the customer. There are many reasons for the change. Change could happen because of some unexpected input values into the system. In addition, the changes in the system could directly affect the software operations. The software should be developed to accommodate changes that could happen during the post implementation period.

Q.2 What is the role of a Systems Analyst?

Ans.: System Analysts bridges the gap that always exists between those who need computer-based business solutions. They understand both business and computing. They study business problems and opportunities and then transform business and information requirements into specifications for information systems that will be implemented by various technical specialists including computer programmers. System Analysts initiate change within an organization. Every new system changes the business. System Analyst is basically a problem solver.

An analyst must possess various skills to effectively carry out the job. Specifically, they may be divided, into two categories: Interpersonal and technical skills. Both are required for system development. *Interpersonal* skills deal with, relationships and the interface .of the analyst with people in business. They are useful in establishing trust's resolving conflict, and communicating information. Technical skills, on the other hand, focus an procedures and techniques for operations analysis, systems analysis, and computer science

The **interpersonal skills** relevant to systems work include the following :

- Communication
- Understanding
- Foresightedness and Vision
- Adaptability and Flexibility Skills
- Teaching
- Selling
- Patience and Rationality
- Management Skills
- Leadership Quality
- Training and Documentation Capability

Technical skills include:

- Creativity-

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- Problem solving-
- Project management-
- Dynamic interface-
- Questioning attitude and inquiring mind-
- Knowledge-

Q.3 **What are the models and different types of models?**

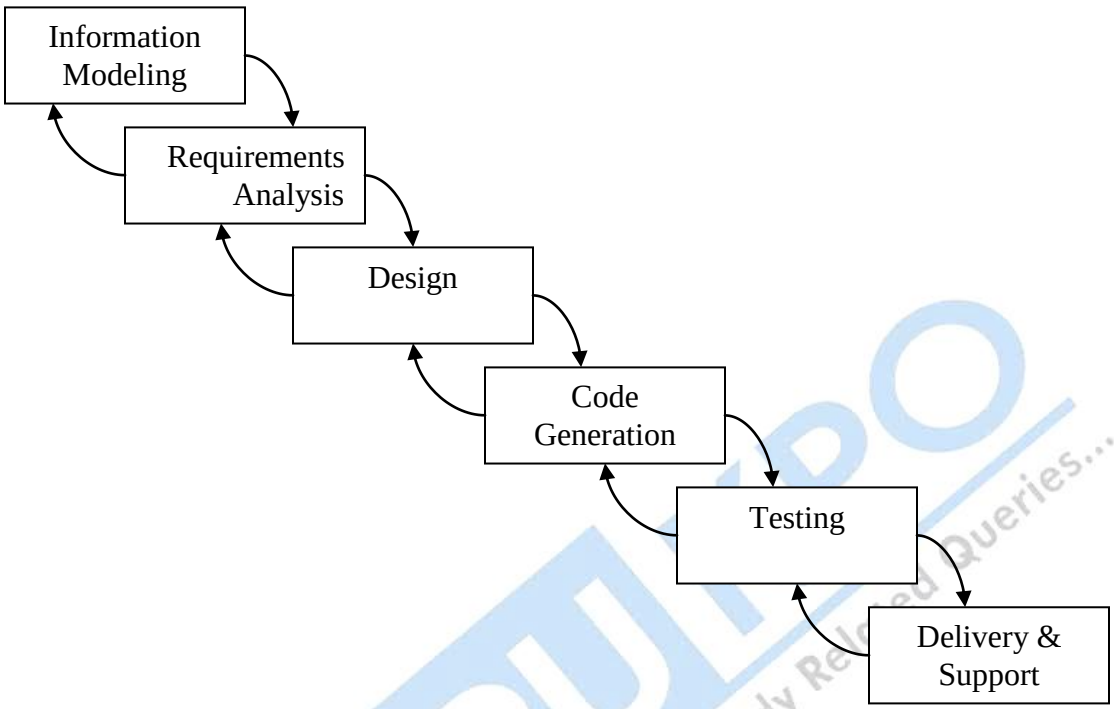
a.) Waterfall model or Classic Life Cycle Model or Linear Sequential Model

b.) Prototype process model

Ans.:

a.) **Waterfall Model**

Sometimes called the *classic life cycle or the linear sequential model,* the *waterfall model* is a systematic, sequential approach to software development in which development is seen as flowing downwards (like a waterfall) that begins at the system level and progresses through analysis, design, coding, testing and support. To follow the waterfall model, one proceeds from one phase to the next in a sequential manner. For example, one first completes "requirements specification". When the requirements are fully completed, one proceeds to design. The software is designed (on paper) and this design should be a plan for implementing the requirements given. When the design is fully completed, an implementation of that design, i.e. coding of the design is made by programmers. After the implementation phases are complete, the software product is tested and debugged; any faults introduced in earlier phases are removed here. Then the software product is installed, and later maintained to add any new functions that the user needs and remove bugs. Thus in a waterfall model, we can move to the next step only when the previous step is completed and removed of all errors. There is no jumping back and forth or overlap between the steps in a waterfall model.



The model consists of six distinct stages, namely :

(1) In the *Information Modelling* phase

(a) Work begins by gathering information related to the existing system. This will consists of all items consisting of hardware, people, databases etc.

(2) In the *requirements analysis* phase

(a) The problem is specified along with the desired objectives (goals).

(b) The constraints are identified.

(c) All information about the functions, behaviour, and performance are documented and checked by the customers.

(3) In the *design phase*, all inputs, computations and outputs of the system should be converted into a software model so that it can be coded by programmers. The hardware requirements are also determined at this stage along with a picture of the overall system architecture.

(4) In the *code generation* phase, the design has to be translated into a machine-readable form using any of the programming languages available that is suitable for the project.

(5) In the *testing* phase stage

(a) Once code is generated, testing begins.

(b) It focuses on all the statements of the software and removes all errors.

(c) It ensures that proper input will produce actual results.

(d) Detailed documentation from the design phase can significantly reduce the coding effort.

(6) The *delivery and support* phase consists of delivering the final product to the customer and then taking care of the maintenance of the product. In this phase the software is updated to :

(a) Meet the changing customer needs

(b) Adapted to accommodate changes in the external environment

(c) Correct errors that were not previously known in the testing phases

(d) Enhancing the efficiency of the software

b.) Prototype Process Model

The prototyping model begins with the requirements gathering. The developer and the customer meet and define the objectives for the software, identify the needs, etc. A 'quick design' is then created. This design focuses on those aspects of the software that will be visible to the customer. It then leads to the construction of a prototype. The prototype is then checked by the customer and any modifications or changes that are required are made to the prototype. Looping takes place in this process and better versions of the prototype are created. These are continuously shown to the user so that any new changes can be updated in the prototype. This process continues till the user is satisfied with the system. Once a user is satisfied, the prototype is converted to the actual system with all considerations for quality and security.

The prototype is considered as the 'first system'. It is advantageous because both the customers and the developers get a feel of the actual system. But there are certain problems with the prototyping model too.

(1) The prototype is usually created without taking into consideration overall software quality.

(2) When the customer sees a working model in the form of a prototype, and then is told that the actual software is not created, the customer can get irritated.

(3) Since the prototype is to be created quickly, the developer will use whatever choices he has at that particular time (eg, he may not know a good programming language, but later may learn. He then cannot change the whole system for the new programming language). Thus the prototype may be created with less-than-ideal choices.

Q.4 Describe the Rapid Application Development Model. State its disadvantages.

Ans.: Rapid Application Development (RAD) is an incremental software development process model that focuses on a very short development cycle. The RAD model is a 'high-speed' version of the linear sequential model. It enables a development team to create a fully functional system within a very short time period (e.g. 60 to 90 days).

Business Modeling : The information flow among business functions is modeled in a way that answers the following questions :

What information drives the business process?

What information is generated?

Who generates it?

Where does the information go?

Who processes it?

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Data Modeling : It gives all the details about what data is to be used in the project. All the information found in the business modeling phase is refined into a set of data objects and the characteristics and the relationships between these objects are defined.

Process Modeling : Here all the processes are defined that are needed to use the data objects to create the system. Processing descriptions are created for adding, modifying, deleting, or retrieving a data object.

Application Generation : RAD makes use of the fourth generation techniques and tools like VB, VC++, Delphi etc rather than creating software using conventional third generation programming languages. The RAD reuses existing program components (when possible) or creates reusable components (when necessary). In all cases, automated tools (CASE tools) are used to facilitate construction of the software.

Testing and Turnover : Since the RAD process emphasizes reuse, many of the program components have already been tested. This minimizes the testing and development time.

If a business application can be divided into modules, so that each major function can be completed within the development cycle, then it is a candidate for the RAD model. In this case, each team can be assigned a model, which is then integrated to form a whole.

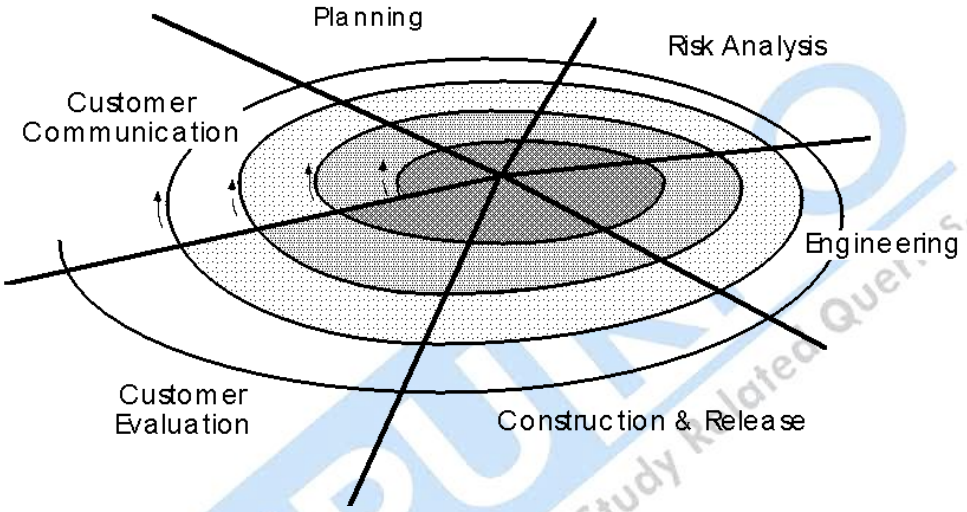
Disadvantages :

- For Large projects, RAD requires sufficient resources to create the right number of RAD teams.
- If a system cannot be properly divided into modules, building components for RAD will be problematic
- RAD is not appropriate when technical risks are high, e.g. this occurs when a new application makes heavy use of new technology.

Q.5 Explain the Spiral Model. What are the advantages of this model?

Ans.: The spiral model, combines the iterative nature of prototyping with the controlled and systematic aspects of the waterfall model, therein providing the

potential for rapid development of incremental versions of the software. In this model the software is developed in a series of incremental releases with the early stages being either paper models or prototypes. Later iterations become increasingly more complete versions of the product.



As illustrated, the model is divided into a number of task regions.

These regions are :

(1) The **customer communication** task – to establish effective communication between developer and customer.

(2) The **planning** task – to define resources, time lines and other project related information..

(3) The **risk analysis** task – to assess both technical and management risks.

(4) The **engineering** task – to build one or more representations (prototypes) of the application.

(5) The **construction and release** task – to construct, test, install and provide user support (e.g., documentation and training).

(6) The **customer evaluation** task – to obtain customer feedback based on the evaluation of the software representation created during the engineering stage and implemented during the install stage.

The evolutionary process begins at the centre position and moves in a clockwise direction. Each traversal of the spiral typically results in a deliverable. For example, the first and second spiral traversals may result in the production of a product specification and a prototype, respectively. Subsequent traversals may then produce more sophisticated versions of the software.

An important distinction between the spiral model and other software models is the explicit consideration of risk. There are no fixed phases such as specification or design phases in the model and it encompasses other process models. For example, prototyping may be used in one spiral to resolve requirement uncertainties and hence reduce risks. This may then be followed by a conventional waterfall development.

Advantages of the Spiral Model :

- The spiral model is a realistic approach to the development of large-scale software products because the software evolves as the process progresses. In addition, the developer and the client better understand and react to risks at each evolutionary level.
- The model uses prototyping as a risk reduction mechanism and allows for the development of prototypes at any stage of the evolutionary development.
- It maintains a systematic stepwise approach, like the classic life cycle model, but incorporates it into an iterative framework that more reflect the real world.
- If employed correctly, this model should reduce risks before they become problematic, as consideration of technical risks are considered at all stages.

Q.6 Explain Information Gathering Process for System Development.

OR

Explain Fact Finding Method of System Analysis.

Ans.: Fact finding means learning as much as possible about the present system. The tools used in information gathering or fact finding are

(1) **Review of Written Documents :** In all organizations documents such as forms, records, reports, manuals, etc are available. These help in determining how the present system runs. The process of fact finding includes collection of all possible documents and evaluating them. Unfortunately, most manuals are not up to date and may not be readable. The analyst needs to find out how the forms are filled out, what changes need to be made and how easy they are to read.

(2) **On-Site Observation :** The purpose of on-site observation is to get as close as possible to the real system being studied. It is the process of recognizing and noting people, objects and occurrences to obtain information. As an observer the analyst must follow a set of rules. He/she must listen than talk and not give advice or pass a moral judgment, must not argue or show friendliness towards others. The following questions can serve as a guide for on-site observations:

- What kind of system is it? What does it do?
- Who runs the system? Who are the important people in it?
- What is the history of the system?

(3) **Interviews :** An interview is a face to face interpersonal situation in which a person called the interviewer asks a person being interviewed, questions designed to gather information about a problem. The analyst or interviewer can schedule interviews with key personnel of the organization. The analyst also needs to conduct detailed interviews with all the people who will actually use the system. This will provide all the details the analyst needs and also remove any fear from the users that the computers will replace the. Interviews help gather vital facts about the existing problems, such as lack of quality control or security, etc. Interviewing needs a friendly atmosphere so that the interviewer can ask questions properly, obtain reliable and correct answers and record the answers accurately and completely.

(4) **Questionnaires :** A questionnaire is a tool that has questions to which individuals respond. A questionnaire has the following advantages:

- It is economical and requires less skill than an interview.

- It can be used to gather data from large number of people simultaneously
- It is a uniform method in which all question asked are the same to all people
- The users are happy as they know that the answers they give are confidential
- User get time to think about the questions and so can give more accurate results than in an interview

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Case study

The vice president of a large retail store wants to modify is order entry system. He states the problem as follows: "I need a report that gives me information about the previous or old records."

Assignment:

a.) Outline the procedure which you follow. [hint: follow the steps of SDLC]

b.) What questions would you ask?

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Unit-3

System Planning and Initial Investigation

Introduction:

System Planning and the Initial investigation both are the most critical and important part of any project life cycle. A wrong initial investigation and planning can lead the system to the failure.

Q.1 What is planning? what are the bases for planning in System Analysis?

Ans.: Planning is the process of setting goals, developing strategies and outlining task and program to accomplish the goal.

Planning the information system in the business is very important in today's competitive environment to make the business high grow able, and to make business retain in adverse conditions because:-

a.) Information is very important recourse for any company to be managed and it is equally important as the cash, personnel etc.

b.) Financial resources are committed to the information system.

c.) To make the system growing and retain in the competitive environment.

Q.2 What is initial investigation? What are the strategies for determining information requirements?

Ans.: First step in SDLC is the identification of the user's need. The initial investigation is one way to do this. Another objective at this stage is to determine whether the user's need is feasible or not.

Strategies for determining information requirements are:-

1.) Asking.

2.) Getting information from present system.

3.) Prototyping.

Q.3 What are the steps in the initial investigation?

Ans.: Initial investigation have following steps:-

1.) Problem definition.

Problem definition is the process of identifying the need of the user which led him to request for the system change.

2.) Background analysis:-

Background analysis is the process of getting the basic information about the customer's company or organization i.e. How it really works? What people are involved in it? Etc.

Background analysis helps the system analyst to prepare the organization chart with the list of people and functions.

3.) Fact finding:-

After obtaining the background information, analyst start gathering the data like input, output and cost of the existing system. Information can be gathered by following tools:-

a.) Review of written documents.

b.) On-site observations

c.) Interview and questionnaires

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4.) Fact Analysis :-

After the collection of data it must be organized and evaluated so that report can be prepared for the final approval from the user.

5.) Determination of Feasibility:-

After organizing data, and fact analysis feasibility is evaluated and determine that any alternative proposal is possible or not for the customer's

Project.

Case study

Allied concrete, Inc., has had to renovate its approach to maintain a computer system and converting application. Recently management has established a direction-finding committee to supervise and support all applications before they are run on the mainframe. The committee consists of one member from each of the following areas: accounting, sales, production, and information system. The committee is chaired by the vice president in charge of production. The primary charge is to review each user request and approve or disapprove it based on feasibility and priority. If a request is approved, the user department is billed for its includes computer time, analyst and programmer time, and supplies. All department heads have agreed to the new policy.

In formalizing the committee's authority and responsibilities, serious questions were raised by several user departments about whether the committee has the authority to turn down a project even if it is project out of their budget, there is no reason for it to be rejected.

Assignment:

a.) Should all user projects that are operationally and technically feasible be developed as long as the user is paying the price? If so, what should be the role of the direction-finding committee?

b.) What do you think of the makeup of the direction-finding committee? What role should the analyst, programmer, or data base specialist play in a direction-finding committee? Elaborate.

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Unit-4

Information Gathering

Introduction:

The key part of feasibility analysis is Information Gathering about the present system. Improper and wrong gathering of information may lead the system to the failure. The mistaken gathering of data at the initial level affects the system life cycle at every phase and finally causes the system failure. There are many tools and techniques that help to collect the correct and efficient data that help to develop the system which satisfy the needs of customer.

Q.1 What is information gathering?

Ans Information gathering is an art and science of gathering information regarding present system so that designing a new system will be easy as well as free from errors and upto the customer requirement.

Q.2 Where does the information originates?

Ans Information is gathered from main principal sources:

Primary Internal sources:

1.) Financial reports.

2.) Personal staff.

3.) Professional staff, EDP

4.) System documentaion or manuals.

5.) The user or user staff.

6.) Reports and transaction documents.

Primary external resources:

1.) Vendors.

2.) Government documents.

3.) Newspapers and professional journals.

Q.3 What are the tools for information gathering?

Ans Tools for information gathering are:-

1.) Review of Literature, Procedures, and Forms.

Procedures manuals and forms are useful sources for the analyst. They describe the format and functions of the present system. Up-to-date manuals save hours of information-gathering time.

2.) On-Site Observation.

On-Site Observation is the process of recognizing and noting people, objects, and occurrence to obtain information. The major objective of on-site observation is to get as close as possible to the "real" system being studied. The emphasis is not on giving advice or passing moral judgment on what is observed . Furthermore, care is taken not to argue with the persons being observed.

3.) Interviews and Questionnaires.

Interview and Questionnaires used in system analysis are relatively direct. This is the strength because much of the information needed can be acquired by direct questions.

Interview:

Interview is the oldest and most often used device for gathering information. Interview is a face-to-face interpersonal role situation to gather information about a problem area.

Guidelines for successesful Interview:

a.) Set the stage for the interview.

b.) Establish rapport: put the interviewee at ease.

c.) Phase questions clearly.

d.) Be good listener, avoid arguments.

e.) Evaluate the outcome of the interview.

Questionnaires:

Questionnaires are used for almost any tool that has questions to which individuals respond. It requires less skills and time then interview. The questionnaires place less pressure on subject for immediate responses.

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Case Studies:

A large wholesale juice distributer has been having difficulty keeping inventory up to date because incoming shipments are not processed quickly enough. The sales force can never be assured which brands and quantities are existing for sale. The vice president of sales asks an outside analyst to examine the problem.

The analyst arrived at the computer center Monday at 8:00 A.M. He asked to see the manager. The receptionist told him that Mr. Arvind came around 9.00 A.M. Not wanting to waste an hour, the analyst determined to interview the programmers to learn about inventory control.

Mr. Arvind arrived at 8.45. He was furious to find that the analyst has taken the liberty to his staff without his consent. He promptly told the analyst that Monday is a bad day. The programmers could no be interrupted before 3.30 P.M on Tuesday. The analyst decided to come then. in the meantime, he went to stockroom to watch stock keeping activities.

The next day, the analyst interviewed more employees in the stockroom and the clerical staff of the warehouse. It was 4.30 P.M then he remembers his appointment with manager of the computer center. He suddenly ended his work in the warehouse and rushed back to the computer center for the interview. The manager had been waiting for an hour and was in an irritable mood. To make things worse, the firm's employees quit work at 5:00 P.M. The manager decided to go ahead with the interview.

The analyst inquired about data capture, stock activities, data flow, processing routines, and stock status reports. After a brief rundown on the procedures used and the report generated, the analyst was curtly dismissed. It was 5:00 P.M

The analyst had more questions to ask but had to stop. At the same time, he was wondering why the manager was so irritable throughout the interview.

a.) How do you assess the analyst's performance on the job? Explain.

b.) Evaluate the procedure the analyst used in meeting the manager of the computer center.

c.) How adequately prepared was the analyst for the first interview?

d.) If you were the system analyst, would you have handled this project? Elaborate.

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Unit-5

Tools of Structured Analysis

Introduction:

Tools of structured analysis overcome the drawbacks of traditional tools used for data gathering. Structured tools such as Data Flow Diagram, Data Dictionary, and Structure English provide alternative ways to design candidate system. Some real-life applications requerie the combination of both structured tools as well as traditional tools.

Q.1 What is structured analysis?

Ans.: Structured analysis is a set of techniques and graphial tools that allow the analyst to develop a new kind of system specification that are easily understandable to the user.

Q.2 What are the tools of structured analysis and design? Describe each tool.

1.) Data Flow Diagram.

2.) Data Dicitionary.

3.) Structured English

4.) Dicision Tree.

5.) Dicision Tables

6.) Context Diagram

7.) E-R Diagram

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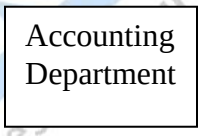
Ans.:

1) Data Flow Diagram(DFD):-

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system. It describes the system's data and how the processes transform the data in a graphical manner. Data flow diagrams can be used to provide a clear representation of any business function. It starts with an overall picture of the business and continues by analyzing each of the functional areas of interest. It uses a top-down approach to show all the levels of the functions of the system. Initially a **context diagram** is drawn, which is a simple representation of the entire system under investigation. This is followed by a level 1 diagram; which provides an overview of the major functional areas of the business. The level 1 diagram identifies the major business processes at a high level and any of these processes can then be analyzed further - giving rise to a corresponding level 2 business process diagram. This process of more detailed analysis can then continue – through level 3, 4 and so on.

DFD Notation :

A rectangle



It denotes an external entity. It defines a source or destination of system data. It can represent a person, group of people, department, or some other system.

A circle

It denotes a process or activity. It is also known as a bubble. It shows how the system transforms inputs into outputs. Each process is named.

A line with an arrowhead

It denotes the direction of data flow. The input to, or output from, a given process, which is associated with each arrow in a DFD.

Open Rectangle

CUSTOMER

It denotes a store that is used to model collection of data. It may refer to files or databases, or data stored on punched cards, optical disk, etc. It is shown by two parallel lines with the name of the data store between them

2.) Data Dictionary.

A Data Dictionary (DD) is a structured repository of data about data. It is a set of accurate definitions of all DFD data elements and data structures. A data dictionary defines each term encountered during the analysis and design of a new system. Data dictionary is the place where we keep the details of the contents of data flows, data stores & processes.

Without a data dictionary the development of large systems becomes difficult. The data dictionary is an effective solution to the problem of complicated nature. The main purpose of a data dictionary is to provide a source of reference in which the analyst, the user, the designer can look up & find out its content and any other relevant information.

The main advantage of a DD is the documentation. It is a valuable reference to the organization which helps in communication between the analyst and the user. It is also important in building a database.

The Data Dictionary notations are

= is composed of

+ AND

( ) Optional value

[ ] Either/Or

{} iteration

** comment

@ identifier (key field)

| separates alternative choices in the [] construct

Examples of Data dictionary –

Name = Courtesy-Title + First-Name + (Middle-Name) + Last-Name

Courtesy-Title = [Mr. | Miss | Mrs. | Ms. | Dr. | Prof.]

First-Name = { Legal-Character }

Last-Name = { Legal-Character }

Legal-Character = [A-Z | a-z |0-9| ' | - | |]

3.) Structured English:-

Structured English or pseudo code or program design language (PDL) uses the vocabulary of English and the syntax of a structured programming. Structured English looks like a modern programming language. The difference between structured English and a real programming language is in the use of narrative text which is placed within the structured English statements. Structured English cannot be compiled. It should have the following characteristics:

- A fixed syntax of keywords used for structured constructs, data declaration
- A free syntax of natural language that describes processing
- Data declaration facilities that include simple(array) and complex(linked list or tree) data structures
- Facility to declare subprograms and call them

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Decisions in Structured English are made through IF, THEN, ELSE, SO, etc.

4.) Decision Tree:-

Decision tree are graphical representation methods of representing a sequence of logical decisions. It is mainly used when decisions need to be taken or for defining policies. A decision tree has as many branches as there are logical alternatives. It is easy to construct, easy to read and easy to update. A decision tree is used to identify the strategy most likely to reach a goal. It is also used as a means for calculating probabilities or making financial or number based decisions. A decision making tree is essentially a diagram that represents, in a specially organized way, the decisions, the main external or other events that introduce uncertainty, as well as possible outcomes of all those decisions and events.

5.) Decision Table:-

Decision tables are a precise yet compact way to model complicated logic. Decision tables, like if-then-else and switch-case statements, associate conditions with actions to perform. But, unlike the control structures found in traditional programming languages, decision tables can associate many independent conditions with several actions in an elegant way. Decision tables are typically divided into four quadrants, as shown below.

The four quadrants	
Conditions	Condition alternatives
Actions	Action entries

Each decision corresponds to a variable, relation or predicate whose possible values are listed among the condition alternatives. Each action is a procedure or operation to perform, and the entries specify whether (or in what order) the

action is to be performed for the set of condition alternatives the entry corresponds to. Many decision tables include in their condition alternatives the **don't care** symbol, a hyphen. Using don't cares can simplify decision tables, especially when a given condition has little influence on the actions to be performed. In some cases, entire conditions thought to be important initially are found to be irrelevant when none of the conditions influence which actions are performed. The limited-entry decision table is the simplest to describe. The condition alternatives are simple boolean values, and the action entries are check-marks, representing which of the actions in a given column are to be performed.

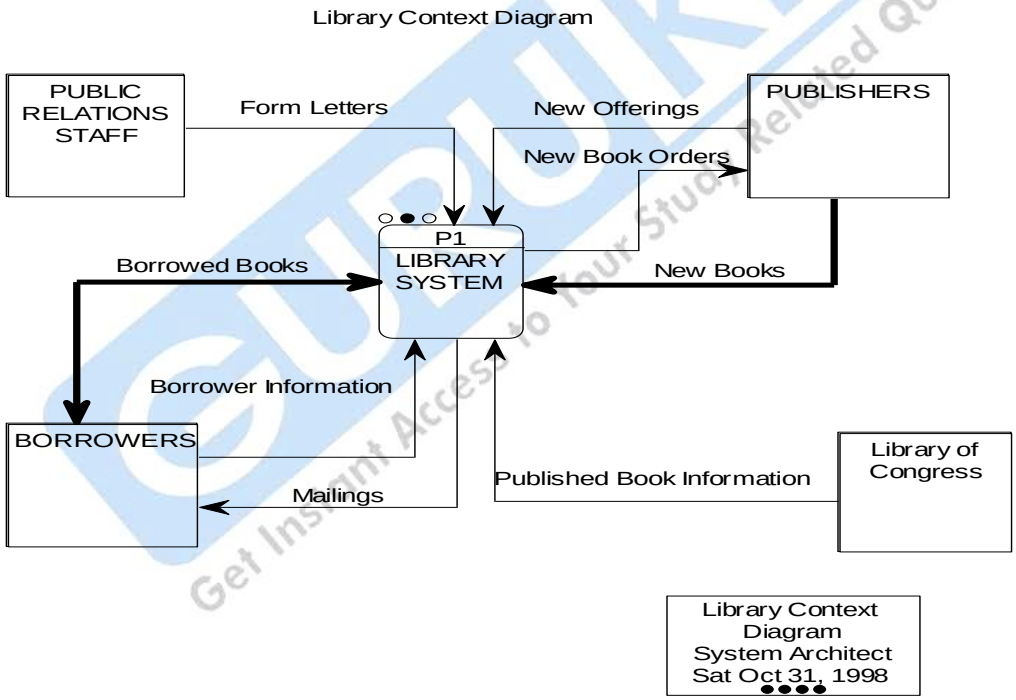
A technical support company writes a decision table to diagnose printer problems based upon symptoms described to them over the phone from their clients.

Printer troubleshooter									
		Rules							
Conditions	Printer does not print	Y	Y	Y	Y	N	N	N	N
	A red light is flashing	Y	Y	N	N	Y	Y	N	N
	Printer is unrecognized	Y	N	Y	N	Y	N	Y	N
Actions	Check the power cable			X					
	Check the printer-computer cable	X		X					
	Ensure printer software is installed	X		X		X		X	
	Check/replace ink	X	X			X	X		
	Check for paper jam		X		X				

Decision tables make it easy to observe that all possible conditions are accounted for. In the example above, every possible combination of the three conditions is given. In decision tables, when conditions are omitted, it is obvious even at a glance that logic is missing. Compare this to traditional control structures, where it is not easy to notice gaps in program logic with a mere glance --- sometimes it is difficult to follow which conditions correspond to which actions!

Just as decision tables make it easy to audit control logic, decision tables demand that a programmer think of all possible conditions. With traditional control structures, it is easy to forget about corner cases, especially when the else statement is optional. Since logic is so important to programming, decision tables are an excellent tool for designing control logic.

6.) Context Diagram:-



The context diagram shown on this screen represents a book lending library. The library receives details of books, and orders books from one or more book suppliers. Books may be reserved and borrowed by members of the public, who are required

to give a borrower number. The library will notify borrowers when a reserved book becomes available or when a borrowed book becomes overdue. In addition to supplying books, a book supplier will furnish details of specific books in response to library enquiries. After the context model is created the process is exploded to the next level to show the major processes in the system. Depending upon the complexity of the system each of these processes can also be exploded into their own process model. This continues until the goal of each process accomplishing a single function is reached. Because of this approach the context model is referred to as Level 0 (Zero) DFD, the next as Level 1 DFD, etc.

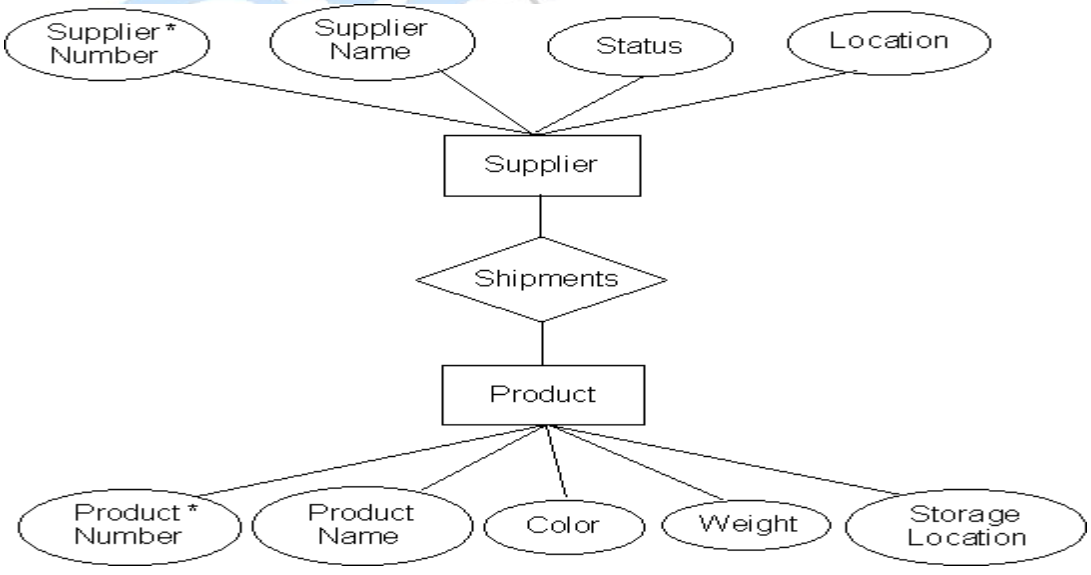
a. E-R diagram

Data models are tools used in analysis to describe the data necessities and assumptions in the system from a top-down point of view. They also set the stage for the design of databases later on in the SDLC.

There are three fundamental elements in ER models:

- Entities are the "things" about which we search for information.
- Attributes are the data we gather regarding the entities.
- Relationships provide the formation needed to describe information from various entities.

In general, ERD's look likes this:



Q.3 What are Structure Charts? Describe.

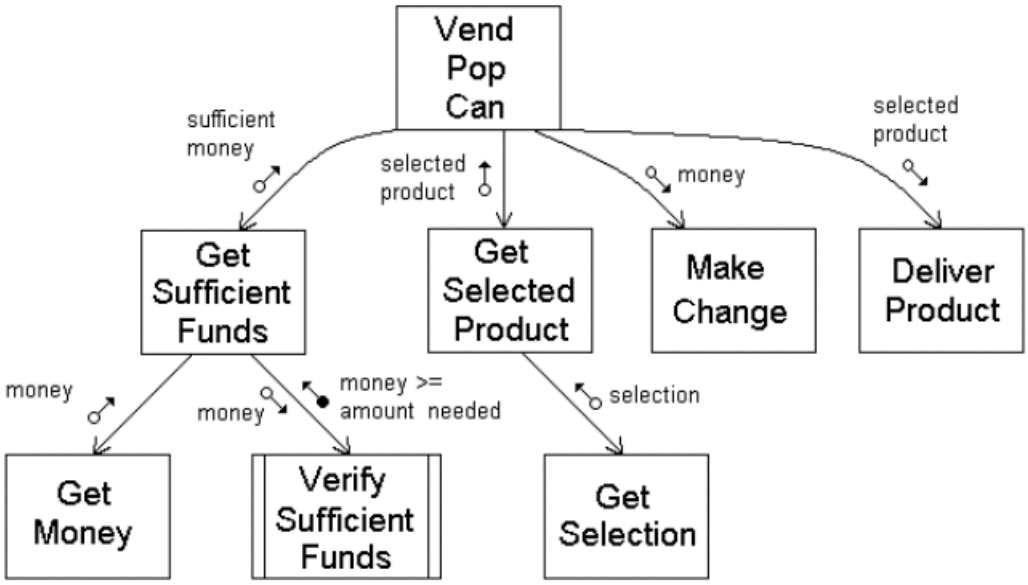
Ans.: Structure Chart : A hierarchical diagram showing the relationships between the modules of a computer program. A module is the basic component of a structure chart and is used to identify a function. Modules are relatively simple and independent components. Higher-level modules are "control" modules that control the flow of execution. Lower level modules are "worker bee" modules and contain the program logic to actually perform the functions.

The vertical lines connecting the modules indicate the calling structure from the high-level modules to the lower-level modules. The little arrows next to the lines show the data that is passed between modules and represent the inputs and outputs of each module. At the structure chart level, we are not concerned with what is happening inside the module yet. We only want to know that somehow it does the function indicated by its name using the input data and producing the output data. A program call is when one module invokes a lower-level module to perform a needed service or calculation. Program call: The transfer of control from a module to a subordinate module to perform a requested service. The arrows with the open circle, called data couples, represent data being passed into and out of the module. A data couple can be an individual data item (e.g., a flag or a customer account number) or a higher-level data structure (e.g., an array, record, or other data structure). The arrow with the darkened circle is a "flag." A flag is purely internal information that is used between modules to indicate some result. Data couples: The individual data items that are passed between modules in a program call.

A basic idea of structured programming is that each module only has to do a very specific function. The module at the very top of the tree is the "boss" module. Its functions will be to call the modules on the next tier, pass information to them, and receive information back. The function of each middle-level module is to control the processing of the modules below it. Each has control logic and any error-handling logic that is not handled by the lower-level module. The modules at the extremities, or the leaves, contain the actual algorithms to carry out the functions of the program.

Structure charts are developed to design a hierarchy of modules for a program. A structure chart is in the form of a tree with a root module and branches. A subtree is simply a branch that has been separated from the overall tree. When

the subtree is placed back in the larger tree, the root of the subtree becomes just another branch in the overall tree.



Q.4 What is a HIPO Chart? Explain.

Ans.: HIPO charts show relationships between modules. It describes the data input and output from the processes and defines the data flow. It provides a structure by which the functions of a system can be understood. It also provides a visual description of input to be used and output to be produced for each level of the diagram. It makes the transformation from input to output data visible.

There are two parts to a HIPO chart, a hierarchy chart and an IPO chart.

The **hierarchy chart** is useful for showing hierarchy of procedures within a program. Hierarchy charts are also called structure charts, top-down charts, or VTOC (Visual Table of Contents) charts. All these names refer to planning diagrams that are similar to a company's organization chart. Hierarchy charts depict the organization of a program but omit the specific processing logic. They describe what each part, or module, of the program does and how the modules relate to each other.

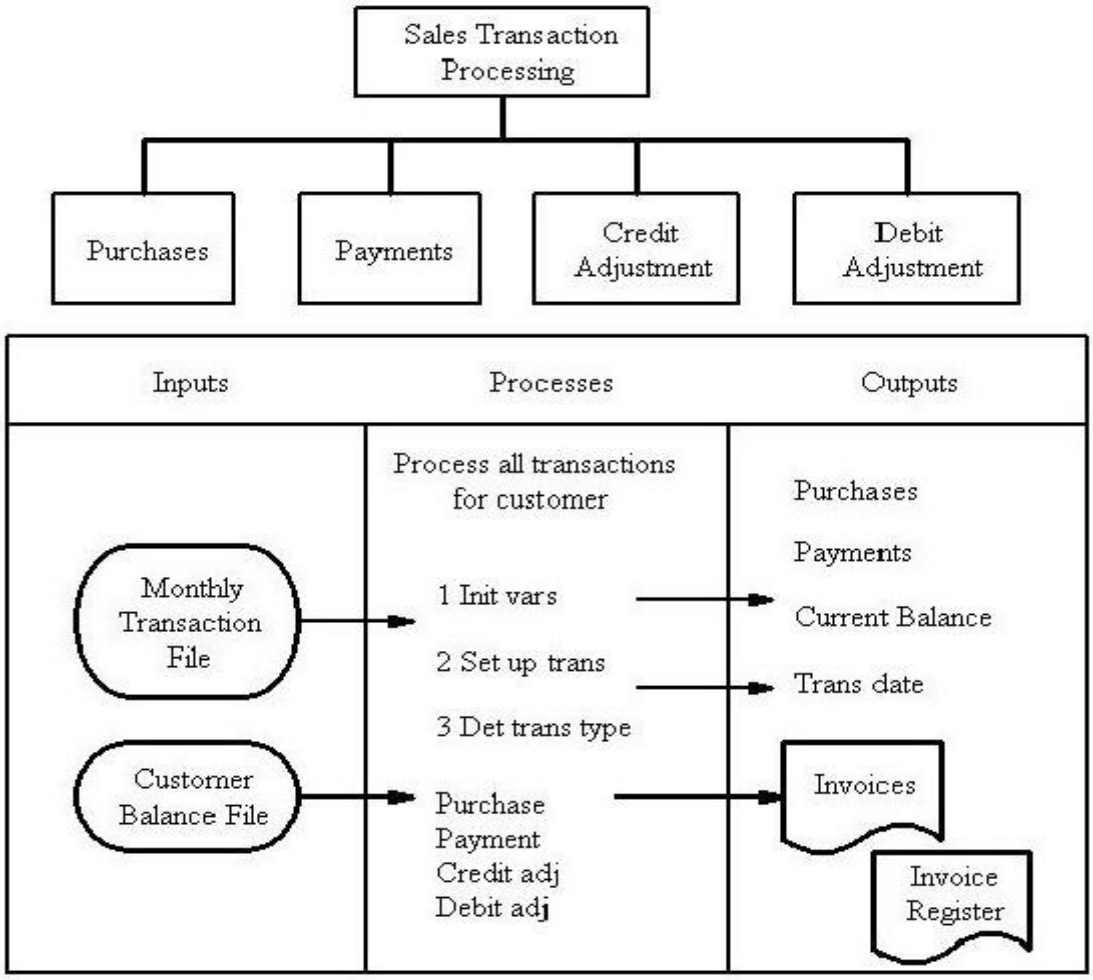
The **IPO** chart describes the system in terms of its inputs, outputs and the processes that are performed on the inputs to transform them into outputs. It provides the following :

(a) The Input section that contains the data items used by the process steps.

(b) The Output section that contains the data items created by the process steps.

(c) Process section that contains numbered steps that describe the functions to be performed. Arrows connect them to the output steps and the input/output data items.

The IPO chart is in the form of a table with three columns, one for each of Input, Output and Process. The flow between screens is indicated by the use of arrows.

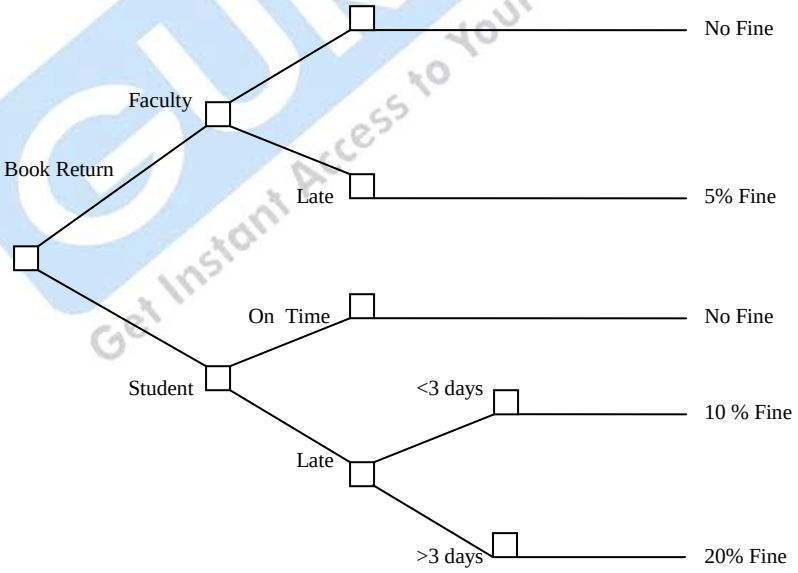


Q.4 How to draw a Decision Tree?

Ans.: You start a decision tree with a decision that needs to be made. This decision is represented by a small square towards the left of a large piece of paper. From this box draw out lines towards the right for each possible solution, and write that solution along the line. At the end of each solution line, consider the results. If the result of taking that decision is uncertain, draw a small circle. If the result is another decision that needs to be made, draw another square. **Squares represent decisions; circles represent uncertainty or random factors.** Write the decision or factor to be considered above the square or circle. If you have completed the solution at the end of the line, just leave it blank. Starting from the new decision squares on your diagram, draw out lines representing the options that could be taken. From the circles, draw out lines representing possible outcomes. Again mark a brief note on the line saying what it means. Keep on doing this until you have drawn down as many of the possible outcomes and decisions as you can see leading on from your original decision.

Example: Book return policy in library

If a Faculty returns a book late, a fine of 5% of the book rate is charged. If a Student returns a book late by 3 days, fine is 10%, else 20% of book rate.



Q.5 In context with an ER diagram explain Cardinality and Modality. Give example.

Ans.: Cardinality : The elements of data modeling – data objects, attributes and relationships provide information only about which objects are related to one another. But this information is not sufficient for software engineering purpose. Cardinality specifies how many instances or occurrences of object X are related to how many occurrences of object Y. Cardinality is usually expressed as 'one' or 'many'. Thus two objects can be related as

(1) **One-to-One (1:1) :** An occurrence of object A can relate to one and only one occurrence of object B and an occurrence of B can relate to only one occurrence of A.

(2) **One-to-Many (1:N) :** One occurrence of object A can relate to one or many occurrences of object B but an occurrence of B can relate to only one occurrence of A. E.g. mother can have many children, but a child can have only one mother.

(3) **Many-to-Many (M:N) :** An occurrence of object A can relate to one or many occurrences of object B and an occurrence of B can relate to only one or many occurrences of A. E.g. an uncle can have many nieces and a niece can have many uncles.

Cardinality defines the maximum number of objects that can participate in a relationship. It does not tell whether or not a data object must participate in the relationship.

Modality : If a particular relationship is optional or not needed then we say that the modality of that relationship is 0. The modality is 1 if an occurrence of the relationship is necessary.

Example : Consider 2 data objects Patient and Doctor. The relationship between the two data objects is *Treats.* A doctor needs a patient to treat, so the modality is 1 while it is not necessary for a patient to be treated by a doctor (he can be treated

with home remedies too). So here the modality is 0.

When we need to specify cardinality we use the symbols

- One = a line or dash |
- Many = crow's feet ←

To specify modality we use the symbols

- One = a line or dash |
- Zero = a circle o

The following ER diagram specifies cardinality and modality.

The symbols on the relationship line that is closest to the data object will denote cardinality and the next will denote modality.

Q.6 Explain Data Modeling and ER diagram with example.

Ans.: Data Modeling : It gives answers to questions regarding the data that is to be used in the application. We come to know the data objects, where they are stored, what is the relationship between objects, etc. Data modeling uses an Entity Relationship diagram to solve these questions. An Entity Relationship diagram will focus on all data that are entered, stored, transformed and produced within an application. The data model consists of three interrelated information – data objects, attributes that describe the data objects and relationships that connect data objects to one another.

Data Objects : A data object is something that has a number of different properties or attributes and that can be understood by software. For example a person or a car can be viewed as data objects. Data objects are related to one another. E.g. **person** can *own* **car**, where the relationship *own* denotes a

connection between **person** and **car**. A data object reflects only data and not the operation that can be done on that data.

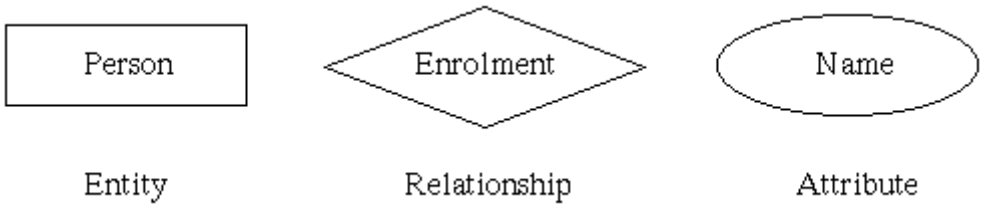
Attributes : Attributes define the properties of a data object. They can be used to name an instance of the data object, describe the instance or make reference to another instance in another table (e.g. attribute Owner). One or more attributes that uniquely identifies one and only one instance of an entity is defined as an identifier or primary key. E.g. employee no is a primary key for an employee.

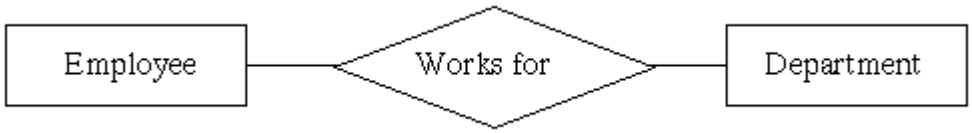
Relationships : Data objects are connected to one another in different ways. Consider two data objects – book and bookstore. A connection is established between book and bookstore because the two objects are related.

Entity – Relationship Diagrams : The object-relationship pair can be represented graphically using an ER diagram. An entity represents an object. Examples: a computer, an employee, a song, a mathematical theorem. Entities are represented as rectangles.

A relationship captures how two or more entities are related to one another. Examples: an *owns* relationship between a company and a computer, a *supervises* relationship between an employee and a department, a *performs* relationship between an artist and a song. Relationships are represented as diamonds, connected by lines to each of the entities in the relationship.

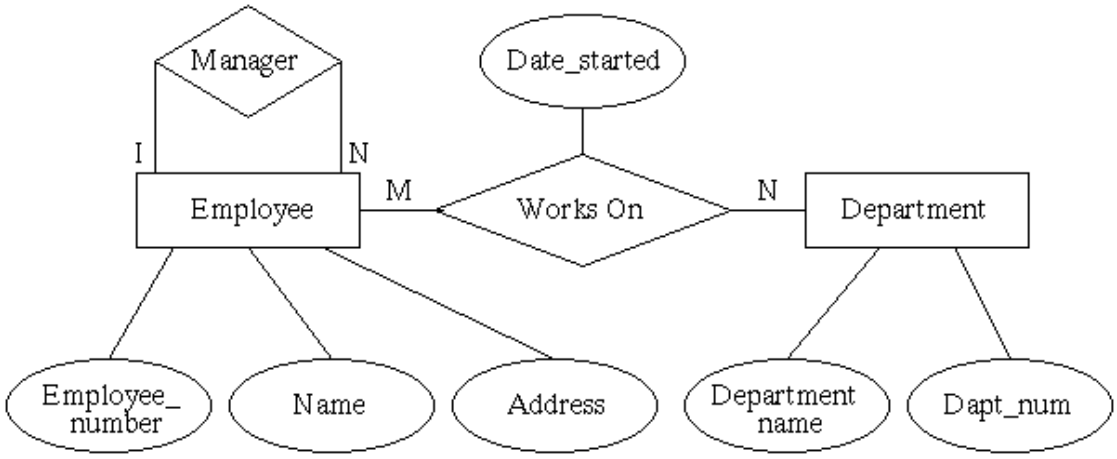
Entities and relationships can both have attributes. Examples: an employee entity might have an employee ID number attribute; the *proved* relationship may have a *date* attribute. Attributes are represented as ellipses connected to their entity by a line.





A Simple E-R Diagram

The following E-R diagram gives the attributes as well.



An E-R Diagram with Attributes

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Chapter-6

Feasibility Study

Feasibility study in the analysis phase is conducted to find the best candidates system out of the all alternative candidate system. Here we need to consider the economic, behavioral and technical feasibility in the system development. The project team is formed to develop system flowchart that identify the characteristics of system, evaluate the performance of each system, weigh the system performance and then finally select the best candidate system out of alternative systems.

Q.1 What is Feasibility? Describe the different types of Feasibility.

Ans.: Feasibility is the determination of whether or not a project is worth doing. The process followed in making this determination is called feasibility study. A feasibility study is carried out to select the best system that meets performance requirements. When conducting feasibility study, an analyst can consider 7 types of feasibility:

- **Technical Feasibility:** It is concerned with specifying the equipment and the computer system that will satisfy and support the proposed user requirements. Here we need to consider the configuration of the system which tells the analyst how many work stations are required, how the

units are interconnected so that they can operate and communicate smoothly.

- **Operation Feasibility:** It is related to human organizational aspects. The points to be considered here are – what changes will be brought with the system?, what new skills will be required?, do the existing staff members have these skills and can they be trained?
- **Economic Feasibility:** It is the most frequently used technique for evaluating a proposed system. It is also called Cost/Benefit Analysis. It is used to determine the benefits and savings that are expected from the proposed system and compare them with the costs. If benefits are more than the cost, the proposed system is given an OK.
- **Social Feasibility:** It is a determination of whether the proposed system will be acceptable to the people or not. It finds out the probability of the project being accepted by the group of people who are directly affected by the changed system.
- **Management Feasibility:** It is a determination of whether the proposed system is acceptable to the management of the organization. The project may be rejected, if the management does not accept the proposed system.
- **Legal Feasibility:** It is a determination of whether the proposed project is under legal obligation of known Acts, Statutes, etc.
- **Time Feasibility:** It is a determination of whether the project will be completed within a specified time period. If the project takes too much time, it is likely to be rejected.

Q.2 What are the steps in feasibility analysis?

Q.3 What is Cost/Benefit Analysis? Explain its procedure.

Ans.: The costs associated with the system are expenses or losses arising from developing and using a system. But the benefits are the advantages received from installing and using this system. Cost/Benefit analysis is a procedure that

gives a picture of the various costs, benefits and rules associated with a system. The determination of costs and benefits is done in the following steps:

(1) Identify the costs and benefits of a project.

(2) Categorize the costs and benefits for analysis: The different categories of costs and benefits are :
   (a) Tangible or Intangible
   (b) Direct or Indirect
   (c) Fixed or Variable

(3) Select a method of evaluation: When all data is identified and categorized, the analyst must select a method of evaluation. The methods are :
   (a) Net Benefit analysis
   (b) Present value analysis
   (c) Net Present value
   (d) Payback analysis
   (e) Break even analysis
   (f) Cash flow analysis

(4) Get the result of analysis and Take action.

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Unit-7

Input/output and Form Design

Introduction:

We define systems design as the process of developing specification for a candidate system that meet the criteria established in system analysis.
The Major step in a design is the preparation of input and the design of output reports in a form acceptable to the user.

Q.1 Explain Input Design.

Ans.: Inaccurate input data are the most common cause of errors in data processing. Errors entered by data entry operators can be controlled by input design. Input design is the process of converting user-originated inputs to a computer based format. In the system design phase, the expanded data flow diagram identifies logical data flows, data stores, sources and destinations. The goal of designing input data is to make data entry as easy, logical and free from errors as possible. In entering data, operators need to know the following:

(1) The allocated space for each field.

(2) Field sequence, which must match that in the source document.

(3) The format in which data fields are entered.

Source data are input into the system in a variety of ways, the media and devices used are Punch cards, Key-to-diskette, MICR, OCR, Optical bar code readers, CRT screens, etc. We also input data online. The three major approaches for entering data into the computer are menus, formatted forms and prompts. Menu is a selection list that simplifies computer data access or entry. Instead of remembering what to enter, the user chooses from a list of options and types the

option letter associated with it. A formatted form is a preprinted form or a template that requests the user to enter data in appropriate locations. It is a fill-in-the-blank type form. In prompt the system displays one inquiry at a time, asking the user for a response.

Q.2 Explain Output Design.

Ans.: Computer output is the most important and direct source of information to the user. Efficient, intelligible output design should improve the systems relationships with the user and help in decision making. A major form of output is a hard copy from the printer. Printouts should be designed around the output requirements of the user. The output devices to consider depend of factors such as compatibility of the device with the system, response time requirements, expected print quality and number of copies needed. The media devices used are MICR, Line, matrix and daisy wheel printers, Computer output microfilm, CRT screen, graph plotters and audio response. The output design considerations are as under :

(1) Give each output a specific name or title

(2) Provide a sample of the output layout, including areas where printing may appear and the location of each field

(3) State whether each output field is to include significant zeros, spaces, etc.

(4) Specify the procedure for proving the accuracy of output data.

In online applications, information is displayed oin the screen. The layout sheet for displayed output is similar to the layout chart used for designing input.

Q.3 Describe File Structure and Organization.

Ans.: Given that a file consists, generally speaking, of a collection of records, a key element in file management is the way in which the records themselves are organized inside the file, since this heavily affects system performances ad far as record finding and access. Note carefully that by ``organization'' we refer here to the *logical* arrangement of the records in the file (their ordering or, more generally, the presence of ``closeness'' relations between them based on their

content), and not instead to the physical layout of the file as stored on a storage media, To prevent confusion, the latter is referred to by the expression ``record blocking'', and will be treated later on.

Choosing a file organization is a design decision, hence it must be done having in mind the achievement of good performance with respect to the most likely usage of the file. The criteria usually considered important are :

(1) Fast access to single record or collection of related recors.

(2) Easy record adding/update/removal, without disrupting.

(3) Storage efficiency.

(4) Redundance as a warranty against data corruption.

Needless to say, these requirements are in contrast with each other for all but the most trivial situations, and it's the designer job to find a good compromise among them, yielding and adequate solution to the problem at hand. For example, easiness of adding. is not an issue when defining the data organization of a CD-ROM product, whereas fast access is, given the huge amount of data that this media can store. However, as it will become apparent shortly, fast access techniques are based on the use of additional information about the records, which in turn competes with the high volumes of data to be stored.

Sequential : This is the most common structure for large files that are typically processed in their entirety, and it's at the heart of the more complex schemes. In this scheme, all the records have the same size and the same field format, with the fields having fixed size as well. The records are sorted in the file according to the content of a field of a scalar type, called ``key''. The key must identify uniquely a records, hence different record have diferent keys. This organization is well suited for batch processing of the entire file, without adding or deleting items: this kind of operation can take advantage of the fixed size of records and file; moreover, this organization is easily stored both on disk and tape. The key ordering, along with the fixed record size, makes this organization amenable to dicotomic search. However, adding and deleting records to this kind of file is a tricky process: the logical sequence of records typically matches their physical layout on the media storage, so to ease file navigation, hence adding a record and maintaining the key order requires a reorganization of the whole file. The usual

solution is to make use of a ``log file'' (also called ``transaction file''), structured as a pile, to perform this kind of modification, and periodically perform a batch update on the master file.

Indexed Sequential : An index file can be used to effectively overcome the above mentioned problem, and to speed up the key search as well. The simplest indexing structure is the single-level one: a file whose records are pairs key-pointer, where the pointer is the position in the data file of the record with the given key. Only a subset of data records, evenly spaced along the data file, are indexed, so to mark intervals of data records.

A key search then proceeds as follows: the search key is compared with the index ones to find the highest index key preceding the search one, and a linear search is performed from the record the index key points onward, until the search key is matched or until the record pointed by the next index entry is reached. In spite of the double file access (index + data) needed by this kind of search, the decrease in access time with respect to a sequential file is significant. Consider, for example, the case of simple linear search on a file with 1,000 records. With the sequential organization, an average of 500 key comparisons are necessary (assuming uniformly distributed search key among the data ones). However, using and evenly spaced index with 100 entries, the number of comparisons is reduced to 50 in the index file plus 50 in the data file: a 5:1 reduction in the number of operations. This scheme can obviously be hierarchically extended: an index is a sequential file in itself, amenable to be indexed in turn by a second-level index, and so on, thus exploiting more and more the hierarchical decomposition of the searches to decrease the access time. Obviously, if the layering of indexes is pushed too far, a point is reached when the advantages of indexing are hampered by the increased storage costs, and by the index access times as well.

Case study

Partial source Document with check-off option

Recommended	Inefficient

Shirt size (check one)

Small ☐
Medium ☐
Large ☐
X large ☐

Shirts(enter size) ☐

Form to fill information

Assignment:

a.) What flaws are there in the form?
b.) Develop an updated version of the form.

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Unit-8
Documentation

Introduction:

Documentation is one of the systems which are used to communicate, instruct and Record the information for any reference of operational papoose.

Q.1 What is documentation and its importance?

Ans They are very useful for representing the formal flow of the present system. With the help of Documentation it is very easy to track the flow of the system's progress and they working of the system can be explained very easily.

It helps to provide the clear description of the work done so far. It is essential that the documents prepared must be updated on regular basis this will help to trace the progress of work easily. With appropriate and good documentation it is very easy to understand the how aspects of the system will work for the company where the system is to installed. It is also help to understand the type of data which will be inputted in the system and how the output can be produced.

After the system is installed, and if in case the system is not working properly it will be very easy for the administrator to understand the flow of data in the system with documentation which will help him/ her to correct the flaws and get the system working in no time.

Uses of Documentation

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- It facilitates effective communication regarding the system between the technical and the non technical users.
- It is very useful in training new users. With a Good documentation new users can easily get acquainted with the flow of the systems.
- Documentation also helps the users to solve problems like trouble shooting even a non technical user can fix the problems.
- It plays a significant role in evaluation process.
- It not only helps to exercise a better control over the internal working of the firm, but it also external as well especially during audit.
- Documentations can help the manager to take better financial decisions of the organization.

Q.2 Describe the different types of Documentation.

Ans.: There are five types of documentation:

(1) **Program:** Before a program is developed, the systems analyst should provide the programmer with the required documentation. The logic in some programs is best described by a flowchart. Sometimes decision tables are also useful. The main responsibility in documentation is to provide enough information to enable future programmers to understand and make necessary changes. Since programmers do not retain their jobs for a very long time, it becomes necessary that there be some kind of documentation that will be useful for the new programmers who are assigned the same system.

(2) **Operations:** For smooth running of the system, the data entry operator must have complete knowledge about the job. The instructions must be in a form that is easily accessible to the console operator and written in simple and understandable style.

(3) **User :** System users should have a manual that describes everything the users must know to do their job correctly. Users require two general type of information: complete details to handle everything the system processes, and an overall picture of the system.

(4) **Management :** The documentation required by management differs a lot from that required by users. The manual should enable management to perform three functions:

(a) Evaluate progress on the development of system.

(b) Monitor the existing systems.

(c) Understand the objectives and methods of the new and existing system.

(5) **Systems:** This manual document the complete life cycle of the system. If documents the results of the feasibility study, the team assigned, etc. It also documents the file specification, transaction specification and output specification.

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MCQs

Set 1:-

1. Which of the following technical skills is essential for a system analyst?
   (a) Knowledge of networking
   (b) Knowledge of operating system
   (c) Problem solving approach
   (d) None of the above ( )

2. Which one of the following is not a Top Management function?
   (a) Planning
   (b) Organizing
   (c) Decision making
   (d) Day to day operation ( )

3. An entity one of the following is not a Top Management functions?
   (a) All entities are so same type
   (b) May be of same type or may be of different type
   (c) Both a and b
   (d) Neither (a) nor (b) ( )

4. "SQL" stands for:
   (a) Software Quality Accuracy
   (b) Maybe same type or may be of different type
   (c) Both a and b
   (d) Neither a nor b ( )

5. A central repository of records is known as:
   (a) Data warehousing (b) Client server system
   (c) Data mining (d) Distributed System ( )

6. System Development Cycle is also known as:
   (a) Problem solving cycle (b) Product life cycle
   (c) Hardware cycle (d) Software cycle ( )

7. A computer which requests another computer is:

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(a) Server
(b) Multiplexer
(c) Client
(d) None of the above ( )

8. System testing is an important par of:
(a) Model building
(b) Quality assurance
(c) Generating information
(d) None of the above ( )

9. Risk analysis includes:
(a) Manpower risk
(b) Technology risk
(c) Customer/user risk
(d) Environment risk ( )

10. Deductive database and expert system are mainly used for:
(a) Replacing the functionality of a real expert
(b) Hypothesis testing
(c) Knowledge discovery
(d) All of the above ( )

11. Error and fraud in any computer system can be detected through:
(a) Usage of password
(b) Network security
(c) Audit trails
(d) None of the above ( )

12. Which is the characteristics of data in a DBMD?
(a) Consistency (b) Security
(c) Independence (d) All of the above ( )

13. Which tool is used for analysis of data flow:
(a) Data flow diagram (b) Data dictionary
(c) Flow chart (d) All of the above ( )

14. Storage of information in graphs video, voice is:
(a) Multimedia (b) Cookies
(c) Text file (d) All of the above ( )

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15. Decision tables is:
    (a) table containing decision
    (b) methods
    (c) none of the various programming analysis tools
    (d) debugging tool ( )

16. A distinct object in a system is known is:
    (a) Degree
    (b) Attribute
    (c) Parameter
    (d) Entity ( )

17. An unstructured tool for information gathering can be:
    (a) prototyping (b) questionnaires
    (c) observation (d) all of the above ( )

18. .....is the process of collecting organizing, storing and maintaining complete historical record of programs.
    (a) Documentation (b) Testing
    (c) Debugging (d) None of the above ( )

19. Cost benefit analysis is performed during be:
    (a) Analysis phase
    (b) Design phase
    (c) Implementation
    (d) None of the above ( )

20. In terms of total software cost, maintenance costs appear to constitute about:
    (a) 5%–20%
    (b) 20% – 40%
    (c) 40% – 80%
    (d) 80% – 90% ( )

21. CASE is stand for:
    (a) Computer Assisted Software Engineering
    (b) Computer and Software Engineering
    (c) Computer Aided Software Engineering
    (d) None of the above ( )

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22. Pseudo code is:
(a) Programmer (b) IBA
(c) User (d) System Analyst ( )

23. A system that groups a number of transaction for later processing is known is:
(a) Programmer
(b) IBA
(c) User
(d) System Analyst ( )

24. A person who analysis the way the system works and its problem is:
(a) Client server (b) On line system
(c) Real time system (d) Batch system ( )

25. Which of the following areas should be addressed while designing a system:
(a) Problem domain (b) Human interface
(c) Task management (d) Data management ( )

26. Top level manager uses:
(a) Strategic information
(b) Tactical information
(c) Operational information
(d) None of the above ( )

27. Entities, attributes and relationship are associated with:
(a) Logical concept of data
(b) Physical concept of data
(c) Person of organization
(d) None of the above ( )

28. Prototyping aims at:
(a) End user understanding and approval
(b) Program logic
(c) Planning of data flow organization
(d) None of the above ( )

29. File conversion is part of:
(a) System cut over
(b) System design
(c) Day to day activity

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(d) None of the above ( )

30. DSS role is:
(a) Trial and error search for solutions
(b) Planning
(c) Analyzing alternatives
(d) (a) (b) and (c) of the above ( )

31. Tangible benefits by their very nature, require:
(a) Subjective evaluation
(b) Quantifiable evaluation
(c) Feasible evolution
(d) None of the above ( )

32. The components that make up any system is known is:
(a) Data
(b) Boundary
(c) Description
(d) Information ( )

33. In a DBMS two records types and their relationship are called:
(a) Schema (b) Segment
(c) Set (d) Database record ( )

34. Data integrity stands for:
(a) Validated data
(b) Data stored in different files showing consistency
(c) Data field integrated to provide summary
(d) None of the above ( )

35. Hashing procedure is used in:
(a) Random files
(b) Sequential files
(c) Indexed relationship, field and record type
(d) None of the above ( )

36. A DDL is:
(a) Establishes relationship, field and record type
(b) Helps maintaining data in database
(c) Create database

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(d) None of the above ( )

37. Which of the following are tools of SASD?
(a) HIPO
(b) CASE
(c) DFD
(d) All of the above ( )

38. Which of the following is not part of SDLC?
(a) Audit
(b) Reliability
(c) Security
(d) None of the above ( )

39. .....means changing from one system to another:
(a) Manipulations
(b) Conversion
(c) Requirement
(d) Designing ( )

40. The full form of CPM is:
(a) Critical path method
(b) Critical program methodology
(c) Computer program and maintenance
(d) Complicated path method ( )

Answer Key

1. (c)	2. (d)	3. (a)	4. (c)	5. (a)	6. (b)	7. (c)	8. (b)	9. (b)	10. (d)
11. (c)	12. d)	13. (d)	14. (a)	15. (c)	16. (d)	17. (c)	18. (a)	19. (a)	20. (c)
21. (c)	22. (c)	23. (d)	24. (d)	25. (a)	26. (a)	27. (a)	28. (a)	29. (b)	30. (d)
31. (a)	32. (a)	33. (c)	34. (b)	35. (a)	36. (c)	37. (d)	38. (c)	39. (b)	40. (a)

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Set 2:-

1. Which of the following technical skills is essential for a system analyst?
   (a) Knowledge of networking
   (b) Knowledge of operating system
   (c) Problem solving approach
   (d) None of the above ( )

2. The first step in SDLC is:
   (a) Preliminary investigation and analysis
   (b) System design
   (c) Database Design
   (d) None of the above ( )

3. Which one of the following is not a Top Management function?
   (a) Planning
   (b) Organizing
   (c) Decision-making
   (d) Day to day operation ( )

4. Data dictionary keeps details of the content of:
   (a) Data Flow (b) Data stores
   (c) Both a and b (d) Neither a nor b ( )

5. Structured programming involves:
   (a) Functional modularization (b) Localization of error
   (c) Decentralized programming (d) All of the above ( )

6. Tangible benefits by their very nature, require:
   (a) Subjective evaluation (b) Quantifiable evaluation
   (c) Feasible evaluation (d) None of the above ( )

7. An entity set of ER-Diagram, is a set of entities.
   (a) All entities are of same type
   (b) May be of same type or may be of different type
   (c) Both a and b
   (d) Neither a nor b ( )

8. "SQA" stands for:
   (a) Software Quality Accuracy

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(b) Software Quality Assistant
(c) Software Quality Assurance
(d) None of the above ( )

9. A set of predefined steps for building a systems is :
(a) Linear cycle
(b) Water full cycle
(c) Both a and b
(d) None of the above ( )

10. The full form of CPM is:
(a) Critical path methods
(b) Critical program methodology
(c) Computer program and maintenance
(d) Complicated path method ( )

11. A central repository of records is known as:
(a) Data warehousing
(b) Client server system
(c) Data mining
(d) Distributed system ( )

12. System development cycle is also known as:
(a) Problem solving cycle (b) Product life cycle
(c) Hardware Cycle (d) Software cycle ( )

13. A method to illustrate how data flows in a system is known as:
(a) Data flow diagram (b) Pseudo-code
(c) Decision-support systems (d) None of the above ( )

14. A distinct object in a system is known as:
(a) Degree (b) Attribute
(c) Parameter (d) Entity ( )

15. A diagram that shows the inputs and outputs of a system is known as:
(a) Document flow diagram (b) context diagram
(c) Process diagram (d) None of the above ( )

16. A computer which requests another computer is:
(a) Server

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(b) Multiplexer
(c) Client
(d) None of the above ( )

17. A step in the development process is :
(a) Set (b) Subset
(c) Break (d) Phase ( )

18. System testing in an important part of:
(a) Model building (b) Quality assurance
(c) Generating information's (d) None of the above ( )

19. Adapting an object for use in an application is known is:
(a) conversation
(b) Data mining
(c) Collaboration
(d) Customization ( )

20. The detailed study of the present system is referred to as:
(a) System planning
(b) System analysis
(c) Feasibility study
(d) System design. ( )

21. Management is linked to information by:
(a) Decision (b) Data
(c) Both a and b (d) Neither a nor b ( )

22. Which of the following is a tactical decision?
(a) Diversification (b) Data
(c) Both a and b (d) Neither a nor b ( )

23. Waterfall model follows;
(a) systematic approach
(b) Sequential approach
(c) Both a and b
(d) None of the above ( )

24. When the customer wants quick delivery, which model is best suited?
(a) Prototype model (b) Waterfall model

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(c) DSDM (d) None of the above ( )

25. LOC stands for:
(a) Line of code (b) Label of code
(c) Both a and b (d) None of the above ( )

26. Tools used in requirements are:
(a) Prototypes
(b) Use case
(c) Data flow diagram
(d) Transition process diagram ( )

27. Which of the following is not an element in the physical DFD?
(a) Internal/External entity
(b) Data flows
(c) Processors
(d) Flowchart ( )

28. A DFD is:
(a) Mainly used at the system specification stage
(b) The primary output of the system specification stage
(c) The modern version of a flowchart
(d) None of the above ( )

29. A software design description document only includes;

(a) Data dictionary
(b) ER diagram
(c) DFD
(d) All of the above ( )

30. Same types of attribute is called:
(a) Attribute set (b) Domain
(c) Entity set (d) None of the above ( )

31. Once the software is installed and deployed it enters the:
(a) Implementation phase
(b) System design phase
(c) Maintenance
(d) None of the above ( )

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32. Risk analysis includes:
    (a) Manpower risk
    (b) Technology risk
    (c) Customer/user risk
    (d) Environment risk
    (e) All of the above ( )

33. Which set of properties that should be specified as a part of an architectural design?
    (a) Structured Properties (b) Extra-functional properties
    (c) Families of related systems (d) All of the above ( )

34. FTR stands for:
    (a) Formal Testing Review
    (b) Formal Technical Review
    (c) Formal Technical Relation
    (d) None of the above ( )

35. Validation testing includes:
    (a) Recovery testing
    (b) Stress testing
    (c) Alpha and Beta testing
    (d) Security testing ( )

36. System testing includes:
    (a) Recovery testing
    (b) Stress testing
    (c) Security testing
    (d) All of the nonve ( )

37. Project manager is responsible for:
    (a) Successful execution of the implementation phase
    (b) Accomplishing assigned tasks
    (c) Preparing soliciting document
    (d) None of the above ( )

38. Client-server database consists of:
    (a) Client application
    (b) Database server
    (c) Middleware

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(d) All of the above ( )

39. Which of the following is false?
(a) Data mining support massive data collection
(b) Data mining support powerful multiprocessor computer
(c) Data mining support, data mining algorithms
(d) None of the above ( )

40. Deductive database and expert systems are mainly used for:
(a) Replacing the functionality of a real expert
(b) Hypothesis testing
(c) Knowledge discovery
(d) All of the above ( )

Answer Key

1. (b)	2. (c)	3. (d)	4. (b)	5. (c)	6. (c	7. (c)	8. (c)	9. (c)	10. (b)
11. (a)	12. a)	13. (b)	14. (c)	15. (d)	16. (d)	17. (c)	18. (b)	19. (c)	20. (a)
21. (b)	22. (c)	23. (a)	24. (b)	25. (d)	26. (a)	27. (b)	28. (a)	29. (a)	30. (c)
31. (b)	32. (c)	33. (a)	34. (a)	35. (b)	36. (d)	37. (a)	38. (c)	39. (a)	40. (b)

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Set 3:-

1. Which is the system development approach?
   (a) Data modeling (b) Function oriented
   (c) Process modeling (d) None of these ( )

2. Which is the characteristic of data in a DBMS?
   (a) Consistency
   (b) Security
   (c) Independence
   (d) All of the above ( )

3. Error and fraud in any computer system can be detected through:
   (a) Usage of password (b) Network security
   (c) Audit trails (d) None of the above ( )

4. What is decision table?
   (a) A graphic method for describing the logic of decisions
   (b) Data dictionary
   (c) Flow chart
   (d) None of these ( )

5. Which tool is used for analysis of data flow?
   (a) Data flow diagram (b) Data dictionary
   (c) Flow chart (d) All of the above ( )

6. How many types of relationships can be defined between two or more entities.
   (a) 2 (b) 3
   (c) 1 (d) None of the above ( )

7. The characteristic of data in a database is:
   (a) Shared
   (b) Security
   (c) Persistence
   (d) All of the above ( )

8. The rectangular is used in DFD:
   (a) Read/write data
   (b) Processing

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(c) Decision-making
(d) None of these ( )

9. Which is a desirable feature of good quality design?
(a) Flexible
(b) Portable
(c) Secure
(d) All of the above ( )

10. Which tool is used for analysis of data flow?
(a) Data dictionary
(b) Structured English
(c) Decision Tables
(d) None of these ( )

11. A person who analyze the way the system works and its problems is:
(a) Programmer
(b) DBA
(c) User
(d) System analyst ( )

12. Storage of information in graphs, video, voice etc. is:
(a) Multimedia
(b) Cookies
(c) Text file
(d) None of the above ( )

13. The sequence of steps followed in a system study is :
(a) Problem definition, system design, system analysis, programming and implementation
(b) Problem definition, system analysis, programming and implementation
(c) System analysis, system design and system implementation
(d) Problem, definition, system analysis, system design, programming analysis, program preparation and implementation ( )

14. Decision table is:
(a) A table containing decisions
(b) A method to analyze how to get decision
(c) One of the various programming analysis tools
(d) A debugging tool ( )

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15. Decision tables are made prior to making a/an:
    (a) Flowchart (b) Algorithm
    (c) Program (d) Task analysis ( )

16. We task the help of flowcharts:
    (a) To decide the sequence of steps involved in finding the solution
    (b) As an addition to making algorithm
    (c) To prepare decision tables
    (d) None of the above ( )

17. A district object in a system is known is:
    (a) Degree (b) Attribute
    (c) Parameter (d) Entity ( )

18. A system that groups a number of transaction for later processing is known is:
    (a) Client Server (b) Batch system
    (c) Online system (d) Real time system ( )

19. Which of the following items are discussed during the system implementation phase of the application:
    (a) Program specification
    (b) Software specification
    (c) Software maintenance
    (d) All of the above ( )

20. A system flow chart describes the:
    (a) details of each program module
    (b) line diagram for particular program
    (c) data files and operations and decision for a particular program
    (d) sequence of operations techniques is used to simplify defining problem ( )

21. Which of the following techniques is used to simplify defining problems by both system analysis and programmers:
    (a) Documentation
    (b) Decision tables
    (c) Sub-routine
    (d) Decision instruction ( )

22. The normal starting point of any system design is to:

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(a) determine the input requirement
(b) determine the output requirement
(c) establish data entry procedures
(d) determine data entry requirement ( )

23. Which of the following is not true about distributed processing:
(a) They are modular
(b) They are more reliable
(c) Maintenance costs are high
(d) Response is slow ( )

24. Which of the following technical skills is essential for a system analyst:
(a) Knowledge of networking
(b) Knowledge of operating system
(c) Problem solving approach
(d) None of the above ( )

25. An unstructured tools for information gathering can be:
(a) prototyping
(b) questionnaires ( )

26. The components of a distributed system are connected by a :
(a) Multiplexer
(b) Communication controller
(c) Network
(d) Switcher ( )

27. Entities attributes and relationships are associated with:
(a) Logical concept of data
(b) Physical concept of data
(c) Person of an organization
(d) None of the above ( )

28. Prototype is:
(a) minimodel of the existing system
(b) minimodel of tthe proposed system
(c) working model of the existing system
(d) none of the above ( )

29. .....is a collection of computer based information that is critical to successful execution of enterprise initiatives.

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(a) data mining
(b) data warehouse
(c) both a and b
(d) None ( )

30. A/An.....is a set of components that work together to accomplish one or more common goals.
(a) System
(b) Flow chart
(c) Algorithm
(d) None ( )

31. The feasibility report consists of:
(a) General specification for the new system
(b) Economic analysis of costs and justification for expenditure
(c) Technical considerations
(d) All of the above ( )

32. A.....is a structured repository of data.
(a) Data flow diagram
(b) Data dictionary
(c) Structure chart
(d) None ( )

33. An association among entities is caused a :
(a) Attribute
(b) Relationship
(c) Redundancy
(d) None ( )

34. .....are a fundamental tool of a structured desing.
(a) Structure charts
(b) Data structure diagrams
(c) Case tools
(d) None of the above ( )

35. Which of the following appropriately explains the desirable characteristic of a good system design?

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(a) Modular approach
(c) Proper documentation
(a) Neither a nor b
(c) Both a and b ( )

36. Design specifications do not normally include:
(a) Output requirements
(b) Input and storage requirements
(c) Control Provisions
(d) Blueprints showing the layout hardware ( )

37. .....is a network that describes data flows and transformations throughout a system:
(a) Data flow diagram
(b) Data dictionary
(c) Structure charts
(d) None ( )

38. In development of an applications systems, which accesses data under a DBMS, the user vies the database as a:
(a) Group of files
(b) Logical Structure
(c) Random storage structure
(d) None of the above ( )

39. A set of prerecorded instructions executed by a computer is called the:
(a) Action
(b) Hardware
(c) Program
(d) None of these ( )

40. .....is the process of collecting, organizing, storing and maintaining a complete historical record of programs.
(a) Documentation
(b) Testing
(c) Debugging
(d) None of these ( )

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Answer Key

1. (b)	2. (d)	3. (c)	4. (c)	5. (a)	6. (b)	7. (d)	8. (d)	9. (b)	10. (b)
11. (d)	12. (a)	13. (a)	14. (c)	15. (b)	16. (b)	17. (c)	18. (a)	19. (c)	20. (d)
21. (b)	22. (d)	23. (a)	24. (a)	25. (a)	26. (c)	27. (d)	28. (c)	29. (b)	30. (c)
31. (d)	32. (a)	33. (a)	34. (b)	35. (b)	36. (a)	37. (c)	38. (c)	39. (b)	40. (a)

Set 4:-

1. The basic objective of system analysis is to:
   (a) Understand computer hardware by opening the system unit
   (b) Train manager in mathematical analysis
   (c) Run simulation program
   (d) Understand a current system and modify it in same way ( )

2. A zero level! DFD describes:
   (a) Overview of processes, inputs and outputs
   (b) Fully blown by system design
   (c) The system design can not be spilt further
   (d) None of these ( )

3. Which of the following is not part of the SDLC?
   (a) Feasibility study
   (b) System design
   (c) Unit testing
   (d) None of these ( )

4. Cost-benefit analysis is performed during the:
   (a) Analysis phase
   (b) Design phase
   (c) Implementation phase

(d) None of these ( )

5. Which of the following is most likely to be used to describe conditional logic?
   (a) Decision table
   (b) Data flow diagram
   (c) Structured English
   (d) All of the above ( )

6. Which of the following technical skills are essential for a system analyst?
   (a) Knowledge of networking
   (b) Knowledge of operating system
   (c) Problem solving approach
   (d) None of these ( )

7. The entity-relationship diagram:
   (a) Depicts how data is transformed as it moves through the system
   (b) Depicts relationship between data object
   (c) Describes how the system behaves as a consequences of external events
   (d) None of these ( )

8. The data dictionary consists of:
   (a) Definition of all data elements in data flow diagram
   (b) Process Specifications
   (c) Key field of the database
   (d) None of these ( )

9. The system design:
   (a) Documents the user requirement
   (b) Defines the architecture of the system
   (c) Is carried out before the systems design
   (d) None the these ( )

10. In terms of total software cost, maintenance costs appear to constitute about:
   (a) 5% – 20%
   (b) 20% – 40%
   (c) 40% – 80%
   (d) 80% – 90% ( )

11. Risk analysis is a part of which software development process:
   (a) Waterfall model

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(b) Prototype model
(c) Spiral model
(d) None of these ( )

12. In which phase of SDLC, the modules are tested against specification produced during design for the module?
(a) Analysis phase
(b) Design phase
(c) Coding Phase
(d) None of these ( )

13. How many types of relationship can be defined between two or more entities?
(a) 2 (b) 3
(c) 1 (d) None of these ( )

14. An unstructured tool for information gathering can be:
(a) Prototyping
(b) Questionnaires
(c) Observation
(d) All of these ( )

15. A knowledge is being discovered from a large volume of data, the method used is known is:
(a) Data warehousing (b) Data mining
(c) Data counting (d) None of these ( )

16. The type of organization, in which a single index for each key type exists and records are not necessarily stored in particular sequence:
(a) Index sequential method
(b) Inverted list organization
(c) Chaining
(d) None of these ( )

17. Loss of data integrity implies that data is:
(a) Inconsistent (b) Repeated
(c) Outdated (d) None of these ( )

18. A CASE is:
(a) Computer assisted software engineering
(b) Computer and software engineering

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(c) Prepare, connect, execute, fetchrow, finish, disconnect
(d) None of these ( )

19. A support system that is related to the higher level of management is:
(a) Data support system
(b) Digital support system
(c) Decision support system
(d) None of these ( )

20. The main advantage of normalized relations in relations DBMS is taht they:
(a) Are highly secure
(b) De not suffer from anomalies during deleted and update operations
(c) Occupy minimal storage
(d) All of the above ( )

21. A diagram that shows the input of output of a system is known as:
(a) Document flow diagram
(b) Process diagram
(c) Context diagram
(d) None of these ( )

22. Which of the following are tools of SASD?
(a) HIPO
(b) Case
(c) DFD
(d) All of the these ( )

23. Which of the following appropriately explains the desirable characteristic of a good system design?
(a) Modular approach
(b) Proper documentation
(c) Neither a nor b
(d) both a and b ( )

24. A typical data processing context, where master files are updated to produce desired output, is known is:
(a) Validation checking
(b) Transaction processing
(c) Normalization process
(d) None of these ( )

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25. Whether a proposed system can provide right information for the organizations personnel, falls under the study of:
    (a) Economic feasibility
    (b) Operational feasibility
    (c) Technical feasibility
    (d) All of these ( )

26. Stub is met within the context of:
    (a) Data communication
    (b) Testing of module
    (c) Random access
    (d) None of these ( )

27. Entities, attributes and relationship are associated with:
    (a) Logical concept of data
    (b) Physical concept of data
    (c) Persons of an organization
    (d) None of these ( )

28. Decision tables link conditions and:
    (a) Tables
    (b) Programs
    (c) Actions
    (d) None of these ( )

29. Pseudo code is:
    (a) False logic
    (b) Programming aid
    (c) Both a and b
    (d) Neither a nor b ( )

30. Design specification do not normally include:
    (a) Output requirements
    (b) Input and storage requirements
    (c) Control provisions
    (d) Blueprints showing the layout of hardware ( )

31. The sequence of steps of following in a system study is:

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(a) Problem definition, system design, system analysis, programming and implementing
(b) Problem definition, system design, system analysis, programming and implementing
(c) System analysis system design and system implementation
(d) Problem definition, system analysis, system design, programming and implementing ( )

32. The phase of system development associated with creation of test data is:
(a) System analysis
(b) Physical design
(c) System acceptance
(d) Logical design ( )

33. Prototype is a :
(a) Minimodel of the existing system
(b) Minimodel of the proposed system
(c) Working model of the existing system
(d) None of these ( )

34. In development of an application system, which accesses data under a DBMS, the user views the database as a:
(a) Group of files
(b) Logical structure
(c) Random storage structure
(d) None of these ( )

35. A distinct object in a system in known is:
(a) Degree
(b) Attribute
(c) Parameter
(d) Entity ( )

36. A person who analysis the way the system works and its problem is:
(a) Programmer
(b) DBA
(c) User
(d) System analyst ( )

37. A system that groups a number of transaction for later processing is known is:

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(a) Client Server
(b) Post on Point
(c) Post Office Protocol
(d) Post of Protocol ( )

38. .....is an application layer protocol that establishes, maintains and terminates a multimedia session.
(a) SIP
(b) RTCP
(c) DCT
(d) JPEG ( )

39. <Frameset Cols = "33%, 33%, 33%">
(a) Divides the browser screen into three equal horizontal sections
(b) Divides the browser screen into three equal vertical section
(c) Divides the browser screen into three horizontal sections
(d) Divides the browser screen into three vertical section ( )

40. A.....can forward or block packets based on the information in the network layer and transport layer headers.
(a) Proxy farewell (b) Packet-filter fire well
(c) Message Digest (d) Private Key ( )

Answer Key

1. (c)	2. (b)	3. (b)	4. (d)	5. (d)	6. (d)	7. (b)	8. (c)	9. (b)	10. (a)
11. (b)	12. (d)	13. (d)	14. (d)	15. (b)	16. (b)	17. (b)	18. (d)	19. (c)	20. (a)
21. (b)	22. (b)	23. (a)	24. (a)	25. (c)	26. (c)	27. (a)	28. (d)	29. (a)	30. (a)
31. (d)	32. (a)	33. (c)	34. (b)	35. (d)	36. (c)	37. (c)	38. (b)	39. (d)	40. (b)

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Set 5:-

1. Which of the following is supported in Java?
   (a) Operator overloading
   (b) Pointers
   (c) Multiples Inheritance
   (d) Conditional Operator ( )

2. Which of the following is not a characteristic of HTTP?
   (a) Stateless protocol
   (b) Connection oriented
   (c) Object-oriented protocol
   (d) None of the above ( )

3. HTTP is a .....layer protocol:
   (a) Network
   (b) Transport
   (c) Application
   (d) Presentation ( )

4. A periodic signal completes one cycle in 0.001 seconds. What is the frequency?
   (a) Get
   (b) Post
   (c) Find
   (d) Put ( )

5. Which of the following is true with respect to cookies?
   (a) They allow Microsoft to look at your hard driver
   (b) They taste yummy and best served with milk
   (c) They serve as the virtual machine to run Java applets
   (d) They allow server programs to store and retrieve info on the client side ( )

6. Dynamic HTML can:
   (a) Create a ticker that automatically refreshes its content
   (b) Create 3 - D Elements which can overlap
   (c) Animate text and images without an animated gif file
   (d) All of the above ( )

7. Which of the following is not internet security requirement?

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(a) Protecting confidentiality of private information
(b) Preventing unauthorized modification information
(c) Counting the number of customers accessing the internet
(d) Presenting the availability of system resources ( )

8. When a person uses a regular modem to make a connection to an internet service provider through POTS, the data travels over a:
(a) Dedicated circuit
(b) Dialed circuit
(c) ISDN circuit
(d) VPN circuit ( )

9. Mobile nodes are assigned:
(a) Three IP addresses
(b) Two IP address
(c) One IP address
(d) None of the above ( )

10. Which of the following is not an attribute of the <TR> tag?
(a) ALIGN (b) STYLE
(c) CHR (d) VALIGN ( )

11. Consider the following sets A and B:
AISMTP, HTTP, FTP, TELNET, NNTP, UUCP
B {Remote login, News groups, Webpages, Email, File upload}
Which of the following illustrate the best combinations of an elements of a with an element of B?
(a) {SMTP-News group, HTTP-Web Pages, FTP-Email TELNET. File uplaod, NNTP-Remote Logn}
(b) {SMTP-WebPages, HTTP-Newsgroups, FTP-File upload, TELNET- Remote login}
(c) SMTP-Email, HTTP-WebPages, TP-File upload, TELNET-Remote login, NNTP-Newsgroups}
(d) {SMTP-Email, HTTP,File upload, FTP-Newsgroups, TELNET-Remote login}
( )

12. Consider the following JavaScript code line document write (7/2) identify the correct statement (s) from among the following statement:
(a) The output is 7/2
(b) The output is 3

(c) This output is 3.5
(d) The java script code produces an error message ( )

13. Which of the following is a correct statement?
(a) JavaScript is a strongly typed language
(b) DOM stands for document object model
(c) The java script function prompt ( ) can be used to display a confirmation dialog box ( )
(d) The java script exist statement can be used in return a result from a function.

14. In HTML, which pair of tags is used to define a table row and table cell respectively?
(a) TH, TR
(b) TD, TR
(c) TR, TH
(d) TR, TD ( )

15. http://www.google.com/images/logo.gif is a URL, Then
(a) http://www.google.com/images/is the pathname where the file logo.gif is stored
(b) google.com is the internet domain name of the server where the file logo.gif is stored
(c) www.google.com is the internet domain name of the server where the file logo.gif is stored
(d) The above URL is a relative URL ( )

16. MIME stands for:
(a) Multipurpose Internet Mail Extension
(b) Multipurpose Internet Management Extension
(c) Multipurpose Internet Media Extension
(d) Multipurpose Internet Multimedia Extension ( )

17. Which of the following environment variable must be used by a CGI script in order to produce a browser dependent output?
(a) HTTP_ACCEPT
(b) HTTP_USERAGENT
(c) REQUEST_METHOD
(d) HTTP_FROM ( )

18. Which of the following represent images, sound and vidio files respectively?
(a) Myfile.mid, myfie,avi,myfile,gif
(b) Myfile.gif,myfile,mid,myfile.avi

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(c) Myfile.gif,myfile.png,myfile.avi
(d) Myfile.avi,myfile,gif.myfile.mid ( )

19. A linked page opens is new window when target property of anchor tag is set to:
(a) _blank
(b) _parent
(c) _child
(d) _mainframe ( )

20. Select the odd one:
(a) <font>
(b) FTP
(c) <title>
(d) <> ( )

21. <Frameset Rows="33%, 33%, 33%>
(a) Divides the browser screen into three equal horizontal sections
(b) Divides the browser screen into three equal vertical sections
(c) Divides the browser screen into three horizontal sections
(d) Divides the browser screen into three vertical sections ( )

22. Which of the following is not Internet Related?
(a) POP3
(b) FTP
(c) x-400
(d) HTML ( )

23. Which of the following is a web-server?
(a) Microsoft IE
(b) Netscape Navigator
(c) Opera
(d) IIS ( )

24. <Form> tag's.....attribute specifies the CGI Script to which the data should be submitted:
(a) Post
(b) Action
(c) methods
(d) get ( )

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25. Which protocol cannot be used on the internet?
(a) IPX
(b) DNS
(c) POP3
(d) TCP ( )

26. What is the term for two modems establishing communication with each other?
(a) Interconnecting (b)Connecting
(c) Pinging (d)Handshaking ( )

27. Which of the following factors does impact the amount of bandwidth customer require to access the Internet over DSL?
(a) Type of application
(b) Length of user session
(c) Use of e-mail
(d) Necessity of web server to promote business information ( )

28. In JPEG image format, compression ratio of upto-can be achieved without losing image quality:
(a) 80 : 1
(b) 60 : 1
(c) 40 : 1
(d) 20 :1 ( )

29. Which of the following statement is not true?
(a) Analog modems are inexpensive
(b) ISDN difficult to install
(c) Leased lines are expensive
(d) Analog modems offer high speed access ( )

30. Which of the following is not a Traditional internet access method?
(a) Analog dial up modems
(b) ISDN
(c) Leased Lines
(d) DSL ( )

31. Which of the following domain names would most likely use a country domain to resolve its IP address?
(a) chal.at ae.fhda.edu (b) gsfe.nasa.gov
(c) kenz.acct.sony.in (d) mae.eng.sony.com ( )

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32. Which of the following is an address revolver in an internet?
    (a) DNS client
    (b) DNS Server
    (c) Host Machine
    (d) Root Server ( )

33. MPEG divides frames into three categories:
    (a) I-Frames, frames, B-Frames
    (b) I-Frames, A-Frames, B-Frames
    (c) I-Frames, U-Frames, B-Frames
    (d) I-Frames, T-frames, B-Frames ( )

34. Which of the following protocol is used to serve steaming audio/video?
    (a) SMTP
    (b) HHTP
    (c) FTP
    (d) RTSP ( )

35. JPEG encoding involves .....a process that reveals the redundancies in a block.
    (a) Blocking (b) The DCT
    (c) Quantization (d) Vectorization ( )

36. A client machine usually need.....to sent email:
    (a) Only SMTP
    (b) Only POP
    (c) Both SMTP and POP
    (d) None of the above ( )

37. Protocols for internet Telephony are:
    (a) SIP and H.323 (b) RSTP and SRTF
    (c) RSTP and RTCP (d) None of the above ( )

38. .....is a device at the telephone company site that can packetize data to be sent to the ISP server.
    (a) A SDLAM (b) An ADSL Modem
    (c) A filter (d) A splitter ( )

39. A paired HTML tag ends with:
    (a) <\tag_name> (b) </tag_name>

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(c) <tag_name> (d) <tag_name/> ( )

40. An applet is:
(a) A stand alone java program
(b) An animation tool
(c) A java program run able only in a browser
(d) A server ( )

Answer Key

1. (d)	2. (c)	3. (c)	4. (b)	5. (d)	6. (d)	7. (c)	8. (a)	9. (b)	10. (c)
11. (c)	12. (c)	13. (b)	14. (d)	15. (a)	16. (a)	17. (b)	18. (b)	19. (a)	20.(b)
21. (a)	22. (c)	23. (d)	24. (c)	25. (b)	26. (d)	27. (c)	28. (d)	29. (d)	30. (a)
31. (c)	32. (b)	33. (a)	34. (d)	35. (c)	36. (a)	37. (a)	38. (b)	39. (b)	40. (c)

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Glossary

Activity That set of tasks which are organized and broken down into a set of procedures to accomplish a specific goal. The distinction between a sub-function and an activity is as much a matter of interpretation as it is a matter of scope.

Analysis The separation of an intellectual or substantial whole into its constituent parts for individual study. The stated findings of such a separation or determination.

Application The specific set of activities under analysis. An application may consist of one or more activities within a functional area, or it may include all activities within a functional area. In some cases the application may cross functional areas. In some firms an application is synonymous with a system.

Attribute An aspect, quality, or characteristic of either an entity or a relationship which describes it. An attribute may be a physical characteristic, such as size, weight, or color, or a locational attribute, such as place of residence or place of birth. It may be a quality such as level of a particular skill, educational degree achieved, or the dollar value of the items represented by the order.

Baseline An item or collection of items of a particular shape and form used as a reference. A baseline configuration is a reference point for evaluating modifications and enhancements and a starting point for making those changes. This baseline is normally considered the "official" version of an installed and operational Configuration Item.

Class A set, group, collection or configuration containing members having or believed to have at least one attribute or characteristic in common. To classify is to organize or arrange according to class or category.

Client/Server That combination of common use, sharable machines which provide a variety of services to a network of personal workstations know as clients. Server machines may be dedicated to providing file storage or peripheral device management

(such as printers, scanners, etc.) services, or they may also function as personal workstations.

Computer Aided Software Engineering (CASE) also called Computer Aided Systems Engineering, Computer Assisted Software Engineering and Computer Assisted Systems Engineering. CASE products are collections of software tools assembled by a vendor to help the analyst, designer and developer to produce diagrams and models; analyze component relationships; produce code; manage component and model versions; produce reports; and to document the results of their analysis and design in narrative form.

Configuration A specific arrangement of items assembled for a particular purpose.

Data analysis That process by which the data requirements of a functional area are identified, element by element. Each data element is defined from a business sense, its ownership is identified, and users and sources of that data are identified. These data elements are grouped into records, and a data structure is created which indicates the data dependencies.

Data dictionary An automated tool for collecting and organizing the detailed information about system components. Data dictionaries maintain facilities to document data elements, records, programs, systems, files, users, and other system components. A dictionary will also have facilities to cross-reference all system components to each other.

Data element The lowest unit of meaningful information in an automated file or on a document. A data element may consist of numbers, letters, or a combination of both.

Encyclopedia An integral part of a CASE product and designed by the CASE tool vendor specifically to collect and organize the detailed information about the data and process model system components developed using the CASE tool components. CASE encyclopedias maintain facilities to document attributes, entities and relationships, functions and processes, screens and reports, data flows, data stores, missions, goals, objectives, critical success factors, users and organization structures, and other data and process model components. An encyclopedia will also have facilities to cross-reference all components of its data and process models. A specific vendor's encyclopedia cannot normally operate independently of its associated CASE tool.

Entity Any real person, place, or thing, or logical person, place, or thing which can be definitively described, and which is of immediate and/or ongoing interest to the firm as a whole or to some aspect of the firm. An entity may also be an idea, concept, or convenience.

Entity set All known or suspected variants of the singular entities which make up the global set. In the entity-relationship model, the entity set is treated as if it were synonymous with the individual entities which comprise it. That is, the set is treated as if each of its component entities is defined and behaves in a similar manner.

Facilities Management. The process whereby one firm (the contracting firm) enters into a fixed length contract with another (the contractor) where the contractor agrees to operate and maintain the contracting firm's information systems. The Contracting firm normally agrees to provide all or a specified part of the necessary Information Systems equipment and supplies, and the contractor provides its own employees and management. The contractor operates the contracting firm's equipment, on the contracting firm's premises. Some or all of the contractor's employees may be located on the contracting firm's premises.

File A group of records, in automated or document form, which relate to the same subject and which are used and manipulated in the same manner.

Function A series of related activities, involving one or more entities, performed for the direct or indirect purpose of fulfilling one or more missions or objectives of the firm, generating revenue for the firm, servicing the customers of the firm, producing the products and services of the firm, or managing, administering, monitoring, recording, or reporting on the activities, states, or conditions of the entities of the firm.

Graphic User Interface (GUI) The term given to that set of items and facilities which provide the user with a graphic means for manipulating screen data rather than being limited to character based commands. Graphic User Interface tool kits are provided by many different vendors and contain a variety of components including (but are not limited to) tools for creating and manipulating Windows, Menu Bars, Status Bars, Dialogue Boxes, Pop-Up Windows, Scroll Or Slide Bars, Icons, "Radio" Buttons, On-Line and Context Dependent Help Facilities. Graphic User Interface tool kits may also provide facilities for using a mouse to locate and manipulate on screen data and activate program components.

Integrated CASE (I-CASE) A collection of products designed to allow the tools contained within them to communicate with each other and to transfer analysis, design and development data between them. Thus the data modeling tool may share data with the process modeling tool and both will share data with the code generation tools. the measurement tools may collect data from both and both may support the testing tools. Rarely however, will one CASE product permit and facilitate the transfer of data from its storage facility to that of another CASE product. Thus once a design is begin in one CASE too it is difficult or in some cases impossible to transfer that design information to another CASE product with completely reentering all the information

Interview A formal face-to-face meeting, especially, one arranged for the assessment of the qualifications of an applicant, as for employment or admission.... A conversation, as one conducted by a reporter, in which facts, or statements are elicited from another.

Life cycle The course of developmental changes thorough which a project passes from its inception as a project request to the mature state as characterized by a stable production environment.. A progression through a series of differing stages of development.

Method A means or manner of procedure, a regular and systematic way of accomplishing something. An orderly and systematic arrangement. Procedures according to a detailed, logically ordered plan.

Methodology The system of principles, practices, and procedures applied to a specific branch of knowledge.

Metric - A standard of measurement. The term is most often used to identify things that will be measured rather than the measurement process or the individual readings or points. Some examples of metric might be: lines of code, number of phone calls, number of resignations, or number of tests.

Model A representation, either graphic, narrative, or a combination of both, of a physical or conceptual environment. A model must identify the major components of the environment, describe those components in terms of their major attributes, and depict the relationships between the components and the conditions under which the components exist and interact with each other.

Outsourcing. The process whereby one firm (the contracting firm) enters into a fixed length contract with another (the contractor) where the contractor agrees to operate and maintain the contracting firm's information systems. The Contractor firm agrees to buy all or a specified part of the contracting firms Information Systems equipment and supplies, and to hire as their own employees all or a specified part of the contracting firm's Information Systems employees.

Personal Computer (PC) - Any combination of processor, input device and output device designed for use by a single individual. Personal computers may also be called workstations. Personal computers may have a character orientation, a graphical orientation, may be connected to other personal computers, or may operate in a standaloness mode, and may or may not have connectivity to a mainframe. Personal computer software is normally characterized by an operating system which provides basic file access, management and display services and well as application scheduling and management.

Plan That sequence of activities which are to be followed. A plan states each task, the estimated time to complete it, the persons assigned to perform it, and any task-to-task dependencies. Plans are updated on a periodic basis with actual results, and new estimates are determined. At any point, the plan should reflect actual progress and remaining work.

Platform The term used to distinguish between the different classes or sizes of computing machinery –mainframe, minicomputer and microcomputer (or personal computer or workstation), between the various operating systems on each machine, and in some cases between stand-alone machines and networked machines. In some cases the term platform is used to distinguish between one combination of machine and software and some other combination.

Procedure The specific steps which must be followed in order to accomplish a specific task or activity.

Process A sequence of related activities, or it may be a sequence of related tasks which make up an activity. These activities or tasks are usually interdependent, and there is a well-defined flow from one activity to another or from one task to another.

Program A sequence of instructions which may be followed by a computer to perform a specific task or tasks.

Prototype A model on which later stages or development is based or judged. Prototypes are usually primitive forms used to evaluate a design. Prototypes may or may not actually work.

Record A group of one or more data elements which are stored together and which represent information which relates to a common topic. A record may be automated, or it may be a business document.

Relationship An association, linkage, or connection, either real or suspected, between entities of the same or different set which describes their interaction, the dependence of one upon the other, or their mutual interdependence.

Repository A tool independent of both DBMS and CASE products designed to collect and organize all analysis and design information regardless of source. Repositories can collect information about the components of the data and process model components developed using the CASE tools, as well as that information collected about non-model Information systems components such as data elements, records, programs, systems, files, and users. Repositories maintain facilities to document attributes, entities and relationships, functions and processes, screens and reports, data flows, data stores, missions, goals, objectives, critical success factors, users and organization structures, and other data and process model components.

Review A reexamination or reconsideration.. A retrospective view or survey. An inspection or examination with the intention of evaluating and correcting flaws or errors

Security The protection of the firm's records and resources from unauthorized access, modification, or other interference includes an analysis of ownership, access, modification, use, and a determination of what protective or restrictive measures must be taken to ensure adequate protection of the firm's files.

Standards The rules which must be followed in order to accomplish a specific activity or task. Standards are established to ensure that all work is performed in a uniform manner.

System A group of interacting, interrelated, or interdependent (business functions, processes, activities or) elements forming a complex whole .... a functionally related

group of (business functions, processes, activities or) elements, for instance, a network of structures and channels, as for communications, travel, or distribution.

Systems analyst One who engages in the study of, and separation of, a group of interacting, interrelated, or interdependent (business functions, processes, activities or) elements forming a complex whole into its constituent parts for individual study.

Task The lowest unit of discrete work which can be identified. An activity may be composed of many tasks. Tasks are highly repetitive, highly formalized, and rigidly defined.

Users Business personnel in other areas of the firm who manage, supervise, or perform the direct and indirect operational, managerial, and administrative tasks of the firm. Users provide the impetus for the development of these systems, in many cases they fund the development and implementation process and provide for their ongoing operation, and in all cases they supply the policies, guidelines, business requirements, specifications, and background information about the particular area to be systematized and automated.

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Syllabus

MCA Year 2 Semester III

System Analysis and Design

Unit I: System Concepts and Information Systems Environment: The System Concept: Definition, Characteristics of Systems, Elements of a System, Open and Closed System, Formal and Informal Information Systems, Computer based Information Systems, Management Information System, Decision Support System, General Business Knowledge, and Interpersonal Communicational System.

Unit II : System Development Life Cycle: Recognition of needs, Impetus for System Change, Feasibility Study, Analysis, Design, Implementation, Post implementation and Maintenance. Role of the Systems Analyst, The Analyst/User Interface, Behavioral issues.

Unit III: Systems Planning and Initial Investigation: Strategies for Determining Information

Requirement, Problem Definition & Project initiation, Background Analysis, Fact Analysis, Review of Written Documents, Onsite Observations, Interviews and Questionnaires, Fact Analysis, Performance Analysis, Efficiency Analysis, Service Analysis.

Unit IV: Information Gathering: need, Information about the firms, Information gathering tools, Interviewing, Arranging the Interview, Guides to a Successful Interview, Types of Interviews and Questionnaires, The Structured and Unstructured Alternatives.

Unit V: Tools of Structured Analysis: The Dataflow Diagram (DFD), Data Dictionary, Decision Trees and Structured English.

Unit VI: Feasibility Study: System performance, Economic Feasibility, Technical Feasibility, Behavioral

Unit VII: Input/output and Forms Design: Input Design, CRT Screen Design, Output Design, and Requirements of form Design. H/W / S/W Selection, Make V/s Buy decision and Maintenance, Documentation: Importance, Types of documentation, Security and disaster planning and management.

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4. Unit IV: Information Gathering

5. Unit V: Tools of Structured Analysis

6. Unit VI: Feasibility Study

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8.	Documentation	
9.	MCQs	
10.	Glossary	

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Unit I

System Concepts and Information system environment

Introduction:

System analysis is the application or function of the system concept or system approach to solve the problem using computers. To solve the problem one must have knowledge of system and how an organization works in a system.

1 Define System and explain its characteristics.

Ans.: A System means an organized relationship among functioning units or components. It is an orderly grouping of interdependent components linked together according to a plan to achieve a specific objective. The elements of the system are as under:

(1) **Outputs and Inputs:** A major objective of a system is to produce an output that has value to its user. Whatever the nature of the output, it must be in line with the expectations of the intended user. Inputs are the elements that enter the system for processing and output is the outcome of the processing.

(2) **Processors:** The processor is the element of the system that involves the actual transformation of input into output. It is the operational component of a system. Processors modify the input totally or partially.

(3) **Control :** The control element guides the system. It is the decision-making subsystem that controls the pattern of activities governing input, processing and output.

(4) **Feedback :** Control in a dynamic system is achieved by feedback. Feedback measures output against a standard in some form that includes communication and control. Feedback may be positive or negative, routine or informational.

(5) **Environment:** It is the source of external elements that impinge on the system. It determines how a system must function.

(6) **Boundaries and Interfaces:** A system should be defined by its boundaries- the limits that identify its components, processes and interrelationships when it interfaces with another system.

The characteristics of a system are as under :

(6) **Organization:** It implies structure and order. It is the arrangement of components that helps to achieve objectives.

(7) **Interaction :** It refers to the manner in which each component functions with other component of the system. In an organization, for example, purchasing must interact with production, advertising with sales, etc.

(8) **Interdependence :** It means that parts of the organization or computer system depend on one another. They are coordinated and linked together according to a plan. One subsystem depends on the input of another subsystem for proper functioning.

(9) **Integration :** It refers to the completeness of systems. It is concerned with how a system is tied together. It is more than sharing a physical part or location. It means that parts of a system work together within the system even though each part performs a unique function.

(10) **Central Objective :** Objectives may be real or stated. Although a stated objective may be the real objective, it is not uncommon for an organization to state one objective and operate to achieve another.

Q.2 Explain the different types of Processing Systems.

Ans.: **Batch processing** is execution of a series of programs ("jobs") on a computer without human interaction. Batch jobs are set up so they can be run to completion without human interaction, so all input data is preselected through scripts or command-line parameters. This is in contrast to "online" or interactive programs which prompt the user for such input.

Batch processing has these benefits :

- It allows sharing of computer resources among many users,
- It shifts the time of job processing to when the computing resources are less busy,
- It avoids idling the computing resources with minute-by-minute human interaction and supervision,
- By keeping high overall rate of utilization, it better amortizes the cost of a computer, especially an expensive one.

Distributed computing deals with hardware and software systems containing more than one processing element or storage element, concurrent processes, or multiple programs, running under a loosely or tightly controlled regime.

In distributed computing a program is split up into parts that run simultaneously on multiple computers communicating over a network. Distributed computing is a form of parallel computing, but parallel computing is most commonly used to describe program parts running simultaneously on multiple processors in the same computer. Both types of processing require dividing a program into parts that can run simultaneously, but distributed programs often must deal with heterogeneous environments, network links of varying latencies, and unpredictable failures in the network or the computers.

Distributed programming typically falls into one of several basic architectures or categories: Client-server, 3-tier architecture, N-tier architecture, Distributed objects, loose coupling, or tight coupling.

- **Client - Server :** Smart client code contacts the server for data, then formats and displays it to the user. Input at the client is committed back to the server when it represents a permanent change.
- **3-tier Architecture :** Three tier systems move the client intelligence to a middle tier so that stateless clients can be used. This simplifies application deployment. Most web applications are 3-Tier.

- **N-tier Architecture :** N-Tier refers typically to web applications which further forward their requests to other enterprise services. This type of application is the one most responsible for the success of application servers.
- **Tightly Coupled (Clustered) :** Refers typically to a cluster of machines that closely work together, running a shared process in parallel. The task is subdivided in parts that are made individually by each one and then put back together to make the final result.
- **Peer-to-Peer :** an architecture where there is no special machine or machines that provide a service or manage the network resources. Instead all responsibilities are uniformly divided among all machines, known as peers. Peers can serve both as clients and servers

The time between the presentation of a set of inputs and the appearance of all the associated outputs is called the response time. A **real-time system** is one that must satisfy explicit bounded response time constraints to avoid failure. Equivalently, a real-time system is one whose logical correctness is based both on the correctness of the outputs and their timeliness. Notice that response times of, for example, microseconds are not needed to characterize a real-time system - it simply must have response times that are constrained and thus predictable. In fact, the misconception that real-time systems must be "fast" is because in most instances, the deadlines are on the order of microseconds. But the timeliness constraints or deadlines are generally a reflection of the underlying physical process being controlled. For example, in image processing involving screen update for viewing continuous motion, the deadlines are on the order of 30 microseconds.

An important concept in real-time systems is the notion of an event, that is, any occurrence that results in a change in the sequential flow of program execution. Events can be divided into two categories: synchronous and asynchronous. Synchronous events are those that occur at predictable times such as execution of a conditional branch instruction or hardware trap. Asynchronous events occur at unpredictable points in the flow-of-control and are usually caused by external sources such as a clock signal. Both types of events can be signaled to the CPU by hardware signals

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Q.3 what are the different types of systems?

Ans.:

iv. Physical or Abstract systems:-

Physical systems are tangible entities that may be static or dynamic in nature. Physical entities can be seen and counted.

Abstract system are conceptual or nonphysical entites.

v. Open or Closed system:-

In an open system, system take input from the outside and give the proccessd data as an output. Characteristics of open system are as input from outside, entropy, process, output and cycles, differentiation, equifinality.

In a closed system, system dose not take input from outside world as well does not provide any type of output to the outside world. In reality closed systems are rare.

vi. Man-Mad information system:-

Man-Mad information system can be of following types:-

- **Formal Information system:-**

  A formal information system is based on the orgainzation represented by the organization chart.

- **Informal Information system:-**

  The informal information system is employee based system designed to meet personal and vocational need of the system

- **Computer-Based Information System:-**

Computer-Based Information System relies on computer for handling business application.

It have following types:-

c) Management Information System:-

Management information system is a person-machine system and highly integrated collection of information processing functions.

d) Decision Support System:- A set of interrelated computer programs and the data vital to assist with analysis and decision-making within an organization.

c.) Data Processing System:-

In information processing, a Data Processing System is a system which processes data which has been captured and determined in a format identifiable by the data processing system or has been created and stored by another component of an information processing system.

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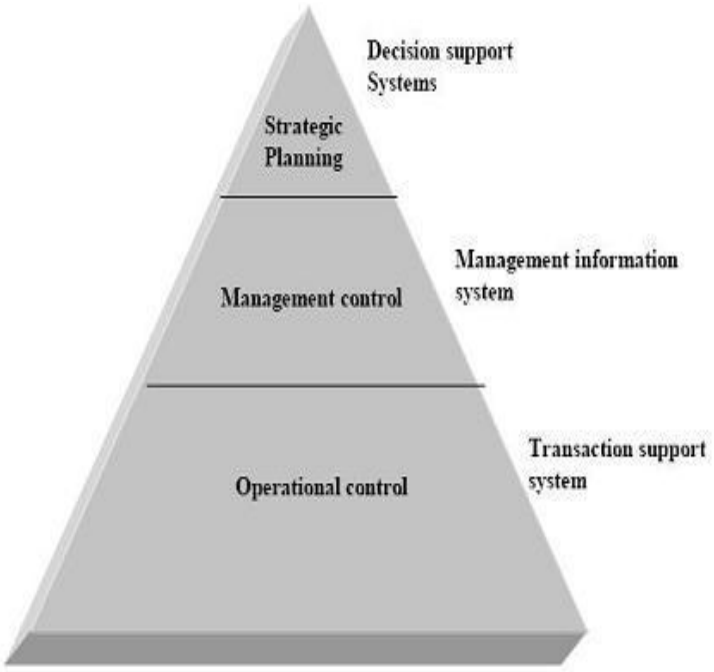

Figure 2 Computer based information system

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Case studies:-

You are in a coffee shop across the street from office having lunch. A customer

walks up to the counter. You observe the following:

Customer: Hi Dimple; I'd like a burger to go.

Dimple(waitress): Anything else?

Customer: Yes, a small order of fries and cold coffee.

Dimple: That'll be 82.35 Rs only.

She collects the cash and places the order through an electronic cash register that automatically displays the order on a TV screen in the back room where orders are prepared. When the order is ready, Dimple puts it in a bag and hands it to the customer.

Assignment

c.) Explain the pattern of this system in action. Specifically discuss the following:

vi.) The organization system's characteristics.

vii.) The subsystem, information flow, and interfaces.

viii.) The types of interdependence in the organization structure and the nature of feedback.

ix.) Input/output and environment

x.) Formal and Informal information system

d.) If you were to improve the performance of the system , what would you do? How? Explain.

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Unit-2

System Development Life Cycle

Introduction:

System Development and Life Cycle(SDLC) is an approach or a concept which is the collection of tools and technologies that help to convert a manual system into the computerized automated system or to develop the new one. Generally, there are six phases in the SDLC viz. Initial investigation, Feasibility study, Analysis, Design, Implementation, Post- implementation and maintenance.

Q.1 Describe System Development Life Cycle and explain its various phases.

Ans.: The Systems Development Life Cycle (SDLC) is a conceptual model used in project management that describes the stages involved in an information system development project from an initial feasibility study through maintenance of the completed application. Various SDLC methodologies have been developed to guide the processes involved including the waterfall model (the original SDLC method), rapid application development (RAD), joint application development (JAD), the fountain model and the spiral model. Mostly, several models are combined into some sort of hybrid methodology. Documentation is crucial regardless of the type of model chosen or devised for any application, and is usually done in parallel with the development process. Some methods work better for specific types of projects, but in the final analysis, the most important factor for the success of a project may be how closely particular plan was followed.

Feasibility : The feasibility study is used to determine if the project should get the go-ahead. If the project is to proceed, the feasibility study will produce a project plan and budget estimates for the future stages of development.

Requirement Analysis and Design : Analysis gathers the requirements for the system. This stage includes a detailed study of the business needs of the organization. Options for changing the business process may be considered. Design focuses on high level design like, what programs are needed and how are they going to interact, low-level design (how the individual programs are going to work), interface design (what are the interfaces going to look like) and data design (what data will be required). During these phases, the software's overall structure is defined. Analysis and Design are very crucial in the whole development cycle. Any glitch in the design phase could be very expensive to solve in the later stage of the software development. Much care is taken during this phase. The logical system of the product is developed in this phase.

Implementation : In this phase the designs are translated into code. Computer programs are written using a conventional programming language or an application generator. Programming tools like Compilers, Interpreters, Debuggers are used to generate the code. Different high level programming languages like C, C++, Pascal, Java are used for coding. With respect to the type of application, the right programming language is chosen.

Testing : In this phase the system is tested. Normally programs are written as a series of individual modules, these are subject to separate and detailed test. The system is then tested as a whole. The separate modules are brought together and tested as a complete system. The system is tested to ensure that interfaces between modules work (integration testing), the system works on the intended platform and with the expected volume of data (volume testing) and that the system does what the user requires (acceptance/beta testing).

Maintenance : Inevitably the system will need maintenance. Software will definitely undergo change once it is delivered to the customer. There are many reasons for the change. Change could happen because of some unexpected input values into the system. In addition, the changes in the system could directly affect the software operations. The software should be developed to accommodate changes that could happen during the post implementation period.

Q.2 What is the role of a Systems Analyst?

Ans.: System Analysts bridges the gap that always exists between those who need computer-based business solutions. They understand both business and computing. They study business problems and opportunities and then transform business and information requirements into specifications for information systems that will be implemented by various technical specialists including computer programmers. System Analysts initiate change within an organization. Every new system changes the business. System Analyst is basically a problem solver.

An analyst must possess various skills to effectively carry out the job. Specifically, they may be divided, into two categories: Interpersonal and technical skills. Both are required for system development. *Interpersonal* skills deal with, relationships and the interface .of the analyst with people in business. They are useful in establishing trust's resolving conflict, and communicating information. Technical skills, on the other hand, focus an procedures and techniques for operations analysis, systems analysis, and computer science

The **interpersonal skills** relevant to systems work include the following :

- Communication
- Understanding
- Foresightedness and Vision
- Adaptability and Flexibility Skills
- Teaching
- Selling
- Patience and Rationality
- Management Skills
- Leadership Quality
- Training and Documentation Capability

Technical skills include:

- Creativity-

- Problem solving-
- Project management-
- Dynamic interface-
- Questioning attitude and inquiring mind-
- Knowledge-

Q.3 **What are the models and different types of models?**

c.) Waterfall model or Classic Life Cycle Model or Linear Sequential Model

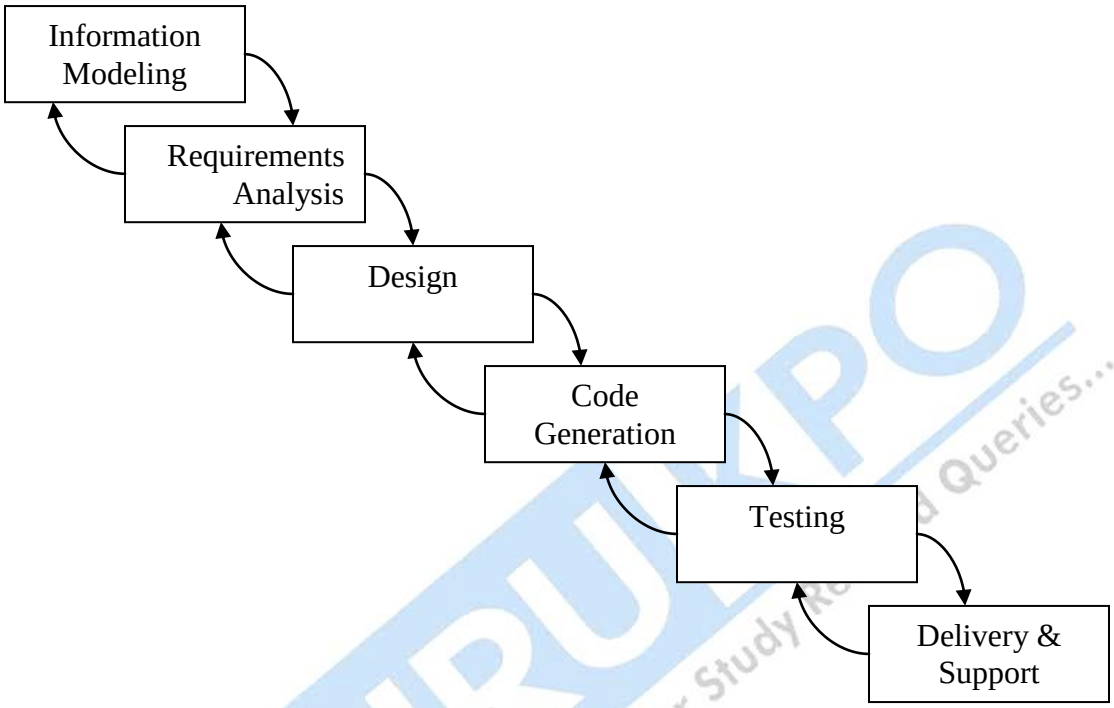
d.) Prototype process model

Ans.:

a.) **Waterfall Model**

Sometimes called the *classic life cycle or the linear sequential model,* the *waterfall model* is a systematic, sequential approach to software development in which development is seen as flowing downwards (like a waterfall) that begins at the system level and progresses through analysis, design, coding, testing and support. To follow the waterfall model, one proceeds from one phase to the next in a sequential manner. For example, one first completes "requirements specification". When the requirements are fully completed, one proceeds to design. The software is designed (on paper) and this design should be a plan for implementing the requirements given. When the design is fully completed, an implementation of that design, i.e. coding of the design is made by programmers. After the implementation phases are complete, the software product is tested and debugged; any faults introduced in earlier phases are removed here. Then the software product is installed, and later maintained to add any new functions that the user needs and remove bugs. Thus in a waterfall model, we can move to the next step only when the previous step is completed

and removed of all errors. There is no jumping back and forth or overlap between the steps in a waterfall model.



The model consists of six distinct stages, namely :

(7) In the *Information Modelling* phase

(a) Work begins by gathering information related to the existing system. This will consists of all items consisting of hardware, people, databases etc.

(8) In the *requirements analysis* phase

(a) The problem is specified along with the desired objectives (goals).

(b) The constraints are identified.

(c) All information about the functions, behaviour, and performance are documented and checked by the customers.

(9) In the *design phase*, all inputs, computations and outputs of the system should be converted into a software model so that it can be coded by

programmers. The hardware requirements are also determined at this stage along with a picture of the overall system architecture.

(10) In the *code generation* phase, the design has to be translated into a machine-readable form using any of the programming languages available that is suitable for the project.

(11) In the *testing* phase stage

(a) Once code is generated, testing begins.

(b) It focuses on all the statements of the software and removes all errors.

(c) It ensures that proper input will produce actual results.

(d) Detailed documentation from the design phase can significantly reduce the coding effort.

(12) The *delivery and support* phase consists of delivering the final product to the customer and then taking care of the maintenance of the product. In this phase the software is updated to :

(a) Meet the changing customer needs

(b) Adapted to accommodate changes in the external environment

(c) Correct errors that were not previously known in the testing phases

(d) Enhancing the efficiency of the software

b.)Prototype Process Model

The prototyping model begins with the requirements gathering. The developer and the customer meet and define the objectives for the software, identify the needs, etc. A 'quick design' is then created. This design focuses on those aspects of the software that will be visible to the customer. It then leads to the construction of a prototype. The prototype is then checked by the customer and any modifications or changes that are required are made to the prototype. Looping takes place in this process and better versions of the prototype are created. These are continuously shown to the user so that any new changes can be updated in the prototype. This process continues till the user is satisfied with the system. Once a user is satisfied, the prototype is converted to the actual system with all considerations for quality and security.

The prototype is considered as the 'first system'. It is advantageous because both the customers and the developers get a feel of the actual system. But there are certain problems with the prototyping model too.

(4) The prototype is usually created without taking into consideration overall software quality.

(5) When the customer sees a working model in the form of a prototype, and then is told that the actual software is not created, the customer can get irritated.

(6) Since the prototype is to be created quickly, the developer will use whatever choices he has at that particular time (eg, he may not know a good programming language, but later may learn. He then cannot change the whole system for the new programming language). Thus the prototype may be created with less-than-ideal choices.

Q.5 Describe the Rapid Application Development Model. State its disadvantages.

Ans.: Rapid Application Development (RAD) is an incremental software development process model that focuses on a very short development cycle. The RAD model is a 'high-speed' version of the linear sequential model. It enables a development team to create a fully functional system within a very short time period (e.g. 60 to 90 days).

Business Modeling : *The information flow among business functions is modeled in a way that answers the following questions :*

What information drives the business process?

What information is generated?

Who generates it?

Where does the information go?

Who processes it?

Data Modeling : *It gives all the details about what data is to be used in the project. All the information found in the business modeling phase is refined into a set of data objects and the characteristics and the relationships between these objects are defined.*

Process Modeling : *Here all the processes are defined that are needed to use the data objects to create the system. Processing descriptions are created for adding, modifying, deleting, or retrieving a data object.*

Application Generation : *RAD makes use of the fourth generation techniques and tools like VB, VC++, Delphi etc rather than creating software using conventional third generation programming languages. The RAD reuses existing program components (when possible) or creates reusable components (when necessary). In all cases, automated tools (CASE tools) are used to facilitate construction of the software.*

Testing and Turnover : Since the RAD process emphasizes reuse, many of the program components have already been tested. This minimizes the testing and development time.

If a business application can be divided into modules, so that each major function can be completed within the development cycle, then it is a candidate for the RAD model. In this case, each team can be assigned a model, which is then integrated to form a whole.

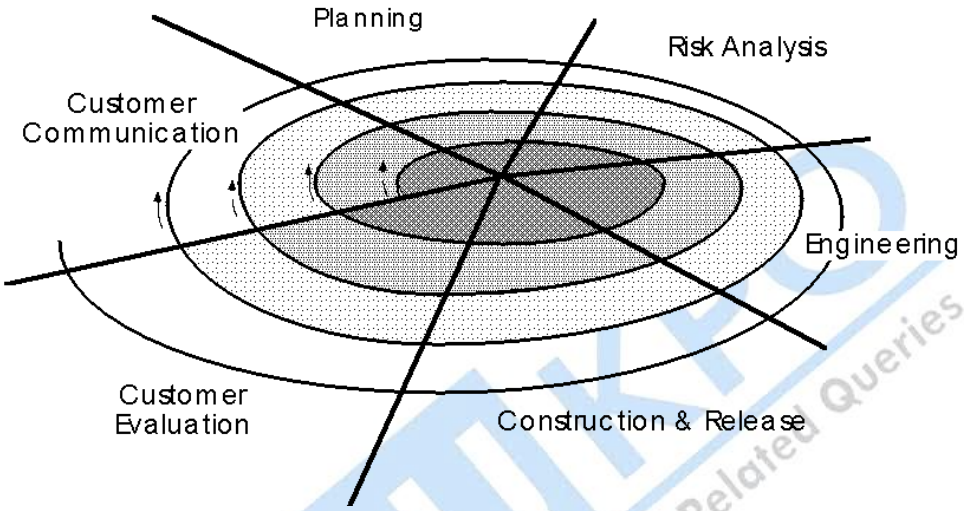
Disadvantages :

- For Large projects, RAD requires sufficient resources to create the right number of RAD teams.
- If a system cannot be properly divided into modules, building components for RAD will be problematic
- RAD is not appropriate when technical risks are high, e.g. this occurs when a new application makes heavy use of new technology.

Q.6 Explain the Spiral Model. What are the advantages of this model?

Ans.: The spiral model, combines the iterative nature of prototyping with the controlled and systematic aspects of the waterfall model, therein providing the potential for rapid development of incremental versions of the software. In this model the software is developed in a series of incremental releases with the early

stages being either paper models or prototypes. Later iterations become increasingly more complete versions of the product.



As illustrated, the model is divided into a number of task regions.

These regions are :

(7) The **customer communication** task – to establish effective communication between developer and customer.

(8) The **planning** task – to define resources, time lines and other project related information..

(9) The **risk analysis** task – to assess both technical and management risks.

(10) The **engineering** task – to build one or more representations (prototypes) of the application.

(11) The **construction and release** task – to construct, test, install and provide user support (e.g., documentation and training).

(12) The **customer evaluation** task – to obtain customer feedback based on the evaluation of the software representation created during the engineering stage and implemented during the install stage.

The evolutionary process begins at the centre position and moves in a clockwise direction. Each traversal of the spiral typically results in a deliverable. For example, the first and second spiral traversals may result in the production of a product specification and a prototype, respectively. Subsequent traversals may then produce more sophisticated versions of the software.

An important distinction between the spiral model and other software models is the explicit consideration of risk. There are no fixed phases such as specification or design phases in the model and it encompasses other process models. For example, prototyping may be used in one spiral to resolve requirement uncertainties and hence reduce risks. This may then be followed by a conventional waterfall development.

Advantages of the Spiral Model :

- The spiral model is a realistic approach to the development of large-scale software products because the software evolves as the process progresses. In addition, the developer and the client better understand and react to risks at each evolutionary level.
- The model uses prototyping as a risk reduction mechanism and allows for the development of prototypes at any stage of the evolutionary development.
- It maintains a systematic stepwise approach, like the classic life cycle model, but incorporates it into an iterative framework that more reflect the real world.
- If employed correctly, this model should reduce risks before they become problematic, as consideration of technical risks are considered at all stages.

Q.7 Explain Information Gathering Process for System Development.

OR

Explain Fact Finding Method of System Analysis.

Ans.: Fact finding means learning as much as possible about the present system. The tools used in information gathering or fact finding are

(1) **Review of Written Documents :** In all organizations documents such as forms, records, reports, manuals, etc are available. These help in determining how the present system runs. The process of fact finding includes collection of all possible documents and evaluating them. Unfortunately, most manuals are not up to date and may not be readable. The analyst needs to find out how the forms are filled out, what changes need to be made and how easy they are to read.

(2) **On-Site Observation :** The purpose of on-site observation is to get as close as possible to the real system being studied. It is the process of recognizing and noting people, objects and occurrences to obtain information. As an observer the analyst must follow a set of rules. He/she must listen than talk and not give advice or pass a moral judgment, must not argue or show friendliness towards others. The following questions can serve as a guide for on-site observations:

- What kind of system is it? What does it do?
- Who runs the system? Who are the important people in it?
- What is the history of the system?

(3) **Interviews :** An interview is a face to face interpersonal situation in which a person called the interviewer asks a person being interviewed, questions designed to gather information about a problem. The analyst or interviewer can schedule interviews with key personnel of the organization. The analyst also needs to conduct detailed interviews with all the people who will actually use the system. This will provide all the details the analyst needs and also remove any fear from the users that the computers will replace the. Interviews help gather vital facts about the existing problems, such as lack of quality control or security, etc. Interviewing needs a friendly atmosphere so that the interviewer can ask questions properly, obtain reliable and correct answers and record the answers accurately and completely.

(4) **Questionnaires :** A questionnaire is a tool that has questions to which individuals respond. A questionnaire has the following advantages:

- It is economical and requires less skill than an interview.
- It can be used to gather data from large number of people simultaneously

- It is a uniform method in which all question asked are the same to all people
- The users are happy as they know that the answers they give are confidential
- User get time to think about the questions and so can give more accurate results than in an interview

□ □ □

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Case studies:

The vice president of a large retail store wants to modify is order entry system. He states the problem as follows: "I need a report that gives me information about the previous or old records."

Assignment:

c.) Outline the procedure which you follow. [hint: follow the steps of SDLC]

d.) What questions would you ask?

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Unit-3

System Planning and Initial Investigation

Introduction:

System Planning and the Initial investigation both are the most critical and important part of any project life cycle. A wrong initial investigation and planning can lead the system to the failure.

Q.1 What is planning? what are the bases for planning in System Analysis?

Ans.: Planning is the process of setting goals, developing strategies and outlining task and program to accomplish the goal.

Planning the information system in the business is very important in today's competitive environment to make the business high grow able, and to make business retain in adverse conditions because:-

d.) Information is very important recourse for any company to be managed and it is equally important as the cash, personnel etc.

e.) Financial resources are committed to the information system.

f.) To make the system growing and retain in the competitive environment.

Q.2 What is initial investigation? What are the strategies for determining information requirements?

Ans.: First step in SDLC is the identification of the user's need. The initial investigation is one way to do this. Another objective at this stage is to determine whether the user's need is feasible or not.

Strategies for determining information requirements are:-

4.) Asking.

5.) Getting information from present system.

6.) Prototyping.

Q.3 What are the steps in the initial investigation?

Ans.: Initial investigation have following steps:-

6.) Problem definition.

Problem definition is the process of identifying the need of the user which led him to request for the system change.

7.) Background analysis:-

Background analysis is the process of getting the basic information about the customer's company or organization i.e. How it really works? What people are involved in it? Etc.

Background analysis helps the system analyst to prepare the organization chart with the list of people and functions.

8.) Fact finding:-

After obtaining the background information, analyst start gathering the data like input, output and cost of the existing system. Information can be gathered by following tools:-

d.) Review of written documents.

e.) On-site observations

f.) Interview and questionnaires

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9.) Fact Analysis :-

After the collection of data it must be organized and evaluated so that report can be prepared for the final approval from the user.

10.) Determination of Feasibility:-

After organizing data, and fact analysis feasibility is evaluated and determine that any alternative proposal is possible or not for the customer's

Project.

Case studies:

Allied concrete, Inc., has had to renovate its approach to maintain a computer system and converting application. Recently management has established a direction-finding committee to supervise and support all applications before they are run on the mainframe. The committee consists of one member from each of the following areas: accounting, sales, production, and information system. The committee is chaired by the vice president in charge of production. The primary charge is to review each user request and approve or disapprove it based on feasibility and priority. If a request is approved, the user department is billed for its includes computer time, analyst and programmer time, and supplies. All department heads have agreed to the new policy.

In formalizing the committee's authority and responsibilities, serious questions were raised by several user departments about whether the committee has the authority to turn down a project even if it is project out of their budget, there is no reason for it to be rejected.

Assignment:

c.) Should all user projects that are operationally and technically feasible be developed as long as the user is paying the price? If so, what should be the role of the direction-finding committee?

d.) What do you think of the makeup of the direction-finding committee? What role should the analyst, programmer, or data base specialist play in a direction-finding committee? Elaborate.

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Unit-4

Information Gathering

Introduction:

The key part of feasibility analysis is Information Gathering about the present system. Improper and wrong gathering of information may lead the system to the failure. The

mistaken gathering of data at the initial level affects the system life cycle at every phase and finally causes the system failure. There are many tools and techniques that help to collect the correct and efficient data that help to develop the system which satisfy the needs of customer.

Q.1 What is information gathering?

Ans Information gathering is an art and science of gathering information regarding present system so that designing a new system will be easy as well as free from errors and upto the customer requirement.

Q.2 where does the information originates?

Ans Information is gathered from main principal sources:

Primary Internal sources:

1.) Financial reports.

2.) Personal staff.

3.) Professional staff, EDP

4.) System documentaion or manuals.

5.) The user or user staff.

6.) Reports and transaction documents.

Primary external resources:

1.) Vendors.

2.) Government documents.

3.) Newspapers and professional journals.

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Q.3 what are the tools for information gathering?

Ans Tools for information gathering are:-

1.) Review of Literature, Procedures, and Forms.

Procedures manuals and forms are useful sources for the analyst. They describe the format and functions of the present system. Up-to-date manuals save hours of information-gathering time.

2.) On-Site Observation.

On-Site Observation is the process of recognizing and noting people, objects, and occurrence to obtain information. The major objective of on-site observation is to get as close as possible to the "real" system being studied. The emphasis is not on giving advice or passing moral judgment on what is observed . Furthermore, care is taken not to argue with the persons being observed.

3.) Interviews and Questionnaires.

Interview and Questionnaires used in system analysis are relatively direct. This is the strength because much of the information needed can be acquired by direct questions.

Interview:

Interview is the oldest and most often used device for gathering information. Interview is a face-to-face interpersonal role situation to gather information about a problem area.

Guidelines for successesful Interview:

a.) Set the stage for the interview.

b.) Establish rapport: put the interviewee at ease.

c.) Phase questions clearly.

d.) Be good listener, avoid arguments.

e.) Evaluate the outcome of the interview.

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Questionnaires:

Questionnaires are used for almost any tool that has questions to which individuals respond. It requires less skills and time then interview. The questionnaires place less pressure on subject for immediate responses.

Case Studies:

A large wholesale juice distributer has been having difficulty keeping inventory up to date because incoming shipments are not processed quickly enough. The sales force can never be assured which brands and quantities are existing for sale. The vice president of sales asks an outside analyst to examine the problem.

The analyst arrived at the computer center Monday at 8:00 A.M. He asked to see the manager. The receptionist told him that Mr. Arvind came around 9.00 A.M. Not wanting to waste an hour, the analyst determined to interview the programmers to learn about inventory control.

Mr. Arvind arrived at 8.45. He was furious to find that the analyst has taken the liberty to his staff without his consent. He promptly told the analyst that Monday is a bad day. The programmers could no be interrupted before 3.30 P.M on Tuesday. The analyst decided to come then. in the meantime, he went to stockroom to watch stock keeping activities.

The next day, the analyst interviewed more employees in the stockroom and the clerical staff of the warehouse. It was 4.30 P.M then he remembers his appointment with manager of the computer center. He suddenly ended his work in the warehouse and rushed back to the computer center for the interview. The manager had been waiting for an hour and was in an irritable mood. To make things worse, the firm's employees quit work at 5:00 P.M. The manager decided to go ahead with the interview.

The analyst inquired about data capture, stock activities, data flow, processing routines, and stock status reports. After a brief rundown on the procedures used and the report generated, the analyst was curtly dismissed. It was 5:00 P.M

The analyst had more questions to ask but had to stop. At the same time, he was wondering why the manager was so irritable throughout the interview.

Assignment:-

a.) How do you assess the analyst's performance on the job? Explain.

b.) Evaluate the procedure the analyst used in meeting the manager of the computer center.

c.) How adequately prepared was the analyst for the first interview?

d.) If you were the system analyst, would you have handled this project? Elaborate.

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Unit-5

Tools of Structured Analysis

Introduction:

Tools of structured analysis overcome the drawbacks of traditional tools used for data gathering. Structured tools such as Data Flow Diagram, Data Dictionary, and Structure English provide alternative ways to design candidate system. Some real-life applications requerie the combination of both structured tools as well as traditional tools.

Q.1 What is structured analysis?

Ans.: Structured analysis is a set of techniques and graphial tools that allow the analyst to develop a new kind of system specification that are easily understandable to the user.

Q.2 What are the tools of structured analysis and design? Describe each tool.

1.) Data Flow Diagram.

2.) Data Dicitionary.

3.) Structured English

4.) Dicision Tree.

5.) Dicision Tables

6.) Context Diagram

7.) E-R Diagram

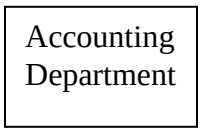
Ans.:

1) Data Flow Diagram(DFD):-

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system. It describes the system's data and how the processes transform the data in a graphical manner. Data flow diagrams can be used to provide a clear representation of any business function. It starts with an overall picture of the business and continues by analyzing each of the functional areas of interest. It uses a top-down approach to show all the levels of the functions of the system. Initially a **context diagram** is drawn, which is a simple representation of the entire system under investigation. This is followed by a level 1 diagram; which provides an overview of the major functional areas of the business. The level 1 diagram identifies the major business processes at a high level and any of these processes can then be analyzed further - giving rise to a corresponding level 2 business process diagram. This process of more detailed analysis can then continue – through level 3, 4 and so on.

DFD Notation :

A rectangle



It denotes an external entity. It defines a source or destination of system data. It can represent a person, group of people, department, or some other system.

A circle

It denotes a process or activity. It is also known as a bubble. It shows how the system transforms inputs into outputs. Each process is named.

A line with an arrowhead

It denotes the direction of data flow. The input to, or output from, a given process, which is associated with each arrow in a DFD.

Open Rectangle

It denotes a store that is used to model collection of data. It may refer to files or databases, or data stored on punched cards, optical disk, etc. It is shown by two parallel lines with the name of the data store between them

7.) Data Dictionary.

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A Data Dictionary (DD) is a structured repository of data about data. It is a set of accurate definitions of all DFD data elements and data structures. A data dictionary defines each term encountered during the analysis and design of a new system. Data dictionary is the place where we keep the details of the contents of data flows, data stores & processes.

Without a data dictionary the development of large systems becomes difficult. The data dictionary is an effective solution to the problem of complicated nature. The main purpose of a data dictionary is to provide a source of reference in which the analyst, the user, the designer can look up & find out its content and any other relevant information.

The main advantage of a DD is the documentation. It is a valuable reference to the organization which helps in communication between the analyst and the user. It is also important in building a database.

The Data Dictionary notations are

= is composed of

+ AND

( ) Optional value

[ ] Either/Or

{} iteration

** comment

@ identifier (key field)

| separates alternative choices in the [] construct

Examples of Data dictionary –

Name = Courtesy-Title + First-Name + (Middle-Name) + Last-Name

Courtesy-Title = [Mr. | Miss | Mrs. | Ms. | Dr. | Prof.]

First-Name = { Legal-Character }

Last-Name = { Legal-Character }

Legal-Character = [A-Z | a-z |0-9| ' | - | |]

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8.) Structured English:-

Structured English or pseudo code or program design language (PDL) uses the vocabulary of English and the syntax of a structured programming. Structured English looks like a modern programming language. The difference between structured English and a real programming language is in the use of narrative text which is placed within the structured English statements. Structured English cannot be compiled. It should have the following characteristics:

- A fixed syntax of keywords used for structured constructs, data declaration
- A free syntax of natural language that describes processing
- Data declaration facilities that include simple(array) and complex(linked list or tree) data structures
- Facility to declare subprograms and call them

Decisions in Structured English are made through IF, THEN, ELSE, SO, etc.

9.) Decision Tree:-

Decision tree are graphical representation methods of representing a sequence of logical decisions. It is mainly used when decisions need to be taken or for defining policies. A decision tree has as many branches as there are logical alternatives. It is easy to construct, easy to read and easy to update. A decision tree is used to identify the strategy most likely to reach a goal. It is also used as a means for calculating probabilities or making financial or number based decisions. A decision making tree is essentially a diagram that represents, in a specially organized way, the decisions, the main external or other events that introduce uncertainty, as well as possible outcomes of all those decisions and events.

10.) Decision Table:-

Decision tables are a precise yet compact way to model complicated logic. Decision tables, like if-then-else and switch-case statements, associate conditions with actions to perform. But, unlike the control structures found in traditional programming languages, decision tables can associate many independent conditions with several actions in an elegant way. Decision tables are typically divided into four quadrants, as shown below.

The four quadrants	
Conditions	Condition alternatives
Actions	Action entries

Each decision corresponds to a variable, relation or predicate whose possible values are listed among the condition alternatives. Each action is a procedure or operation to perform, and the entries specify whether (or in what order) the action is to be performed for the set of condition alternatives the entry corresponds to. Many decision tables include in their condition alternatives the **don't care** symbol, a hyphen. Using don't cares can simplify decision tables, especially when a given condition has little influence on the actions to be performed. In some cases, entire conditions thought to be important initially are found to be irrelevant when none of the conditions influence which actions are performed. The limited-entry decision table is the simplest to describe. The condition alternatives are simple boolean values, and the action entries are check-marks, representing which of the actions in a given column are to be performed.

A technical support company writes a decision table to diagnose printer problems based upon symptoms described to them over the phone from their clients.

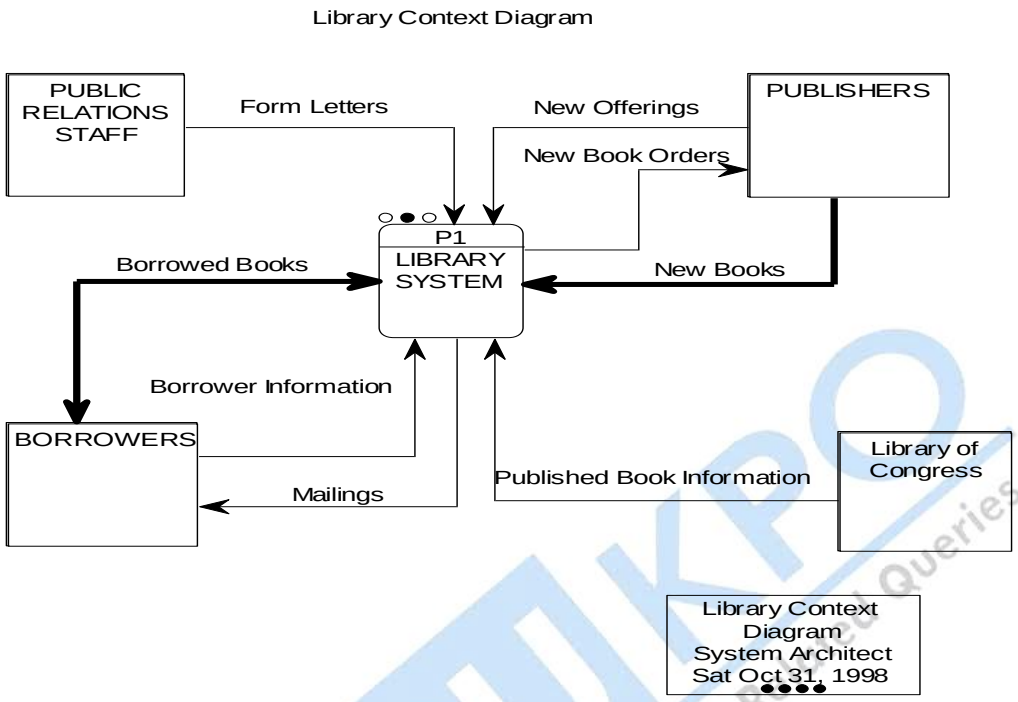
Printer troubleshooter		
		Rules

Conditions	Printer does not print	Y	Y	Y	Y	N	N	N	N
	A red light is flashing	Y	Y	N	N	Y	Y	N	N
	Printer is unrecognized	Y	N	Y	N	Y	N	Y	N
Actions	Check the power cable			X					
	Check the printer-computer cable	X		X					
	Ensure printer software is installed	X		X		X		X	
	Check/replace ink	X	X			X	X		
	Check for paper jam		X		X				

Decision tables make it easy to observe that all possible conditions are accounted for. In the example above, every possible combination of the three conditions is given. In decision tables, when conditions are omitted, it is obvious even at a glance that logic is missing. Compare this to traditional control structures, where it is not easy to notice gaps in program logic with a mere glance --- sometimes it is difficult to follow which conditions correspond to which actions!

Just as decision tables make it easy to audit control logic, decision tables demand that a programmer think of all possible conditions. With traditional control structures, it is easy to forget about corner cases, especially when the else statement is optional. Since logic is so important to programming, decision tables are an excellent tool for designing control logic.

11.) Context Diagram:-



The context diagram shown on this screen represents a book lending library. The library receives details of books, and orders books from one or more book suppliers. Books may be reserved and borrowed by members of the public, who are required to give a borrower number. The library will notify borrowers when a reserved book becomes available or when a borrowed book becomes overdue. In addition to supplying books, a book supplier will furnish details of specific books in response to library enquiries. After the context model is created the process is exploded to the next level to show the major processes in the system. Depending upon the complexity of the system each of these processes can also be exploded into their own process model. This continues until the goal of each process accomplishing a single function is reached. Because of this approach the context model is referred to as Level 0 (Zero) DFD, the next as Level 1 DFD, etc.

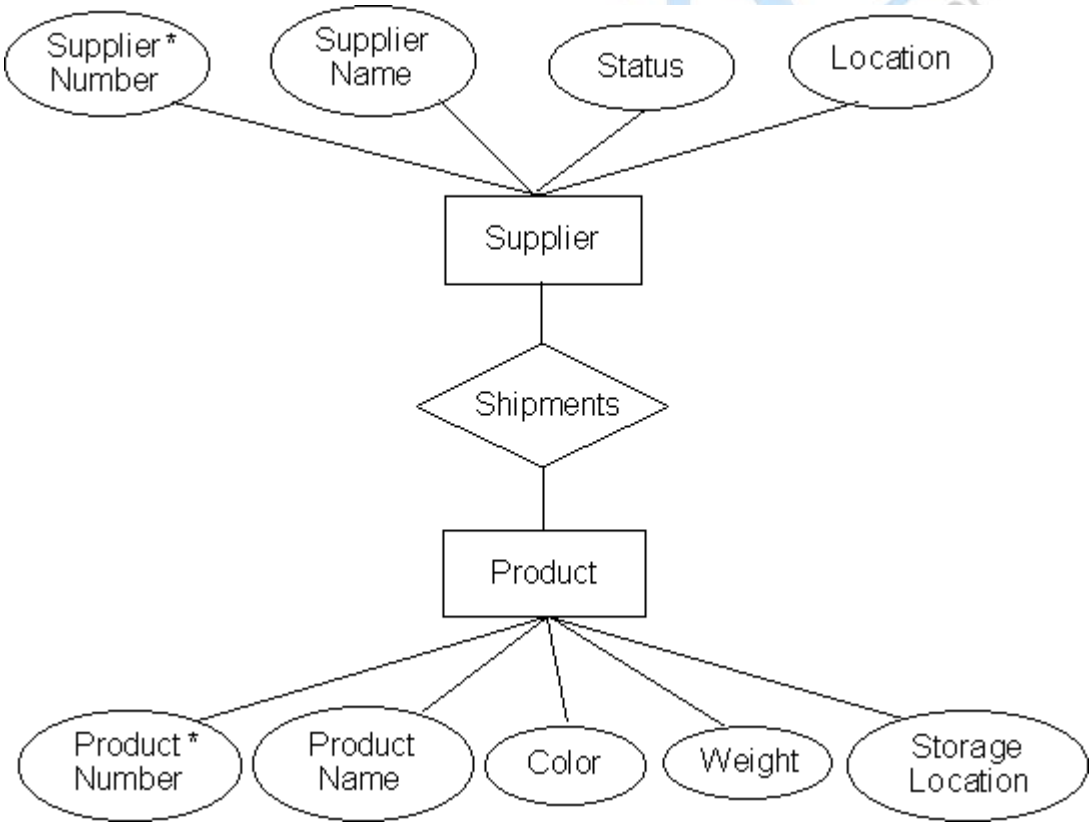
12.) E-R diagram

Data models are tools used in analysis to describe the data necessities and assumptions in the system from a top-down point of view. They also set the stage for the design of databases later on in the SDLC.

There are three fundamental elements in ER models:

- *Entities are the "things" about which we search for information.*
- *Attributes are the data we gather regarding the entities.*
- *Relationships provide the formation needed to describe information from various entities.*

In general, ERD's look likes this:



Q.3 What are Structure Charts? Describe.

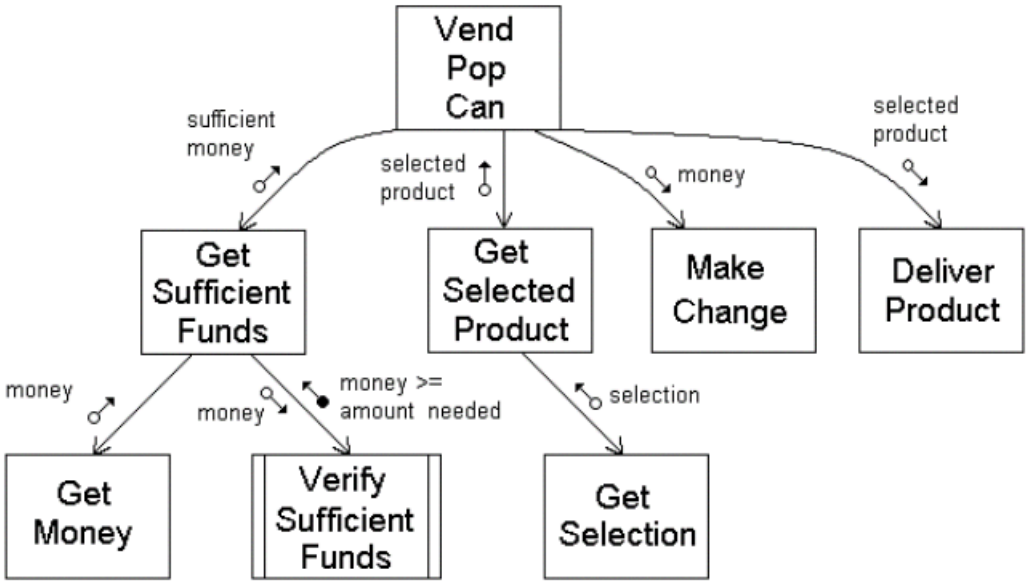
Ans.: Structure Chart : A hierarchical diagram showing the relationships between the modules of a computer program. A module is the basic component of a structure chart and is used to identify a function. Modules are relatively simple and independent components. Higher-level modules are "control" modules that control the flow of execution. Lower level modules are "worker bee" modules and contain the program logic to actually perform the functions.

The vertical lines connecting the modules indicate the calling structure from the high-level modules to the lower-level modules. The little arrows next to the lines show the data that is passed between modules and represent the inputs and outputs of each module. At the structure chart level, we are not concerned with what is happening inside the module yet. We only want to know that somehow it does the function indicated by its name using the input data and producing the output data. A program call is when one module invokes a lower-level module to perform a needed service or calculation. Program call: The transfer of control from a module to a subordinate module to perform a requested service. The arrows with the open circle, called data couples, represent data being passed into and out of the module. A data couple can be an individual data item (e.g., a flag or a customer account number) or a higher-level data structure (e.g., an array, record, or other data structure). The arrow with the darkened circle is a "flag." A flag is purely internal information that is used between modules to indicate some result. Data couples: The individual data items that are passed between modules in a program call.

A basic idea of structured programming is that each module only has to do a very specific function. The module at the very top of the tree is the "boss" module. Its functions will be to call the modules on the next tier, pass information to them, and receive information back. The function of each middle-level module is to control the processing of the modules below it. Each has control logic and any error-handling logic that is not handled by the lower-level

module. The modules at the extremities, or the leaves, contain the actual algorithms to carry out the functions of the program.

Structure charts are developed to design a hierarchy of modules for a program. A structure chart is in the form of a tree with a root module and branches. A subtree is simply a branch that has been separated from the overall tree. When the subtree is placed back in the larger tree, the root of the subtree becomes just another branch in the overall tree.



Q.4 What is a HIPO Chart? Explain.

Ans.: HIPO charts show relationships between modules. It describes the data input and output from the processes and defines the data flow. It provides a structure by which the functions of a system can be understood. It also provides a visual description of input to be used and output to be produced for each level of the diagram. It makes the transformation from input to output data visible.

There are two parts to a HIPO chart, a hierarchy chart and an IPO chart.

The **hierarchy chart** is useful for showing hierarchy of procedures within a program. Hierarchy charts are also called structure charts, top-down charts, or VTOC (Visual Table of Contents) charts. All these names refer to planning diagrams that are similar to a company's organization chart. Hierarchy charts depict the organization of a program but omit the specific processing logic. They

describe what each part, or module, of the program does and how the modules relate to each other.

The **IPO** chart describes the system in terms of its inputs, outputs and the processes that are performed on the inputs to transform them into outputs. It provides the following :

(d) The Input section that contains the data items used by the process steps.

(e) The Output section that contains the data items created by the process steps.

(f) Process section that contains numbered steps that describe the functions to be performed. Arrows connect them to the output steps and the input/output data items.

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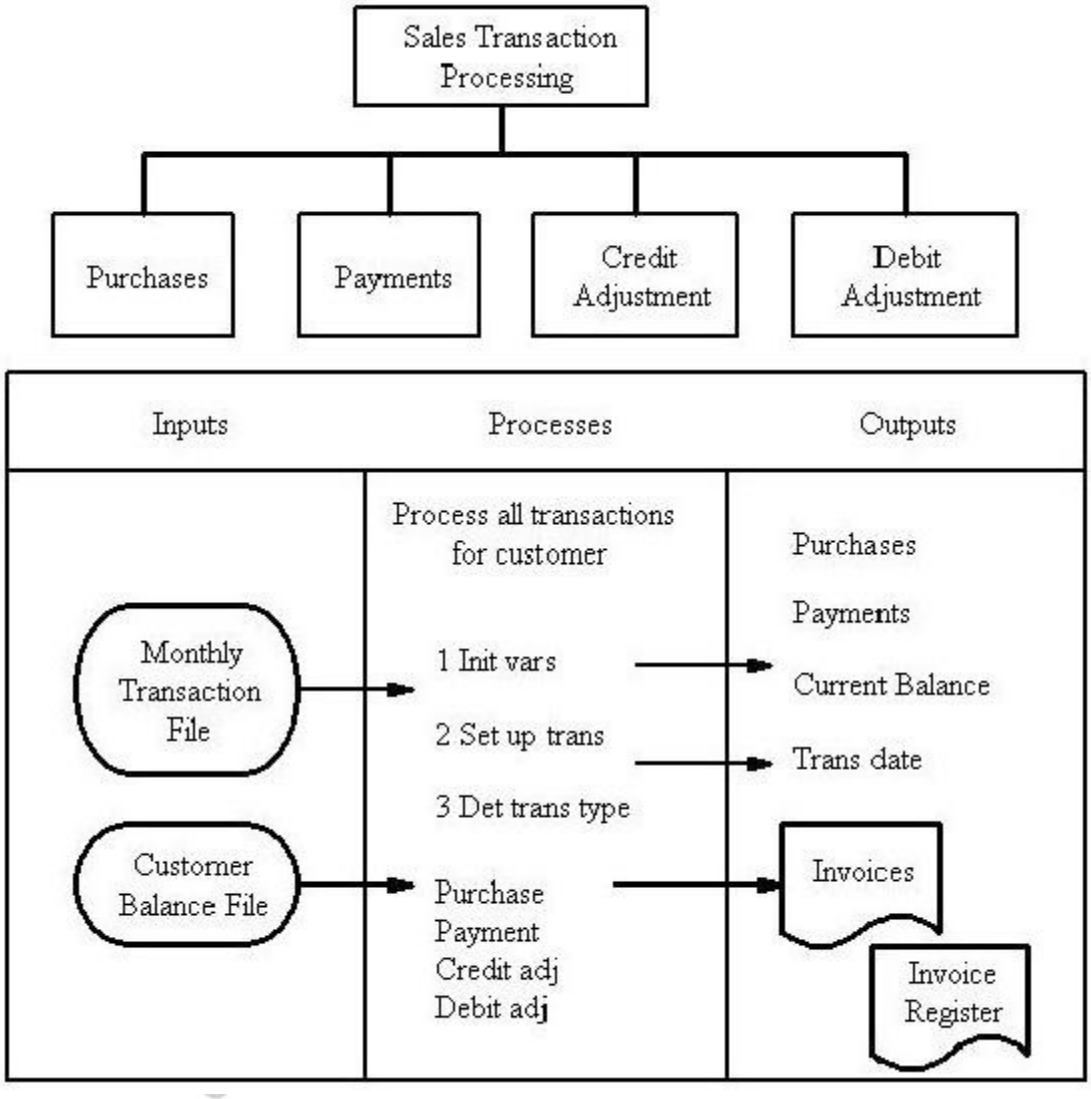
The IPO chart is in the form of a table with three columns, one for each of Input, Output and Process. The flow between screens is indicated by the use of arrows.



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Q.4 How to draw a Decision Tree?

Ans.: You start a decision tree with a decision that needs to be made. This decision is represented by a small square towards the left of a large piece of paper. From this box draw out lines towards the right for each possible solution, and write that solution along the line. At the end of each solution line, consider the results. If the result of taking that decision is uncertain, draw a small circle. If the result is another decision that needs to be made, draw another square. **Squares represent decisions; circles represent uncertainty or random factors.** Write the decision or factor to be considered above the square or circle. If you have completed the solution at the end of the line, just leave it blank. Starting from the new decision squares on your diagram, draw out lines representing the options that could be taken. From the circles, draw out lines representing possible outcomes. Again mark a brief note on the line saying what it means. Keep on doing this until you have drawn down as many of the possible outcomes and decisions as you can see leading on from your original decision.

Example: Book return policy in library

If a Faculty returns a book late, a fine of 5% of the book rate is charged. If a Student returns a book late by 3 days, fine is 10%, else 20% of book rate.

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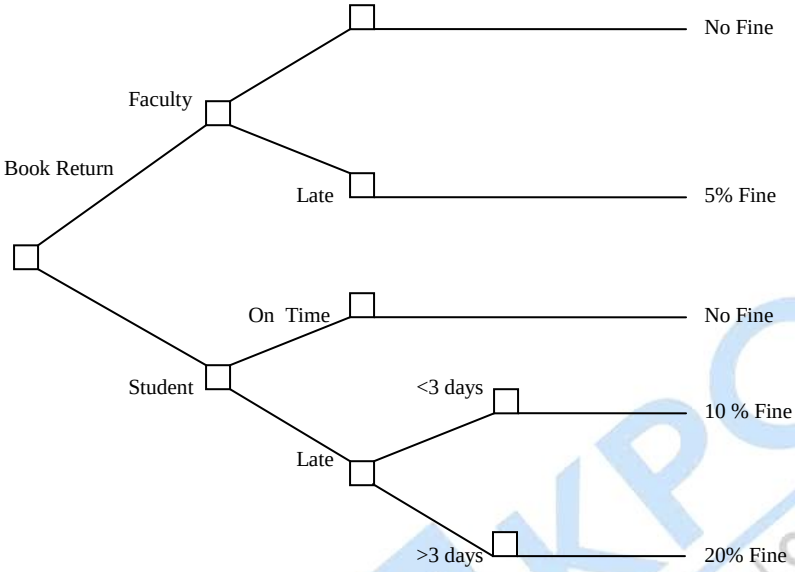


Q.5 In context with an ER diagram explain Cardinality and Modality. Give example.

Ans.: Cardinality : The elements of data modeling – data objects, attributes and relationships provide information only about which objects are related to one another. But this information is not sufficient for software engineering purpose. Cardinality specifies how many instances or occurrences of object X are related to how many occurrences of object Y. Cardinality is usually expressed as 'one' or 'many'. Thus two objects can be related as

(4) **One-to-One (1:1) :** An occurrence of object A can relate to one and only one occurrence of object B and an occurrence of B can relate to only one occurrence of A.

(5) **One-to-Many (1:N) :** One occurrence of object A can relate to one or many occurrences of object B but an occurrence of B can relate to only one occurrence of A. E.g. mother can have many children, but a child can have only one mother.

(6) **Many-to-Many (M:N) :** An occurrence of object A can relate to one or many occurrences of object B and an occurrence of B can relate to only one or many occurrences of A. E.g. an uncle can have many nieces and a niece can have many uncles.

Cardinality defines the maximum number of objects that can participate in a relationship. It does not tell whether or not a data object must participate in the relationship.

Modality : If a particular relationship is optional or not needed then we say that the modality of that relationship is 0. The modality is 1 if an occurrence of the relationship is necessary.

Example : Consider 2 data objects Patient and Doctor. The relationship between the two data objects is *Treats.* A doctor needs a patient to treat, so the modality is 1 while it is not necessary for a patient to be treated by a doctor (he can be treated with home remedies too). So here the modality is 0.

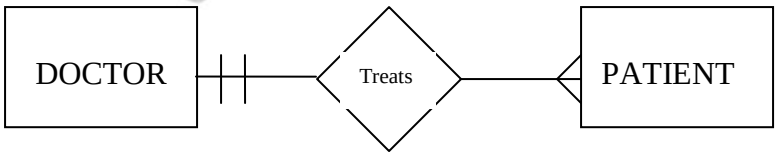
When we need to specify cardinality we use the symbols

- One = a line or dash |
- Many = crow's feet ⋲

To specify modality we use the symbols

- One = a line or dash |
- Zero = a circle o

The following ER diagram specifies cardinality and modality.



The symbols on the relationship line that is closest to the data object will denote cardinality and the next will denote modality.

Q.6 Explain Data Modeling and ER diagram with example.

Ans.: **Data Modeling :** It gives answers to questions regarding the data that is to be used in the application. We come to know the data objects, where they are stored, what is the relationship between objects, etc. Data modeling uses an Entity Relationship diagram to solve these questions. An Entity Relationship diagram will focus on all data that are entered, stored, transformed and produced within an application. The data model consists of three interrelated information – data objects, attributes that describe the data objects and relationships that connect data objects to one another.

Data Objects : A data object is something that has a number of different properties or attributes and that can be understood by software. For example a person or a car can be viewed as data objects. Data objects are related to one another. E.g. **person** can *own* **car**, where the relationship *own* denotes a connection between **person** and **car**. A data object reflects only data and not the operation that can be done on that data.

Attributes : Attributes define the properties of a data object. They can be used to name an instance of the data object, describe the instance or make reference to another instance in another table (e.g. attribute Owner). One or more attributes that uniquely identifies one and only one instance of an entity is defined as an identifier or primary key. E.g. employee no is a primary key for an employee.

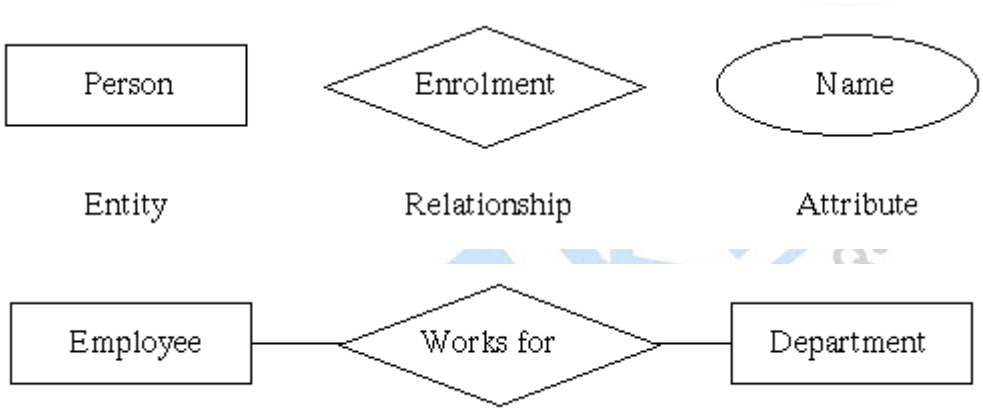
Relationships : Data objects are connected to one another in different ways. Consider two data objects – book and bookstore. A connection is established between book and bookstore because the two objects are related.

Entity – Relationship Diagrams : The object-relationship pair can be represented graphically using an ER diagram. An entity represents an object. Examples: a computer, an employee, a song, a mathematical theorem. Entities are represented as rectangles.

A relationship captures how two or more entities are related to one another. Examples: an *owns* relationship between a company and a computer, a *supervises*

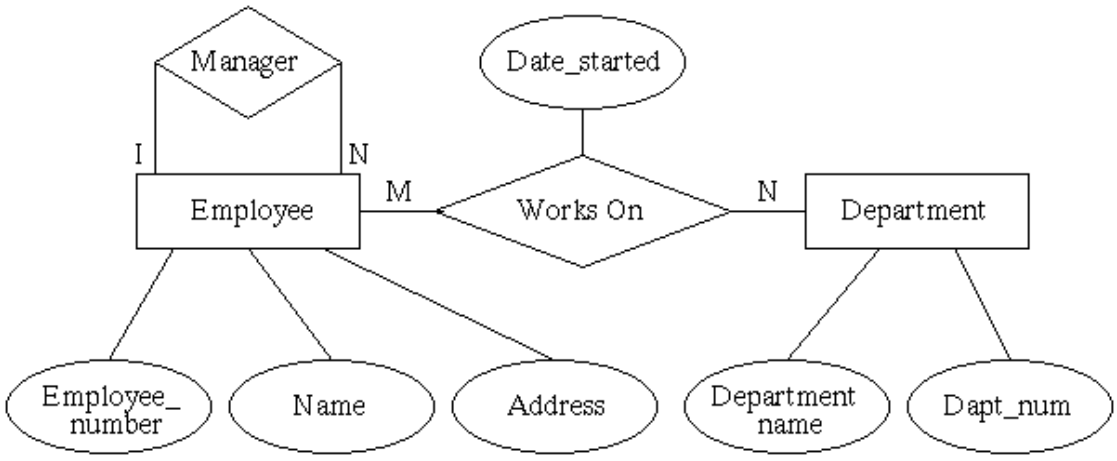
relationship between an employee and a department, a *performs* relationship between an artist and a song. Relationships are represented as diamonds, connected by lines to each of the entities in the relationship.

Entities and relationships can both have attributes. Examples: an employee entity might have an employee ID number attribute; the *proved* relationship may have a *date* attribute. Attributes are represented as ellipses connected to their entity by a line.



A Simple E-R Diagram

The following E-R diagram gives the attributes as well.



An E-R Diagram with Attributes

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Chapter-6

Feasibility Study

Feasibility study in the analysis phase is conducted to find the best candidates system out of the all alternative candidate system. Here we need to consider the economic,

behavioral and technical feasibility in the system development. The project team is formed to develop system flowchart that identify the characteristics of system, evaluate the performance of each system, weigh the system performance and then finally select the best candidate system out of alternative systems.

Q.1 What is Feasibility? Describe the different types of Feasibility.

Ans.: Feasibility is the determination of whether or not a project is worth doing. The process followed in making this determination is called feasibility study. A feasibility study is carried out to select the best system that meets performance requirements. When conducting feasibility study, an analyst can consider 7 types of feasibility:

- **Technical Feasibility:** It is concerned with specifying the equipment and the computer system that will satisfy and support the proposed user requirements. Here we need to consider the configuration of the system which tells the analyst how many work stations are required, how the units are interconnected so that they can operate and communicate smoothly.
- **Operation Feasibility:** It is related to human organizational aspects. The points to be considered here are – what changes will be brought with the system?, what new skills will be required?, do the existing staff members have these skills and can they be trained?
- **Economic Feasibility:** It is the most frequently used technique for evaluating a proposed system. It is also called Cost/Benefit Analysis. It is used to determine the benefits and savings that are expected from the proposed system and compare them with the costs. If benefits are more than the cost, the proposed system is given an OK.
- **Social Feasibility:** It is a determination of whether the proposed system will be acceptable to the people or not. It finds out the probability of the project being accepted by the group of people who are directly affected by the changed system.
- **Management Feasibility:** It is a determination of whether the proposed system is acceptable to the management of the organization. The project may be rejected, if the management does not accept the proposed system.

- **Legal Feasibility:** It is a determination of whether the proposed project is under legal obligation of known Acts, Statutes, etc.
- **Time Feasibility:** It is a determination of whether the project will be completed within a specified time period. If the project takes too much time, it is likely to be rejected.

Q.2 What are the steps in feasibility analysis?

Q.3 what is Cost/Benefit Analysis? Explain its procedure.

Ans.: The costs associated with the system are expenses or losses arising from developing and using a system. But the benefits are the advantages received from installing and using this system. Cost/Benefit analysis is a procedure that gives a picture of the various costs, benefits and rules associated with a system. The determination of costs and benefits is done in the following steps:

(5) Identify the costs and benefits of a project.

(6) Categorize the costs and benefits for analysis: The different categories of costs and benefits are :

  (a) Tangible or Intangible

  (b) Direct or Indirect

  (c) Fixed or Variable

(7) Select a method of evaluation: When all data is identified and categorized, the analyst must select a method of evaluation. The methods are :

  (a) Net Benefit analysis

  (b) Present value analysis

  (c) Net Present value

  (d) Payback analysis

  (e) Break even analysis

  (f) Cash flow analysis

(8) Get the result of analysis and Take action.

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Unit-7
Input/output and Form Design

Introduction:

We define systems design as the process of developing specification for a candidate system that meet the criteria established in system analysis.
The Major step in a design is the preparation of input and the design of output reports in a form acceptable to the user.

Q.1 Explain Input Design.

Ans.: Inaccurate input data are the most common cause of errors in data processing. Errors entered by data entry operators can be controlled by input design. Input design is the process of converting user-originated inputs to a computer based format. In the system design phase, the expanded data flow diagram identifies logical data flows, data stores, sources and destinations. The goal of designing input data is to make data entry as easy, logical and free from errors as possible. In entering data, operators need to know the following:

(1) The allocated space for each field.

(2) Field sequence, which must match that in the source document.

(3) The format in which data fields are entered.

Source data are input into the system in a variety of ways, the media and devices used are Punch cards, Key-to-diskette, MICR, OCR, Optical bar code readers, CRT screens, etc. We also input data online. The three major approaches for entering data into the computer are menus, formatted forms and prompts. Menu is a selection list that simplifies computer data access or entry. Instead of remembering what to enter, the user chooses from a list of options and types the option letter associated with it. A formatted form is a preprinted form or a template that requests the user to enter data in appropriate locations. It is a fill-

in-the-blank type form. In prompt the system displays one inquiry at a time, asking the user for a response.

Q.2 Explain Output Design.

Ans.: Computer output is the most important and direct source of information to the user. Efficient, intelligible output design should improve the systems relationships with the user and help in decision making. A major form of output is a hard copy from the printer. Printouts should be designed around the output requirements of the user. The output devices to consider depend of factors such as compatibility of the device with the system, response time requirements, expected print quality and number of copies needed. The media devices used are MICR, Line, matrix and daisy wheel printers, Computer output microfilm, CRT screen, graph plotters and audio response. The output design considerations are as under :

(1) Give each output a specific name or title

(2) Provide a sample of the output layout, including areas where printing may appear and the location of each field

(3) State whether each output field is to include significant zeros, spaces, etc.

(4) Specify the procedure for proving the accuracy of output data.

In online applications, information is displayed oin the screen. The layout sheet for displayed output is similar to the layout chart used for designing input.

Q.3 Describe File Structure and Organization.

Ans.: Given that a file consists, generally speaking, of a collection of records, a key element in file management is the way in which the records themselves are organized inside the file, since this heavily affects system performances ad far as record finding and access. Note carefully that by ``organization'' we refer here to the *logical* arrangement of the records in the file (their ordering or, more generally, the presence of ``closeness'' relations between them based on their content), and not instead to the physical layout of the file as stored on a storage

media, To prevent confusion, the latter is referred to by the expression ``record blocking'', and will be treated later on.

Choosing a file organization is a design decision, hence it must be done having in mind the achievement of good performance with respect to the most likely usage of the file. The criteria usually considered important are :

(5) Fast access to single record or collection of related recors.

(6) Easy record adding/update/removal, without disrupting.

(7) Storage efficiency.

(8) Redundance as a warranty against data corruption.

Needless to say, these requirements are in contrast with each other for all but the most trivial situations, and it's the designer job to find a good compromise among them, yielding and adequate solution to the problem at hand. For example, easiness of adding. is not an issue when defining the data organization of a CD-ROM product, whereas fast access is, given the huge amount of data that this media can store. However, as it will become apparent shortly, fast access techniques are based on the use of additional information about the records, which in turn competes with the high volumes of data to be stored.

Sequential : This is the most common structure for large files that are typically processed in their entirety, and it's at the heart of the more complex schemes. In this scheme, all the records have the same size and the same field format, with the fields having fixed size as well. The records are sorted in the file according to the content of a field of a scalar type, called ``key''. The key must identify uniquely a records, hence different record have diferent keys. This organization is well suited for batch processing of the entire file, without adding or deleting items: this kind of operation can take advantage of the fixed size of records and file; moreover, this organization is easily stored both on disk and tape. The key ordering, along with the fixed record size, makes this organization amenable to dicotomic search. However, adding and deleting records to this kind of file is a tricky process: the logical sequence of records typically matches their physical layout on the media storage, so to ease file navigation, hence adding a record and maintaining the key order requires a reorganization of the whole file. The usual solution is to make use of a ``log file'' (also called ``transaction file''), structured

as a pile, to perform this kind of modification, and periodically perform a batch update on the master file.

Indexed Sequential : An index file can be used to effectively overcome the above mentioned problem, and to speed up the key search as well. The simplest indexing structure is the single-level one: a file whose records are pairs key-pointer, where the pointer is the position in the data file of the record with the given key. Only a subset of data records, evenly spaced along the data file, are indexed, so to mark intervals of data records.

A key search then proceeds as follows: the search key is compared with the index ones to find the highest index key preceding the search one, and a linear search is performed from the record the index key points onward, until the search key is matched or until the record pointed by the next index entry is reached. In spite of the double file access (index + data) needed by this kind of search, the decrease in access time with respect to a sequential file is significant. Consider, for example, the case of simple linear search on a file with 1,000 records. With the sequential organization, an average of 500 key comparisons are necessary (assuming uniformly distributed search key among the data ones). However, using and evenly spaced index with 100 entries, the number of comparisons is reduced to 50 in the index file plus 50 in the data file: a 5:1 reduction in the number of operations. This scheme can obviously be hierarchically extended: an index is a sequential file in itself, amenable to be indexed in turn by a second-level index, and so on, thus exploiting more and more the hierarchical decomposition of the searches to decrease the access time. Obviously, if the layering of indexes is pushed too far, a point is reached when the advantages of indexing are hampered by the increased storage costs, and by the index access times as well.

Case studies:-

Partial source Document with check-off option

Recommended	Inefficient

Shirt size (check one)		Shirts(enter size)
Small	☐	
Medium	☐	
Large	☐	
X large	☐	

Form to fill information

Assignment:

c.) What flaws are there in the form?

d.) Develop an updated version of the form.

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Unit-8
Documentation

Introduction:

Documentation is one of the systems which are used to communicate, instruct and Record the information for any reference of operational papoose.

Q.1 what is documentation and its importance?

They are very useful for representing the formal flow of the present system. With the help of Documentation it is very easy to track the flow of the system's progress and they working of the system can be explained very easily.

It helps to provide the clear description of the work done so far. It is essential that the documents prepared must be updated on regular basis this will help to trace the progress of work easily. With appropriate and good documentation it is very easy to understand the how aspects of the system will work for the company where the system is to installed. It is also help to understand the type of data which will be inputted in the

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system and how the output can be produced.

After the system is installed, and if in case the system is not working properly it will be very easy for the administrator to understand the flow of data in the system with documentation which will help him/ her to correct the flaws and get the system working in no time.

Uses of Documentation

- It facilitates effective communication regarding the system between the technical and the non technical users.
- It is very useful in training new users. With a Good documentation new users can easily get acquainted with the flow of the systems.
- Documentation also helps the users to solve problems like trouble shooting even a non technical user can fix the problems.
- It plays a significant role in evaluation process.
- It not only helps to exercise a better control over the internal working of the firm, but it also external as well especially during audit.
- Documentations can help the manager to take better financial decisions of the organization.

Q.2 Describe the different types of Documentation.

Ans.: There are five types of documentation:

(6) **Program:** Before a program is developed, the systems analyst should provide the programmer with the required documentation. The logic in some programs is best described by a flowchart. Sometimes decision tables are also useful. The main responsibility in documentation is to provide enough information to enable future programmers to understand and make necessary changes. Since programmers do not retain their jobs for a very long time, it becomes necessary that there be some kind of documentation that will be useful for the new programmers who are assigned the same system.

(7) **Operations:** For smooth running of the system, the data entry operator must have complete knowledge about the job. The instructions must be in

a form that is easily accessible to the console operator and written in simple and understandable style.

(8) **User :** System users should have a manual that describes everything the users must know to do their job correctly. Users require two general type of information: complete details to handle everything the system processes, and an overall picture of the system.

(9) **Management :** The documentation required by management differs a lot from that required by users. The manual should enable management to perform three functions:

(a) Evaluate progress on the development of system.

(b) Monitor the existing systems.

(c) Understand the objectives and methods of the new and existing system.

(10) **Systems:** This manual document the complete life cycle of the system. If documents the results of the feasibility study, the team assigned, etc. It also documents the file specification, transaction specification and output specification.

MCQs

Set 1:-

1. Which of the following technical skills is essential for a system analyst?
   (a) Knowledge of networking
   (b) Knowledge of operating system
   (c) Problem solving approach
   (d) None of the above ( )

2. Which one of the following is not a Top Management function?
   (a) Planning

(b) Organizing
(c) Decision making
(d) Day to day operation ( )

3. An entity one of the following is not a Top Management functions?
(a) All entities are so same type
(b) May be of same type or may be of different type
(c) Both a and b
(d) Neither (a) nor (b) ( )

4. "SQL" stands for:
(a) Software Quality Accuracy
(b) Maybe same type or may be of different type
(c) Both a and b
(d) Neither a nor b ( )

5. A central repository of records is known as:
(a) Data warehousing (b) Client server system
(c) Data mining (d) Distributed System ( )

6. System Development Cycle is also known as:
(a) Problem solving cycle (b) Product life cycle
(c) Hardware cycle (d) Software cycle ( )

7. A computer which requests another computer is:
(a) Server
(b) Multiplexer
(c) Client
(d) None of the above ( )

8. System testing is an important par of:
(a) Model building
(b) Quality assurance
(c) Generating information
(d) None of the above ( )

9. Risk analysis includes:
(a) Manpower risk
(b) Technology risk
(c) Customer/user risk

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(d) Environment risk ( )

10. Deductive database and expert system are mainly used for:
    (a) Replacing the functionality of a real expert
    (b) Hypothesis testing
    (c) Knowledge discovery
    (d) All of the above ( )

11. Error and fraud in any computer system can be detected through:
    (a) Usage of password
    (b) Network security
    (c) Audit trails
    (d) None of the above ( )

12. Which is the characteristics of data in a DBMD?
    (a) Consistency (b) Security
    (c) Independence (d) All of the above ( )

13. Which tool is used for analysis of data flow:
    (a) Data flow diagram (b) Data dictionary
    (c) Flow chart (d) All of the above ( )

14. Storage of information in graphs video, voice is:
    (a) Multimedia (b) Cookies
    (c) Text file (d) All of the above ( )

15. Decision tables is:
    (a) table containing decision
    (b) methods
    (c) none of the various programming analysis tools
    (d) debugging tool ( )

16. A distinct object in a system is known is:
    (a) Degree
    (b) Attribute
    (c) Parameter
    (d) Entity ( )

17. An unstructured tool for information gathering can be:
    (a) prototyping (b) questionnaires

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(c) observation (d) all of the above ( )

18. .....is the process of collecting organizing, storing and maintaining complete historical record of programs.
(a) Documentation (b) Testing
(c) Debugging (d) None of the above ( )

19. Cost benefit analysis is performed during be:
(a) Analysis phase
(b) Design phase
(c) Implementation
(d) None of the above ( )

20. In terms of total software cost, maintenance costs appear to constitute about:
(a) 5%–20%
(b) 20% – 40%
(c) 40% – 80%
(d) 80% – 90% ( )

21. CASE is stand for:
(a) Computer Assisted Software Engineering
(b) Computer and Software Engineering
(c) Computer Aided Software Engineering
(d) None of the above ( )

22. Pseudo code is:
(a) Programmer (b) IBA
(c) User (d) System Analyst ( )

23. A system that groups a number of transaction for later processing is known is:
(a) Programmer
(b) IBA
(c) User
(d) System Analyst ( )

24. A person who analysis the way the system works and its problem is:
(a) Client server (b) On line system
(c) Real time system (d) Batch system ( )

25. Which of the following areas should be addressed while designing a system:

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(a) Problem domain (b) Human interface
(c) Task management (d) Data management ( )

26. Top level manager uses:
(a) Strategic information
(b) Tactical information
(c) Operational information
(d) None of the above ( )

27. Entities, attributes and relationship are associated with:
(a) Logical concept of data
(b) Physical concept of data
(c) Person of organization
(d) None of the above ( )

28. Prototyping aims at:
(a) End user understanding and approval
(b) Program logic
(c) Planning of data flow organization
(d) None of the above ( )

29. File conversion is part of:
(a) System cut over
(b) System design
(c) Day to day activity
(d) None of the above ( )

30. DSS role is:
(a) Trial and error search for solutions
(b) Planning
(c) Analyzing alternatives
(d) (a) (b) and (c) of the above ( )

31. Tangible benefits by their very nature, require:
(a) Subjective evaluation
(b) Quantifiable evaluation
(c) Feasible evolution
(d) None of the above ( )

32. The components that make up any system is known is:

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(a) Data
(b) Boundary
(c) Description
(d) Information ( )

33. In a DBMS two records types and their relationship are called:
(a) Schema (b) Segment
(c) Set (d) Database record ( )

34. Data integrity stands for:
(a) Validated data
(b) Data stored in different files showing consistency
(c) Data field integrated to provide summary
(d) None of the above ( )

35. Hashing procedure is used in:
(a) Random files
(b) Sequential files
(c) Indexed relationship, field and record type
(d) None of the above ( )

36. A DDL is:
(a) Establishes relationship, field and record type
(b) Helps maintaining data in database
(c) Create database
(d) None of the above ( )

37. Which of the following are tools of SASD?
(a) HIPO
(b) CASE
(c) DFD
(d) All of the above ( )

38. Which of the following is not part of SDLC?
(a) Audit
(b) Reliability
(c) Security
(d) None of the above ( )

39. .....means changing from one system to another:

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(a) Manipulations
(b) Conversion
(c) Requirement
(d) Designing ( )

40. The full form of CPM is:
(a) Critical path method
(b) Critical program methodology
(c) Computer program and maintenance
(d) Complicated path method ( )

Answer Key

1. (c)	2. (d)	3. (a)	4. (c)	5. (a)	6. (b)	7. (c)	8. (b)	9. (b)	10. (d)
11. (c)	12. d)	13. (d)	14. (a)	15. (c)	16. (d)	17. (c)	18. (a)	19. (a)	20. (c)
21. (c)	22. (c)	23. (d)	24. (d)	25. (a)	26. (a)	27. (a)	28. (a)	29. (b)	30. (d)
31. (a)	32. (a)	33. (c)	34. (b)	35. (a)	36. (c)	37. (d)	38. (c)	39. (b)	40. (a)

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Set 2:-

1. Which of the following technical skills is essential for a system analyst?
(a) Knowledge of networking
(b) Knowledge of operating system
(c) Problem solving approach
(d) None of the above ( )

2. The first step in SDLC is:
(a) Preliminary investigation and analysis
(b) System design
(c) Database Design
(d) None of the above ( )

3. Which one of the following is not a Top Management function?
(a) Planning

(b) Organizing
(c) Decision-making
(d) Day to day operation ( )

4. Data dictionary keeps details of the content of:
(a) Data Flow (b) Data stores
(c) Both a and b (d) Neither a nor b ( )

5. Structured programming involves:
(a) Functional modularization (b) Localization of error
(c) Decentralized programming (d) All of the above ( )

6. Tangible benefits by their very nature, require:
(a) Subjective evaluation (b) Quantifiable evaluation
(c) Feasible evaluation (d) None of the above ( )

7. An entity set of ER-Diagram, is a set of entities.
(a) All entities are of same type
(b) May be of same type or may be of different type
(c) Both a and b
(d) Neither a nor b ( )

8. "SQA" stands for:
(a) Software Quality Accuracy
(b) Software Quality Assistant
(c) Software Quality Assurance
(d) None of the above ( )

9. A set of predefined steps for building a systems is :
(a) Linear cycle
(b) Water full cycle
(c) Both a and b
(d) None of the above ( )

10. The full form of CPM is:
(a) Critical path methods
(b) Critical program methodology
(c) Computer program and maintenance
(d) Complicated path method ( )

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11. A central repository of records is known as:
    (a) Data warehousing
    (b) Client server system
    (c) Data mining
    (d) Distributed system ( )

12. System development cycle is also known as:
    (a) Problem solving cycle (b) Product life cycle
    (c) Hardware Cycle (d) Software cycle ( )

13. A method to illustrate how data flows in a system is known as:
    (a) Data flow diagram (b) Pseudo-code
    (c) Decision-support systems (d) None of the above ( )

14. A distinct object in a system is known as:
    (a) Degree (b) Attribute
    (c) Parameter (d) Entity ( )

15. A diagram that shows the inputs and outputs of a system is known as:
    (a) Document flow diagram (b) context diagram
    (c) Process diagram (d) None of the above ( )

16. A computer which requests another computer is:
    (a) Server
    (b) Multiplexer
    (c) Client
    (d) None of the above ( )

17. A step in the development process is :
    (a) Set (b) Subset
    (c) Break (d) Phase ( )

18. System testing in an important part of:
    (a) Model building (b) Quality assurance
    (c) Generating information's (d) None of the above ( )

19. Adapting an object for use in an application is known is:
    (a) conversation
    (b) Data mining
    (c) Collaboration

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(d) Customization ( )

20. The detailed study of the present system is referred to as:
(a) System planning
(b) System analysis
(c) Feasibility study
(d) System design. ( )

21. Management is linked to information by:
(a) Decision (b) Data
(c) Both a and b (d) Neither a nor b ( )

22. Which of the following is a tactical decision?
(a) Diversification (b) Data
(c) Both a and b (d) Neither a nor b ( )

23. Waterfall model follows;
(a) systematic approach
(b) Sequential approach
(c) Both a and b
(d) None of the above ( )

24. When the customer wants quick delivery, which model is best suited?
(a) Prototype model (b) Waterfall model
(c) DSDM (d) None of the above ( )

25. LOC stands for:
(a) Line of code (b) Label of code
(c) Both a and b (d) None of the above ( )

26. Tools used in requirements are:
(a) Prototypes
(b) Use case
(c) Data flow diagram
(d) Transition process diagram ( )

27. Which of the following is not an element in the physical DFD?
(a) Internal/External entity
(b) Data flows
(c) Processors

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(d) Flowchart ( )

28. A DFD is:
(a) Mainly used at the system specification stage
(b) The primary output of the system specification stage
(c) The modern version of a flowchart
(d) None of the above ( )

29. A software design description document only includes;

(a) Data dictionary
(b) ER diagram
(c) DFD
(d) All of the above ( )

30. Same types of attribute is called:
(a) Attribute set (b) Domain
(c) Entity set (d) None of the above ( )

31. Once the software is installed and deployed it enters the:
(a) Implementation phase
(b) System design phase
(c) Maintenance
(d) None of the above ( )

32. Risk analysis includes:
(a) Manpower risk
(b) Technology risk
(c) Customer/user risk
(d) Environment risk
(e) All of the above ( )

33. Which set of properties that should be specified as a part of an architectural design?
(a) Structured Properties (b) Extra-functional properties
(c) Families of related systems (d) All of the above ( )

34. FTR stands for:
(a) Formal Testing Review
(b) Formal Technical Review

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(c) Formal Technical Relation
(d) None of the above ( )

35. Validation testing includes:
(a) Recovery testing
(b) Stress testing
(c) Alpha and Beta testing
(d) Security testing ( )

36. System testing includes:
(a) Recovery testing
(b) Stress testing
(c) Security testing
(d) All of the nonve ( )

37. Project manager is responsible for:
(a) Successful execution of the implementation phase
(b) Accomplishing assigned tasks
(c) Preparing soliciting document
(d) None of the above ( )

38. Client-server database consists of:
(a) Client application
(b) Database server
(c) Middleware
(d) All of the above ( )

39. Which of the following is false?
(a) Data mining support massive data collection
(b) Data mining support powerful multiprocessor computer
(c) Data mining support, data mining algorithms
(d) None of the above ( )

40. Deductive database and expert systems are mainly used for:
(a) Replacing the functionality of a real expert
(b) Hypothesis testing
(c) Knowledge discovery
(d) All of the above ( )

Answer Key

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1. (b)	2. (c)	3. (d)	4. (b)	5. (c)	6. (c	7. (c)	8. (c)	9. (c)	10. (b)
11. (a)	12. a)	13. (b)	14. (c)	15. (d)	16. (d)	17. (c)	18. (b)	19. (c)	20. (a)
21. (b)	22. (c)	23. (a)	24. (b)	25. (d)	26. (a)	27. (b)	28. (a)	29. (a)	30. (c)
31. (b)	32. (c)	33. (a)	34. (a)	35. (b)	36. (d)	37. (a)	38. (c)	39. (a)	40. (b)

Set 3:-

1. Which is the system development approach?
   (a) Data modeling (b) Function oriented
   (c) Process modeling (d) None of these ( )

2. Which is the characteristic of data in a DBMS?
   (a) Consistency
   (b) Security
   (c) Independence
   (d) All of the above ( )

3. Error and fraud in any computer system can be detected through:
   (a) Usage of password (b) Network security
   (c) Audit trails (d) None of the above ( )

4. What is decision table?
   (a) A graphic method for describing the logic of decisions
   (b) Data dictionary
   (c) Flow chart
   (d) None of these ( )

5. Which tool is used for analysis of data flow?
   (a) Data flow diagram (b) Data dictionary
   (c) Flow chart (d) All of the above ( )

6. How many types of relationships can be defined between two or more entities.

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(a) 2 (b) 3
(c) 1 (d) None of the above ( )

7. The characteristic of data in a database is:
(a) Shared
(b) Security
(c) Persistence
(d) All of the above ( )

8. The rectangular is used in DFD:
(a) Read/write data
(b) Processing
(c) Decision-making
(d) None of these ( )

9. Which is a desirable feature of good quality design?
(a) Flexible
(b) Portable
(c) Secure
(d) All of the above ( )

10. Which tool is used for analysis of data flow?
(a) Data dictionary
(b) Structured English
(c) Decision Tables
(d) None of these ( )

11. A person who analyze the way the system works and its problems is:
(a) Programmer
(b) DBA
(c) User
(d) System analyst ( )

12. Storage of information in graphs, video, voice etc. is:
(a) Multimedia
(b) Cookies
(c) Text file
(d) None of the above ( )

13. The sequence of steps followed in a system study is :

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(a) Problem definition, system design, system analysis, programming and implementation
(b) Problem definition, system analysis, programming and implementation
(c) System analysis, system design and system implementation
(d) Problem, definition, system analysis, system design, programming analysis, program preparation and implementation ( )

14. Decision table is:
(a) A table containing decisions
(b) A method to analyze how to get decision
(c) One of the various programming analysis tools
(d) A debugging tool ( )

15. Decision tables are made prior to making a/an:
(a) Flowchart (b) Algorithm
(c) Program (d) Task analysis ( )

16. We task the help of flowcharts:
(a) To decide the sequence of steps involved in finding the solution
(b) As an addition to making algorithm
(c) To prepare decision tables
(d) None of the above ( )

17. A district object in a system is known is:
(a) Degree (b) Attribute
(c) Parameter (d) Entity ( )

18. A system that groups a number of transaction for later processing is known is:
(a) Client Server (b) Batch system
(c) Online system (d) Real time system ( )

19. Which of the following items are discussed during the system implementation phase of the application:
(a) Program specification
(b) Software specification
(c) Software maintenance
(d) All of the above ( )

20. A system flow chart describes the:
(a) details of each program module

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(b) line diagram for particular program
(c) data files and operations and decision for a particular program
(d) sequence of operations techniques is used to simplify defining problem ( )

21. Which of the following techniques is used to simplify defining problems by both system analysis and programmers:
(a) Documentation
(b) Decision tables
(c) Sub-routine
(d) Decision instruction ( )

22. The normal starting point of any system design is to:
(a) determine the input requirement
(b) determine the output requirement
(c) establish data entry procedures
(d) determine data entry requirement ( )

23. Which of the following is not true about distributed processing:
(a) They are modular
(b) They are more reliable
(c) Maintenance costs are high
(d) Response is slow ( )

24. Which of the following technical skills is essential for a system analyst:
(a) Knowledge of networking
(b) Knowledge of operating system
(c) Problem solving approach
(d) None of the above ( )

25. An unstructured tools for information gathering can be:
(a) prototyping
(b) questionnaires ( )

26. The components of a distributed system are connected by a :
(a) Multiplexer
(b) Communication controller
(c) Network
(d) Switcher ( )

27. Entities attributes and relationships are associated with:

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(a) Logical concept of data
(b) Physical concept of data
(c) Person of an organization
(d) None of the above ( )

28. Prototype is:
(a) minimodel of the existing system
(b) minimodel of tthe proposed system
(c) working model of the existing system
(d) none of the above ( )

29. .....is a collection of computer based information that is critical to successful execution of enterprise initiatives.
(a) data mining
(b) data warehouse
(c) both a and b
(d) None ( )

30. A/An.....is a set of components that work together to accomplish one or more common goals.
(a) System
(b) Flow chart
(c) Algorithm
(d) None ( )

31. The feasibility report consists of:
(a) General specification for the new system
(b) Economic analysis of costs and justification for expenditure
(c) Technical considerations
(d) All of the above ( )

32. A.....is a structured repository of data.
(a) Data flow diagram
(b) Data dictionary
(c) Structure chart
(d) None ( )

33. An association among entities is caused a :
(a) Attribute
(b) Relationship
(c) Redundancy

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(d) None ( )

34. .....are a fundamental tool of a structured desing.
(a) Structure charts
(b) Data structure diagrams
(c) Case tools
(d) None of the above ( )

35. Which of the following appropriately explains the desirable characteristic of a good system design?
(a) Modular approach
(c) Proper documentation
(a) Neither a nor b
(c) Both a and b ( )

36. Design specifications do not normally include:
(a) Output requirements
(b) Input and storage requirements
(c) Control Provisions
(d) Blueprints showing the layout hardware ( )

37. .....is a network that describes data flows and transformations throughout a system:
(a) Data flow diagram
(b) Data dictionary
(c) Structure charts
(d) None ( )

38. In development of an applications systems, which accesses data under a DBMS, the user vies the database as a:
(a) Group of files
(b) Logical Structure
(c) Random storage structure
(d) None of the above ( )

39. A set of prerecorded instructions executed by a computer is called the:
(a) Action

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(b) Hardware
(c) Program
(d) None of these ( )

40. .....is the process of collecting, organizing, storing and maintaining a complete historical record of programs.
(a) Documentation
(b) Testing
(c) Debugging
(d) None of these ( )

Answer Key

1. (b)	2. (d)	3. (c)	4. (c)	5. (a)	6. (b)	7. (d)	8. (d)	9. (b)	10. (b)
11. (d)	12. (a)	13. (a)	14. (c)	15. (b)	16. (b)	17. (c)	18. (a)	19. (c)	20. (d)
21. (b)	22. (d)	23. (a)	24. (a)	25. (a)	26. (c)	27. (d)	28. (c)	29. (b)	30. (c)
31. (d)	32. (a)	33. (a)	34. (b)	35. (b)	36. (a)	37. (c)	38. (c)	39. (b)	40. (a)

Set 4:-

1. The basic objective of system analysis is to:
(a) Understand computer hardware by opening the system unit
(b) Train manager in mathematical analysis
(c) Run simulation program
(d) Understand a current system and modify it in same way ( )

2. A zero level! DFD describes:
(a) Overview of processes, inputs and outputs
(b) Fully blown by system design
(c) The system design can not be spilt further

(d) None of these ( )

3. Which of the following is not part of the SDLC?
   (a) Feasibility study
   (b) System design
   (c) Unit testing
   (d) None of these ( )

4. Cost-benefit analysis is performed during the:
   (a) Analysis phase
   (b) Design phase
   (c) Implementation phase
   (d) None of these ( )

5. Which of the following is most likely to be used to describe conditional logic?
   (a) Decision table
   (b) Data flow diagram
   (c) Structured English
   (d) All of the above ( )

6. Which of the following technical skills are essential for a system analyst?
   (a) Knowledge of networking
   (b) Knowledge of operating system
   (c) Problem solving approach
   (d) None of these ( )

7. The entity-relationship diagram:
   (a) Depicts how data is transformed as it moves through the system
   (b) Depicts relationship between data object
   (c) Describes how the system behaves as a consequences of external events
   (d) None of these ( )

8. The data dictionary consists of:
   (a) Definition of all data elements in data flow diagram
   (b) Process Specifications
   (c) Key field of the database
   (d) None of these ( )

9. The system design:
   (a) Documents the user requirement

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(b) Defines the architecture of the system
(c) Is carried out before the systems design
(d) None the these ( )

10. In terms of total software cost, maintenance costs appear to constitute about:
(a) 5% – 20%
(b) 20% – 40%
(c) 40% – 80%
(d) 80% – 90% ( )

11. Risk analysis is a part of which software development process:
(a) Waterfall model
(b) Prototype model
(c) Spiral model
(d) None of these ( )

12. In which phase of SDLC, the modules are tested against specification produced during design for the module?
(a) Analysis phase
(b) Design phase
(c) Coding Phase
(d) None of these ( )

13. How many types of relationship can be defined between two or more entities?
(a) 2 (b) 3
(c) 1 (d) None of these ( )

14. An unstructured tool for information gathering can be:
(a) Prototyping
(b) Questionnaires
(c) Observation
(d) All of these ( )

15. A knowledge is being discovered from a large volume of data, the method used is known is:
(a) Data warehousing (b) Data mining
(c) Data counting (d) None of these ( )

16. The type of organization, in which a single index for each key type exists and records are not necessarily stored in particular sequence:

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(a) Index sequential method
(b) Inverted list organization
(c) Chaining
(d) None of these ( )

17. Loss of data integrity implies that data is:
(a) Inconsistent (b) Repeated
(c) Outdated (d) None of these ( )

18. A CASE is:
(a) Computer assisted software engineering
(b) Computer and software engineering
(c) Prepare, connect, execute, fetchrow, finish, disconnect
(d) None of these ( )

19. A support system that is related to the higher level of management is:
(a) Data support system
(b) Digital support system
(c) Decision support system
(d) None of these ( )

20. The main advantage of normalized relations in relations DBMS is taht they:
(a) Are highly secure
(b) De not suffer from anomalies during deleted and update operations
(c) Occupy minimal storage
(d) All of the above ( )

21. A diagram that shows the input of output of a system is known as:
(a) Document flow diagram
(b) Process diagram
(c) Context diagram
(d) None of these ( )

22. Which of the following are tools of SASD?
(a) HIPO
(b) Case
(c) DFD
(d) All of the these ( )

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23. Which of the following appropriately explains the desirable characteristic of a good system design?
    (a) Modular approach
    (b) Proper documentation
    (c) Neither a nor b
    (d) both a and b ( )

24. A typical data processing context, where master files are updated to produce desired output, is known is:
    (a) Validation checking
    (b) Transaction processing
    (c) Normalization process
    (d) None of these ( )

25. Whether a proposed system can provide right information for the organizations personnel, falls under the study of:
    (a) Economic feasibility
    (b) Operational feasibility
    (c) Technical feasibility
    (d) All of these ( )

26. Stub is met within the context of:
    (a) Data communication
    (b) Testing of module
    (c) Random access
    (d) None of these ( )

27. Entities, attributes and relationship are associated with:
    (a) Logical concept of data
    (b) Physical concept of data
    (c) Persons of an organization
    (d) None of these ( )

28. Decision tables link conditions and:
    (a) Tables
    (b) Programs
    (c) Actions
    (d) None of these ( )

29. Pseudo code is:

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(a) False logic
(b) Programming aid
(c) Both a and b
(d) Neither a nor b ( )

30. Design specification do not normally include:
(a) Output requirements
(b) Input and storage requirements
(c) Control provisions
(d) Blueprints showing the layout of hardware ( )

31. The sequence of steps of following in a system study is:
(a) Problem definition, system design, system analysis, programming and implementing
(b) Problem definition, system design, system analysis, programming and implementing
(c) System analysis system design and system implementation
(d) Problem definition, system analysis, system design, programming and implementing ( )

32. The phase of system development associated with creation of test data is:
(a) System analysis
(b) Physical design
(c) System acceptance
(d) Logical design ( )

33. Prototype is a :
(a) Minimodel of the existing system
(b) Minimodel of the proposed system
(c) Working model of the existing system
(d) None of these ( )

34. In development of an application system, which accesses data under a DBMS, the user views the database as a:
(a) Group of files
(b) Logical structure
(c) Random storage structure
(d) None of these ( )

35. A distinct object in a system in known is:

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(a) Degree
(b) Attribute
(c) Parameter
(d) Entity ( )

36. A person who analysis the way the system works and its problem is:
(a) Programmer
(b) DBA
(c) User
(d) System analyst ( )

37. A system that groups a number of transaction for later processing is known is:
(a) Client Server
(b) Post on Point
(c) Post Office Protocol
(d) Post of Protocol ( )

38. .....is an application layer protocol that establishes, maintains and terminates a multimedia session.
(a) SIP
(b) RTCP
(c) DCT
(d) JPEG ( )

39. <Frameset Cols = "33%, 33%, 33%">
(a) Divides the browser screen into three equal horizontal sections
(b) Divides the browser screen into three equal vertical section
(c) Divides the browser screen into three horizontal sections
(d) Divides the browser screen into three vertical section ( )

40. A.....can forward or block packets based on the information in the network layer and transport layer headers.
(a) Proxy farewell (b) Packet-filter fire well
(c) Message Digest (d) Private Key ( )

Answer Key

1. (c)	2. (b)	3. (b)	4. (d)	5. (d)	6. (d)	7. (b)	8. (c)	9. (b)	10. (a)

11. (b)	12. (d)	13. (d)	14. (d)	15. (b)	16. (b)	17. (b)	18. (d)	19. (c)	20. (a)
21. (b)	22. (b)	23. (a)	24. (a)	25. (c)	26. (c)	27. (a)	28. (d)	29. (a)	30. (a)
31. (d)	32. (a)	33. (c)	34. (b)	35. (d)	36. (c)	37. (c)	38. (b)	39. (d)	40. (b)

Set 5:-

1. Which of the following is supported in Java?
   (a) Operator overloading
   (b) Pointers
   (c) Multiples Inheritance
   (d) Conditional Operator ( )

2. Which of the following is not a characteristic of HTTP?
   (a) Stateless protocol
   (b) Connection oriented
   (c) Object-oriented protocol
   (d) None of the above ( )

3. HTTP is a .....layer protocol:
   (a) Network
   (b) Transport
   (c) Application
   (d) Presentation ( )

4. A periodic signal completes one cycle in 0.001 seconds. What is the frequency?
   (a) Get
   (b) Post
   (c) Find
   (d) Put ( )

5. Which of the following is true with respect to cookies?
   (a) They allow Microsoft to look at your hard driver
   (b) They taste yummy and best served with milk
   (c) They serve as the virtual machine to run Java applets

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(d) They allow server programs to store and retrieve info on the client side ( )

6. Dynamic HTML can:
   (a) Create a ticker that automatically refreshes its content
   (b) Create 3 - D Elements which can overlap
   (c) Animate text and images without an animated gif file
   (d) All of the above ( )

7. Which of the following is not internet security requirement?
   (a) Protecting confidentiality of private information
   (b) Preventing unauthorized modification information
   (c) Counting the number of customers accessing the internet
   (d) Presenting the availability of system resources ( )

8. When a person uses a regular modem to make a connection to an internet service provider through POTS, the data travels over a:
   (a) Dedicated circuit
   (b) Dialed circuit
   (c) ISDN circuit
   (d) VPN circuit ( )

9. Mobile nodes are assigned:
   (a) Three IP addresses
   (b) Two IP address
   (c) One IP address
   (d) None of the above ( )

10. Which of the following is not an attribute of the <TR> tag?
   (a) ALIGN (b) STYLE
   (c) CHR (d) VALIGN ( )

11. Consider the following sets A and B:
   AISMTP, HTTP, FTP, TELNET, NNTP, UUCP
   B {Remote login, News groups, Webpages, Email, File upload}
   Which of the following illustrate the best combinations of an elements of a with an element of B?
   (a) {SMTP-News group, HTTP-Web Pages, FTP-Email TELNET. File uplaod, NNTP-Remote Logn}
   (b) {SMTP-WebPages, HTTP-Newsgroups, FTP-File upload, TELNET- Remote login}

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(c) SMTP-Email, HTTP-WebPages, TP-File upload, TELNET-Remote login, NNTP-Newsgroups}
(d) {SMTP-Email, HTTP,File upload, FTP-Newsgroups, TELNET-Remote login}
( )

12. Consider the following JavaScript code line document write (7/2) identify the correct statement (s) from among the following statement:
(a) The output is 7/2
(b) The output is 3
(c) This output is 3.5
(d) The java script code produces an error message ( )

13. Which of the following is a correct statement?
(a) JavaScript is a strongly typed language
(b) DOM stands for document object model
(c) The java script function prompt ( ) can be used to display a confirmation dialog box ( )
(d) The java script exist statement can be used in return a result from a function.

14. In HTML, which pair of tags is used to define a table row and table cell respectively?
(a) TH, TR
(b) TD, TR
(c) TR, TH
(d) TR, TD ( )

15. http://www.google.com/images/logo.gif is a URL, Then
(a) http://www.google.com/images/is the pathname where the file logo.gif is stored
(b) google.com is the internet domain name of the server where the file logo.gif is stored
(c) www.google.com is the internet domain name of the server where the file logo.gif is stored
(d) The above URL is a relative URL ( )

16. MIME stands for:
(a) Multipurpose Internet Mail Extension
(b) Multipurpose Internet Management Extension
(c) Multipurpose Internet Media Extension
(d) Multipurpose Internet Multimedia Extension ( )

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17. Which of the following environment variable must be used by a CGI script in order to produce a browser dependent output?
    (a) HTTP_ACCEPT
    (b) HTTP_USERAGENT
    (c) REQUEST_METHOD
    (d) HTTP_FROM ( )

18. Which of the following represent images, sound and vidio files respectively?
    (a) Myfile.mid, myfie,avi,myfile,gif
    (b) Myfile.gif,myfile,mid,myfile.avi
    (c) Myfile.gif,myfile.png,myfile.avi
    (d) Myfile.avi,myfile,gif.myfile.mid ( )

19. A linked page opens is new window when target property of anchor tag is set to:
    (a) _blank
    (b) _parent
    (c) _child
    (d) _mainframe ( )

20. Select the odd one:
    (a) <font>
    (b) FTP
    (c) <title>
    (d) <> ( )

21. <Frameset Rows="33%, 33%, 33%>
    (a) Divides the browser screen into three equal horizontal sections
    (b) Divides the browser screen into three equal vertical sections
    (c) Divides the browser screen into three horizontal sections
    (d) Divides the browser screen into three vertical sections ( )

22. Which of the following is not Internet Related?
    (a) POP3
    (b) FTP
    (c) x-400
    (d) HTML ( )

23. Which of the following is a web-server?
    (a) Microsoft IE
    (b) Netscape Navigator

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(c) Opera
(d) IIS ( )

24. <Form> tag's.....attribute specifies the CGI Script to which the data should be submitted:
(a) Post
(b) Action
(c) methods
(d) get ( )

25. Which protocol cannot be used on the internet?
(a) IPX
(b) DNS
(c) POP3
(d) TCP ( )

26. What is the term for two modems establishing communication with each other?
(a) Interconnecting (b)Connecting
(c) Pinging (d)Handshaking ( )

27. Which of the following factors does impact the amount of bandwidth customer require to access the Internet over DSL?
(a) Type of application
(b) Length of user session
(c) Use of e-mail
(d) Necessity of web server to promote business information ( )

28. In JPEG image format, compression ratio of upto-can be achieved without losing image quality:
(a) 80 : 1
(b) 60 : 1
(c) 40 : 1
(d) 20 :1 ( )

29. Which of the following statement is not true?
(a) Analog modems are inexpensive
(b) ISDN difficult to install
(c) Leased lines are expensive
(d) Analog modems offer high speed access ( )

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30. Which of the following is not a Traditional internet access method?
    (a) Analog dial up modems
    (b) ISDN
    (c) Leased Lines
    (d) DSL ( )

31. Which of the following domain names would most likely use a country domain to resolve its IP address?
    (a) chal.at ae.fhda.edu (b) gsfe.nasa.gov
    (c) kenz.acct.sony.in (d) mae.eng.sony.com ( )

32. Which of the following is an address revolver in an internet?
    (a) DNS client
    (b) DNS Server
    (c) Host Machine
    (d) Root Server ( )

33. MPEG divides frames into three categories:
    (a) I-Frames, frames, B-Frames
    (b) I-Frames, A-Frames, B-Frames
    (c) I-Frames, U-Frames, B-Frames
    (d) I-Frames, T-frames, B-Frames ( )

34. Which of the following protocol is used to serve steaming audio/video?
    (a) SMTP
    (b) HHTP
    (c) FTP
    (d) RTSP ( )

35. JPEG encoding involves .....a process that reveals the redundancies in a block.
    (a) Blocking (b) The DCT
    (c) Quantization (d) Vectorization ( )

36. A client machine usually need.....to sent email:
    (a) Only SMTP
    (b) Only POP
    (c) Both SMTP and POP
    (d) None of the above ( )

37. Protocols for internet Telephony are:

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(a) SIP and H.323 (b) RSTP and SRTF
(c) RSTP and RTCP (d) None of the above ( )

38. .....is a device at the telephone company site that can packetize data to be sent to the ISP server.
(a) A SDLAM (b) An ADSL Modem
(c) A filter (d) A splitter ( )

39. A paired HTML tag ends with:
(a) <\tag_name> (b) </tag_name>
(c) <tag_name> (d) <tag_name/> ( )

40. An applet is:
(a) A stand alone java program
(b) An animation tool
(c) A java program run able only in a browser
(d) A server ( )

Answer Key

1. (d)	2. (c)	3. (c)	4. (b)	5. (d)	6. (d)	7. (c)	8. (a)	9. (b)	10. (c)
11. (c)	12. (c)	13. (b)	14. (d)	15. (a)	16. (a)	17. (b)	18. (b)	19. (a)	20.(b)
21. (a)	22. (c)	23. (d)	24. (c)	25. (b)	26. (d)	27. (c)	28. (d)	29. (d)	30. (a)
31. (c)	32. (b)	33. (a)	34. (d)	35. (c)	36. (a)	37. (a)	38. (b)	39. (b)	40. (c)

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Glossary

Activity That set of tasks which are organized and broken down into a set of procedures to accomplish a specific goal. The distinction between a sub-function and an activity is as much a matter of interpretation as it is a matter of scope.

Analysis The separation of an intellectual or substantial whole into its constituent parts for individual study. The stated findings of such a separation or determination.

Application The specific set of activities under analysis. An application may consist of one or more activities within a functional area, or it may include all activities within a functional area. In some cases the application may cross functional areas. In some firms an application is synonymous with a system.

Attribute An aspect, quality, or characteristic of either an entity or a relationship which describes it. An attribute may be a physical characteristic, such as size, weight, or color, or a locational attribute, such as place of residence or place of birth. It may be a quality such as level of a particular skill, educational degree achieved, or the dollar value of the items represented by the order.

Baseline An item or collection of items of a particular shape and form used as a reference. A baseline configuration is a reference point for evaluating modifications and enhancements and a starting point for making those changes. This baseline is normally considered the "official" version of an installed and operational Configuration Item.

Class A set, group, collection or configuration containing members having or believed to have at least one attribute or characteristic in common. To classify is to organize or arrange according to class or category.

Client/Server That combination of common use, sharable machines which provide a variety of services to a network of personal workstations know as clients. Server machines may be dedicated to providing file storage or peripheral device management (such as printers, scanners, etc.) services, or they may also function as personal workstations.

Computer Aided Software Engineering (CASE) also called Computer Aided Systems Engineering, Computer Assisted Software Engineering and Computer Assisted Systems Engineering. CASE products are collections of software tools assembled by a vendor to help the analyst, designer and developer to produce diagrams and models; analyze component relationships; produce code; manage component and model versions; produce reports; and to document the results of their analysis and design in narrative form.

Configuration A specific arrangement of items assembled for a particular purpose.

Data analysis That process by which the data requirements of a functional area are identified, element by element. Each data element is defined from a business sense, its ownership is identified, and users and sources of that data are identified. These data elements are grouped into records, and a data structure is created which indicates the data dependencies.

Data dictionary An automated tool for collecting and organizing the detailed information about system components. Data dictionaries maintain facilities to document data elements, records, programs, systems, files, users, and other system components. A dictionary will also have facilities to cross-reference all system components to each other.

Data element The lowest unit of meaningful information in an automated file or on a document. A data element may consist of numbers, letters, or a combination of both.

Encyclopedia An integral part of a CASE product and designed by the CASE tool vendor specifically to collect and organize the detailed information about the data and process model system components developed using the CASE tool components. CASE encyclopedias maintain facilities to document attributes, entities and relationships, functions and processes, screens and reports, data flows, data stores, missions, goals, objectives, critical success factors, users and organization structures, and other data and process model components. An encyclopedia will also have facilities to cross-reference all components of its data and process models. A specific vendor's encyclopedia cannot normally operate independently of its associated CASE tool.

Entity Any real person, place, or thing, or logical person, place, or thing which can be definitively described, and which is of immediate and/or ongoing interest to the firm as a whole or to some aspect of the firm. An entity may also be an idea, concept, or convenience.

Entity set All known or suspected variants of the singular entities which make up the global set. In the entity-relationship model, the entity set is treated as if it were synonymous with the individual entities which comprise it. That is, the set is treated as if each of its component entities is defined and behaves in a similar manner.

Facilities Management. The process whereby one firm (the contracting firm) enters into a fixed length contract with another (the contractor) where the contractor agrees to operate and maintain the contracting firm's information systems. The Contracting firm normally agrees to provide all or a specified part of the necessary Information Systems equipment and supplies, and the contractor provides its own employees and management. The contractor operates the contracting firm's equipment, on the contracting firm's premises. Some or all of the contractor's employees may be located on the contracting firm's premises.

File A group of records, in automated or document form, which relate to the same subject and which are used and manipulated in the same manner.

Function A series of related activities, involving one or more entities, performed for the direct or indirect purpose of fulfilling one or more missions or objectives of the firm, generating revenue for the firm, servicing the customers of the firm, producing the products and services of the firm, or managing, administering, monitoring, recording, or reporting on the activities, states, or conditions of the entities of the firm.

Graphic User Interface (GUI) The term given to that set of items and facilities which provide the user with a graphic means for manipulating screen data rather than being limited to character based commands. Graphic User Interface tool kits are provided by many different vendors and contain a variety of components including (but are not limited to) tools for creating and manipulating Windows, Menu Bars, Status Bars, Dialogue Boxes, Pop-Up Windows, Scroll Or Slide Bars, Icons, "Radio" Buttons, On-Line and Context Dependent Help Facilities. Graphic User Interface tool kits may also provide facilities for using a mouse to locate and manipulate on screen data and activate program components.

Integrated CASE (I-CASE) A collection of products designed to allow the tools contained within them to communicate with each other and to transfer analysis, design and development data between them. Thus the data modeling tool may share data with the process modeling tool and both will share data with the code generation tools. the measurement tools may collect data from both and both may support the testing tools. Rarely however, will one CASE product permit and facilitate the transfer of data from its storage facility to that of another CASE product. Thus once a design is begin in one CASE too it is difficult or in some cases impossible to transfer that design information to another CASE product with completely reentering all the information

Interview A formal face-to-face meeting, especially, one arranged for the assessment of the qualifications of an applicant, as for employment or admission.... A conversation, as one conducted by a reporter, in which facts, or statements are elicited from another.

Life cycle The course of developmental changes thorough which a project passes from its inception as a project request to the mature state as characterized by a stable production environment.. A progression through a series of differing stages of development.

Method A means or manner of procedure, a regular and systematic way of accomplishing something. An orderly and systematic arrangement. Procedures according to a detailed, logically ordered plan.

Methodology The system of principles, practices, and procedures applied to a specific branch of knowledge.

Metric - A standard of measurement. The term is most often used to identify things that will be measured rather than the measurement process or the individual readings or points. Some examples of metric might be: lines of code, number of phone calls, number of resignations, or number of tests.

Model A representation, either graphic, narrative, or a combination of both, of a physical or conceptual environment. A model must identify the major components of the environment, describe those components in terms of their major attributes, and depict the relationships between the components and the conditions under which the components exist and interact with each other.

Outsourcing. The process whereby one firm (the contracting firm) enters into a fixed length contract with another (the contractor) where the contractor agrees to operate and maintain the contracting firm's information systems. The Contractor firm agrees to buy all or a specified part of the contracting firms Information Systems equipment and supplies, and to hire as their own employees all or a specified part of the contracting firm's Information Systems employees.

Personal Computer (PC) - Any combination of processor, input device and output device designed for use by a single individual. Personal computers may also be called workstations. Personal computers may have a character orientation, a graphical orientation, may be connected to other personal computers, or may operate in a standaloness mode, and may or may not have connectivity to a mainframe. Personal computer software is normally characterized by an operating system which provides basic file access, management and display services and well as application scheduling and management.

Plan That sequence of activities which are to be followed. A plan states each task, the estimated time to complete it, the persons assigned to perform it, and any task-to-task dependencies. Plans are updated on a periodic basis with actual results, and new

estimates are determined. At any point, the plan should reflect actual progress and remaining work.

Platform The term used to distinguish between the different classes or sizes of computing machinery –mainframe, minicomputer and microcomputer (or personal computer or workstation), between the various operating systems on each machine, and in some cases between stand-alone machines and networked machines. In some cases the term platform is used to distinguish between one combination of machine and software and some other combination.

Procedure The specific steps which must be followed in order to accomplish a specific task or activity.

Process A sequence of related activities, or it may be a sequence of related tasks which make up an activity. These activities or tasks are usually interdependent, and there is a well-defined flow from one activity to another or from one task to another.

Program A sequence of instructions which may be followed by a computer to perform a specific task or tasks.

Prototype A model on which later stages or development is based or judged. Prototypes are usually primitive forms used to evaluate a design. Prototypes may or may not actually work.

Record A group of one or more data elements which are stored together and which represent information which relates to a common topic. A record may be automated, or it may be a business document.

Relationship An association, linkage, or connection, either real or suspected, between entities of the same or different set which describes their interaction, the dependence of one upon the other, or their mutual interdependence.

Repository A tool independent of both DBMS and CASE products designed to collect and organize all analysis and design information regardless of source. Repositories can collect information about the components of the data and process model components developed using the CASE tools, as well as that information collected about non-model Information systems components such as data elements, records, programs, systems, files, and users. Repositories maintain facilities to document attributes, entities and

relationships, functions and processes, screens and reports, data flows, data stores, missions, goals, objectives, critical success factors, users and organization structures, and other data and process model components.

Review A reexamination or reconsideration.. A retrospective view or survey. An inspection or examination with the intention of evaluating and correcting flaws or errors

Security The protection of the firm's records and resources from unauthorized access, modification, or other interference includes an analysis of ownership, access, modification, use, and a determination of what protective or restrictive measures must be taken to ensure adequate protection of the firm's files.

Standards The rules which must be followed in order to accomplish a specific activity or task. Standards are established to ensure that all work is performed in a uniform manner.

System A group of interacting, interrelated, or interdependent (business functions, processes, activities or) elements forming a complex whole .... a functionally related group of (business functions, processes, activities or) elements, for instance, a network of structures and channels, as for communications, travel, or distribution.

Systems analyst One who engages in the study of, and separation of, a group of interacting, interrelated, or interdependent (business functions, processes, activities or) elements forming a complex whole into its constituent parts for individual study.

Task The lowest unit of discrete work which can be identified. An activity may be composed of many tasks. Tasks are highly repetitive, highly formalized, and rigidly defined.

Users Business personnel in other areas of the firm who manage, supervise, or perform the direct and indirect operational, managerial, and administrative tasks of the firm. Users provide the impetus for the development of these systems, in many cases they fund the development and implementation process and provide for their ongoing operation, and in all cases they supply the policies, guidelines, business requirements, specifications, and background information about the particular area to be systematized and automated.

Best books to refer:-

3.) System analysis and Design by *Elias M. Awad*

4.) Systems Analysis and Design by *Kenneth E. Kendall*

Best web-sites to surf:-

4.) http://www.nos.org/htm/sad1.htm

5.) http://www.umsl.edu/~sauterv/analysis/analysis_links.html

6.) http://en.wikipedia.org/wiki/Systems_analysis

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