

EXERCISE

Q1. Select the best answer for the following MCQs.

- i. The first step in the system development life cycle is:**
 - a. Analysis
 - b. Design
 - c. Problem identification
 - d. Development and documentation

- ii. The organized process or set of steps that needs to be followed to develop an information system is known as:**
 - a. Analytical cycle
 - b. Design cycle
 - c. Program specification
 - d. System development life cycle

- iii. Enhancements, up gradation and bugs fixation are done during the _____ step in the SDLC.**
 - a. Maintenance and evaluation
 - b. Problem identification
 - c. Design
 - d. Development and documentation

- iv. The _____ determines whether the project should go forward**
 - a. Feasibility
 - b. Problem identification
 - c. System evaluation
 - d. Program specification

- v. _____ spend most of their time in the beginning stages of the SDLC, talking with end-users gathering requirements, documenting system and proposing solutions.
- Project managers
 - System analysis
 - Network engineers
 - Database administrators
- vi. The entities having a positive or negative influence in the project completion are known as:
- Stakeholders
 - Stake supervisors
 - Stake owners
 - None
- vii. System maintenance is performed in response to _____
- Business change
 - Hardware and software changes
 - User's requests for additional features
 - All of the above

Answers:

i.	Problem identification	ii.	System development life cycle
iii.	Maintenance and evaluation	iv.	Feasibility
v.	Project managers	vi.	None of the above
vii.	All of the above		

SHORT QUESTIONS

Q2. Write short answers of the following questions

i. What is a system?

Answer

System

A system is a set of components (hardware and software) for collecting, creating, storing, processing and distributing information.

ii. Name different phases of SDLC

Answer

Phases of SDLC

The following are phases of SDLC

1. Defining Problem
2. Planning
3. Feasibility study
4. Analysis
5. Requirement engineering
6. Design
7. Coding
8. Testing/verification
9. Deployment/implementation

iii. What are the objectives of SDLC?

Answer

Objectives of SDLC

A system development lifecycle (SDLC) has three primary objectives

1. Ensure that high quality system are delivered
2. Provide strong management controls over the projects
3. Maximize the productivity

iv. Give some activities of planning phase

Answer

Activities of Planning Phase

Following are the activities of planning phases

1. Risk management
2. Acquisition
3. Change management
4. Configuration Management
5. Project Categorization
6. Requirements Management
7. Communications
8. Work breakdown structure/project Schedule
9. Independent Verification & validation
10. Quality assurance
11. Records management
12. Staff development
13. Security Approach

v. Different between functional and non-functional requirements

Answer

Difference

Functional Requirements	Non-functional Requirements
Functional requirements specify the software functionality that the developers must build into the product to enable users to accomplish their tasks	Non-functional requirements specify criteria for the judgment of the operations of a system. It describes that how well the system perform its duties.

vi. Design phase is considered as the architectural phase of SDLC. Give reasons

Answer

Reasons

In design phase we transform the requirement into complete and detailed system design specifications. The flow of data processing is developed into charts and the project team determines the most logical design and structure for data flow and storage.

vii. Explain flowchart symbols

Answer

Flowchart Symbols

Some most commonly used flowcharts symbols are shown in the table below

Symbol Description	Symbol shape	Symbol Description	Symbol shape
Flow line		Process	
Start/Stop		Decision	
Input/Output		Connector	

Table: Flowchart symbols

viii. What is the purpose of testing/verification phase of SDLC?

Answer

Purpose of Testing/Verification Phase of SDLC

The purpose of testing/verification is to evaluate an attribute or capability of a program or system and determine that whether it meets its required results.

ix. Give main activities of the Implementation Phase

Answer

Main activities of the Implementation Phase

The main activities that are involved during deployment/implementation phase are

1. Installed and activation of the hardware and software
2. In some cases, the users and the computer operation personals are trained on the developed software system
3. The process of changing from the old system to the new one is called conversion

EXTENSIVE QUESTIONS

Q3. Write long answers of the following questions

i. Define software development life cycle (SDLC). What are its objectives?

Answer

System developing life cycle (SDLC)

System developing life cycle (SDLC) is a problem solving process through which a series of steps or phases helps to produce a new computer system

Objectives of System Development Life Cycle

A systems development lifecycle (SDLC) has three primary objectives.

1. Ensure that high quality systems are delivered
2. Provide strong management controls over the products
3. Maximize the productivity

Summary of Objectives

These objectives are summarized as follows

1. One of the major objectives of SDLC is to establish an appropriate level of management authority is to direct, coordinate control review and approve the software development project
2. SDLC should identify the potential project risks in advance so that proper planning should be done in early

ii. **What is system? Where exactly the Testing activities begin in SDLC?**

Answer

System

A system is a set of components (hardware and software) for collecting, creating, storing, processing and distributing information. A system can be developed by applying a set of methods, procedures and routines in a proper sequence to carry out some specific task

Beginning of Testing Activities

The testing activities exactly begins after construction phase

iii. **Why software development life cycle is important for the development of software?**

Answer

Software development life cycle is important for the development of software because of the following reasons

- i. System development life cycle (SDLC) delivers quality software which meet the system requirement
- ii. System development life cycle (SDLC) ensures that the requirements for the development of the software system are well defined and subsequently satisfied
- iii. System development life cycle (SDLC) delivers cost effective system
- iv. System development life cycle (SDLC) maximizes the productivity
- v. Who are stakeholders of SDLC? Describe their responsibilities.

Answer

Stakeholders of SDLC are those entities or groups, which are either within the organization or outside of the organization that sponsor plan, develop or use a project. Stakeholders may be users, managers and developers. It is the duty of the project management team to identify the stakeholders, determine their requirements, expectation and manage their influence in relation to the requirements to ensure a successful project

Responsibilities

Stakeholders have responsibility to business that include educating developers, financing projects, creating scheduling parameters and settling milestone dates.

- vi. **What is feasibility study? Explain its different types**

Answer

Feasibility Study

Feasibility study is used to assess the strengths and weakness of a proposed software/system and present directions of activities which will improve a project and

achieve desired results. The nature and components of feasibility studies depend primarily on the areas in which analyzed projects are implemented

Feasibility study is the analysis and evaluation of a proposed project/system to determine whether it is technically financially/economically legally and operationally feasible within the estimated cost and time. Feasibility study is one of the important steps in SDLC

Example

The **Students Examination System Development** project is assessed for all types of feasibilities and presented to management for final approval

Types/forms of Feasibility Study

Feasibility study is divided into the following types/forms

- i. Technical feasibility
- ii. Economic feasibility
- iii. Operational feasibility
- iv. Legal feasibility
- v. Schedule feasibility

1. Technical feasibility

The technical feasibility Study aims to determine whether or not the product is technically feasible. This study determines how the technical requirements of the project can be fulfilled, which location would be the most appropriate and what should be the size of the plan? This study and demand and market feasibility study are the important pre-requisites for evaluating project prospects for commercial profitability and national economic profitability upon which the final decisions should depend. The technical study also provides the basis for cost estimating

A suitable technical feasibility should cover the following steps:

- i. Materials and Inputs

- ii. Production Technology
- iii. Product Max
- iv. Location and Site
- v. Plant capacity
- vi. Structures and Civil works
- vii. Machinery and Equipment
- viii. Project Chart and Layouts
- ix. Work Schedule

2. Economic feasibility

The proposed project should provide favorable economic benefits to the entity. The economic feasibility assessment is conducted to analyze the aspect. There is also a need to identify and quantify the economic benefits that is expected to be provided by the project. This feasibility necessarily involved comparative analysis of cost and benefits.

3. Operational feasibility

In the execution of the project, the entity is expected to face some problems and also there may be some opportunities arising in the course of the project. The operational feasibility is a measure of this fact only i.e. the ability to solve problems and taking advantages of opportunities. The assessment under this study emphasizes on the degree to which the proposed project fits in existing scenario and also the objectives with regards to following

- i. Development schedule
- ii. Delivery
- iii. Corporate culture
- iv. Existing business processes

To ensure success there are certain parameters to be considered at very early stage of design. These include the following

- i. Reliability
- ii. Maintainability
- iii. Supportability
- iv. Usability
- v. Productivity
- vi. Disposability
- vii. Sustainability
- viii. Affordability

In fact, this feasibility is a critical aspect of systems engineering and also needs to be an integral part of the early design phase. It is so because a system becomes most effective for the desired purposes when its design includes the technical and operating characteristics

4. Legal feasibility

Every entity is bound to fulfill the legal requirements. There is a need to study the legal scenario and to see the legal implications of the project. It necessarily involves ethical considerations. So, it is also called as Ethical Feasibility. Before the actual execution of the project undertaken, it has to be ensured that it meets all ethical and legal requirements

5. Schedule feasibility

The time element of a project has its own importance. It is so because a project will fail or is unsuccessful if it takes too much time to complete. It means there is a need to estimate the time required to develop the system. The deadline for the project needs to be initiated. It is also necessary to decide the durability or whether the deadlines are mandatory? It is also ascertained whether the company currently has the required time resources for undertaking the project? The possibility of completion of project in the available time is also checked.

- v. **What is the purpose of Requirement Engineering phase? Explain its various steps in detail.**

Answer

Purpose of Requirement Engineering

The purpose of requirement engineering is to identify and communicate the purpose of a software system and the framework in which it will be used

Steps of Requirement Engineering

Requirements engineering consists of the following steps

- i. Requirement gathering
- ii. Requirement validation
- iii. Requirements management

i. Requirement Gathering

Requirement gathering is usually the first part of any software/system development process. In this step meetings with the customers are arranged, the market requirements and features that are in demand are analyzed

Types of Requirement Gathering

These requirement are of two types

- a. Functional requirements
- b. Non-functional requirement

a. Functional requirement

Functional requirements specify the software functionality that the developers must build into the product to enable users to accomplish their tasks

b. Non-functional requirements

Non-functional requirement specify criteria for the judgment of the operations of a system. It describes that how well the system perform its duties

ii. Requirements Validation

Requirement validation is concerned with examining the requirements to certify that they meet the intentions of the stakeholders. The validation differs

from verification in the sense that verification occurs after requirements have been accepted. In requirements validation, the requirements elicited are reviewed to check that requirements are complete and accurate.

iii. Requirement Management

Requirement management is performed to ensure that the software continues to meet the expectations of the acquirer and users. Requirements management needs to gather new requirements that arise from changing expectations, new regulations or other sources of change.

vi. Which personnel are involved in SDLC? Explain their role briefly

Answer

Personnel

Different groups of people and individuals called personnel perform SDLC activities. These personnel are professionals in performing their particular jobs.

Types of Personnel

In SDLC, following types of personnel are involved

- i. Management Personnel
- ii. Project manager
- iii. System Analyst
- iv. Programmer
- v. Software tester
- vi. Customer

1. Management Personnel/Team

A strong management team has the ability to satisfy the customers and acquires of the software system. Also, a proposed project or a product will only meet its objectives if managed properly, otherwise, will result in failure.

Roles of a Good Management Team

The roles of a good management team are to

- i. Provide consistency of success of the software with regard to Time, Cost and Quality objectives
- ii. Ensure that customer expectations are met
- iii. Collect historical information and data for future use
- iv. Provide a method of thought for ensuring all requirements are addresses through a comprehensive work definition process
- v. Reduce risks associated with the project

2. Project Manager

A project manager is a professional responsible for planning, execution and closing of any project. Apart from management skills, a software project manager will typically have an extensive background in software development. She/he is also expected to be familiar with the whole software development life cycle process.

Key Roles of a Project Manager

The key roles of a project manager are

- i. Developing the project plan
- ii. Managing the project budget
- iii. Managing the project stakeholders
- iv. Managing the project team
- v. Managing the project risk
- vi. Managing the project schedule
- vii. Managing the project conflicts

3. System Analyst

A system analyst is a professional in the field of software development that studies the problems plans solutions for them recommends software systems, and coordinates development to meet business or other requirements. System analyst

has expertise in a variety of programming languages, operating systems and computer hardware platforms.

Roles & responsibilities of an Analyst

The general roles and responsibilities of an analyst are defined below

- i. Plan a system flow
- ii. Interact with customers to learn and document requirements that are then used to produce business requirements documents
- iii. Define technical requirements
- iv. Interact with designers to understand software limitations
- v. Help programmers during system development phase
- vi. Manage system testing
- vii. Document requirements and contribute to user manuals.

4. Programmer

A programmer is a technical person that writes computer programs in computer programming languages to develop software. A programmer writes, test, debugs and maintains the detailed instructions that are executed by the computer to perform their functions

Responsibilities of a Programmer

The responsibilities of a programmer include

- i. Writing, testing and maintain the instructions of computer programs
- ii. Updating, modifying and expanding existing programs
- iii. Testing the code by running to ensure its correctness
- iv. Preparing graphs, tables and analytical data displays which show the progress of a computer program

5. Software tester

A software tester is a computer programmer having specialty in testing the computer programs using different testing techniques.

Responsibilities of a Software Tester

Software tester is responsible for understanding requirements, creating test scenarios, test scripts, preparing test data, executing test scripts, reporting defects and reporting results.

6. Customer

A customer is an individual or an organization that is current or potential buyer or user of the software product. Customers usually purchase software from software manufacturer companies (software houses), users groups and individuals.

Customers are the real evaluators of a software product by using it and identifying its merits and demerits.

Clients

Customers are also called clients but the only difference between the two is that the customers purchase the software products and the clients purchase services.

LAB ACTIVITIES

Prepare a chart to show all the phases of SDLC

Answer

Practical Work

