Information systems Development

(Sheet 1)

Q1: Give brief notes about the Strengths point of the following:

|  |  |
| --- | --- |
| (A) RAD model | (B) Waterfall model |
| (C) Spiral model | (D) Incremental model |

Answer

1. RAD model Strengths:

. Reduced cycle time and improved productivity with fewer people means lower costs

. Time-box approach mitigates cost and schedule risk

. Customer involved throughout the complete cycle minimizes risk of not achieving customer satisfaction and business needs

. Focus moves from documentation to code .

. Uses modeling concepts to capture information about business, data, and processes

1. Waterfall model Strengths:
	1. Easy to understand, easy to use
	2. Provides structure to inexperienced staff
	3. Milestones are well understood
	4. Sets requirements stability
	5. Good for management control (plan, staff, track)
	6. Works well when quality is more important than cost or schedule
2. Spiral model Strengths:
	* 1. Provides early indication of insurmountable risks, without much cost
		2. Users see the system early because of rapid prototyping tools
		3. Critical high-risk functions are developed first
		4. The design does not have to be perfect
		5. Users can be closely tied to all lifecycle steps
		6. Early and frequent feedback from users
		7. Cumulative costs assessed frequently

Q2: Compare between Waterfall model and RAD model

|  |  |  |
| --- | --- | --- |
|  | Waterfall model | RAD model |
|  | * **Requirements** – defines needed information, function, behavior, performance and interfaces( specification and planning).
* **Design** – data structures, software architecture, interface representations, algorithmic details.
* **Implementation** – source code, database, user documentation, testing, installation, and maintenance.
 | * Requirements planning phase (a workshop utilizing structured discussion of business problems)
* User description phase – automated tools capture information from users
* Construction phase – productivity tools, such as code generators, screen generators, etc. inside a time-box. (“Do until done”)
* Cutover phase -- installation of the system, user acceptance testing and user training
 |
| When to use  | * **Requirements are very well known (A set of high quality, stable user requirements exist )**
* **Product definition is stable**
* **Technology is understood**
* **New version of an existing product**
* **The user require all complete system at once**
* **Previous experience of building similar systems exist**
* **The duration of the project is two years or less**
 | * Reasonably well-known requirements
* User involved throughout the life cycle
* Project can be time-boxed
* Functionality delivered in increments
* High performance not required
* Low technical risks
* System can be modularized
 |
| **Strengths** | * **Easy to understand, easy to use**
* **Provides structure to inexperienced staff**
* **Milestones are well understood**
* **Sets requirements stability**
* **Good for management control (plan, staff, track)**
* **Works well when quality is more important than cost or schedule**
 | * Reduced cycle time and improved productivity with fewer people means lower costs
* Time-box approach mitigates cost and schedule risk
* Customer involved throughout the complete cycle minimizes risk of not achieving customer satisfaction and business needs
* Focus moves from documentation to code .
* Uses modeling concepts to capture information about business, data, and processes.
 |
| **Deficiencies****Or****Weaknesses** | * **All requirements must be known upfront**
* **Deliverables created for each phase are considered frozen – inhibits flexibility**
* **Can give a false impression of progress**
* **Does not reflect problem-solving nature of software development – iterations of phases**
* **Integration is one big bang at the end**
* **Little opportunity for customer to preview the system (until it may be too late)**
 | * Accelerated development process must give quick responses to the user
* Risk of never achieving closure
* Hard to use with legacy systems
* Requires a system that can be modularized
* Developers and customers must be committed to rapid-fire activities in an abbreviated time frame.
 |

Q3: Choose the correct answer

1- ……………………… aims at defining the requirements of the system through arranging workshop utilizing structured discussion of business problems

|  |  |
| --- | --- |
|  (A) RAD  | (B) class design  |
| (C) waterfall model | (D) Object design |

2-The use of a ……………………… improves the practice of information systems development.

|  |  |
| --- | --- |
|  (A) object model | (B) component diagram  |
| (C) deployment diagram | (D) methodology |

3-……………………… must answer the research question

|  |  |
| --- | --- |
|  (A) methods | (B) methodology  |
| (C) Implementation  | (D) Testing |

4-……………………… is be considered tool of information system development.

|  |  |
| --- | --- |
|  (A) flowcharts  | (B) organization chart |
| (C) power designer | (D) Class |

5-……………………… describes initial project scope, goals, tasks schedule, and budget

|  |  |
| --- | --- |
|  (A) system initiation | (B) system analysis  |
| (C) system design | (D) system implementation |

6-We use ……………………… when the project can be time boxed

|  |  |  |
| --- | --- | --- |
| (A) RAD | (B) Spiral | (C) Waterfall |

7------------------prioritizes requirements of the system in groups

|  |  |
| --- | --- |
|  (A) incremental model | (B) object design |
| (C) problem domain concepts | (D) RAD |

8-The ……………………… include documentation of business requirements for the proposed system

|  |  |
| --- | --- |
| (A) Joint Application Development Report | (B) DFD |
| (C) DD | (D) relationships report |

9-…………………… is a linear sequential model that tries to define each part of the cycle and a very good method for developing large systems.

|  |  |
| --- | --- |
|  (A) Prototyping  | (B) Waterfall |
| (C) Spiral model | (D) RAD |

10- ------------------------------aims at defining the requirements of the system under construction

* 1. Requirement engineering (B) software engineering

(C ) functional requirements (D ) non functional requirements

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(Sheet 2)

Q1: Choose the correct answer

1- ……………………… include ways to evaluate the costs and benefits of different solutions and methods to formulate the detailed design necessary to develop computer applications.

|  |  |
| --- | --- |
|  (A) Techniques | (B) tools |
| (C) methodology | (D) Object design |

2- ------------------------------------- define initial project scope, goals, tasks schedule, and budget.

|  |  |
| --- | --- |
|  (A) system initiation | (B) system analysis |
| (C) system design | (D) system implementation |

3- ………………………………….the study of a business problem domain to recommend improvements and specify the business requirements and priorities for the solution.

|  |  |
| --- | --- |
|  (A) system initiation | (B) system analysis |
| (C) system design | (D) system implementation |

4- Determine which system is required to support the strategic goals of organization is one of three primary activities of:

|  |  |
| --- | --- |
|  (A) system initiation | (B) system analysis |
| (C) system design | (D) system implementation |

5-Develop the project plan includes the main three questions that are:

|  |  |
| --- | --- |
|  (A) what, when, who | (B) what , who, how |
| (C) what ,when, where | (D) what, where, how |

6- ……………. involves end users and IT specialists working together to gather, understand, and document the business requirements

|  |  |
| --- | --- |
|  (A) system initiation | (B) system analysis |
| (C) system design | (D) system implementation |

7- It is a highly structured workshop that brings together users, managers, and information systems specialists to jointly define and specify user requirements, technical options, and external designs (inputs, outputs, and screen)

|  |  |
| --- | --- |
|  (A) JAD | (B) requirement engineering |
| (C) project scope document | (D) requirement definition |

8- System initiation defines the high level system requirements through writing ………… in one paragraph

|  |  |
| --- | --- |
|  (A) JAD | (B) requirement engineering |
| (C) project scope document | (D) requirement definition |

9- It answers the question “is this project worth looking at?”

|  |  |
| --- | --- |
|  (A) system survey | (B) system study |
| (C) system definition | (D) system design |

10- It answers the question ““is a new system really worth building?”

|  |  |
| --- | --- |
|  (A) system survey | (B) system study |
| (C) system definition | (D) system design |

11- It answers the question ““What does the user need and want from a new system?”

|  |  |
| --- | --- |
|  (A) system survey | (B) system study |
| (C) system definition | (D) system design |

12- It show how the system stores, processes, and transforms data

|  |  |
| --- | --- |
|  (A) DFD | (B) FDD |
| (C) Use case diagram | (D) sequence diagram |

13- It represents the interaction between users as an actor and the information systems

|  |  |
| --- | --- |
|  (A) DFD | (B) FDD |
| (C) Use case diagram | (D) sequence diagram |

14- It shows the timing of interactions between objects as they occur

|  |  |
| --- | --- |
|  (A) DFD | (B) FDD |
| (C) Use case diagram | (D) sequence diagram |

15- It involves answers to five familiar questions: who, what, where, when, and how

|  |  |
| --- | --- |
|  (A) fact finding | (B) observation |
| (C) interview | (D) DFD |

: Give brief notes about the following points:

1. Benefits of JAD

There are numerous of benefits to JAD:

1- it tends to improve the relationship between users, management, and information systems professionals ( increase confidence between user and management)

2- it tends to improve the computer literacy of users and managers as well as the business and application literacy of information systems specialists

3- it places the responsibility for conflict resolution where it belongs

4- it decrease the total system development time by integrating and getting multiple interviews into the structured workshop

5- it lowers the cost of the systems development by getting the requirements correctly defined and prioritized the first time

1. The main activities of survey phase of system analysis

Survey Phase Activities:

1- Conduct initial interview ( 45-60 minutes) to record lists of people, data, activities, locations and networks, and existing technology, list of problems, opportunities, constraints, ideas, opinions ( fact finding techniques)

2- define the project scope ( of the proposed project through drawing context model that determine the boundaries and scope of the system – data scope- process scope- network scope –function point analysis)

3- classify problems , opportunities, and possible solutions ( a quick fix, enhancement, new development , visibility, priority, and solution in the matrix form)

4- established a proposed project plan

5- present survey findings and recommendations

The main objectives of study phase of system analysis

1- to understand the business environment of the system

2- to understand the underlying causes and effects of the problems

3- to understand the benefits of exploiting opportunities

4- to understand the implications of noncompliance with directives

The main objectives of definition phase of system analysis

1- to define business ( nontechnical) requirements that address problems identified with the current system

2- to define business requirements that discover opportunities identified with the current system

3- to define business requirements that fulfill directives

Q3: Define the following:

1-Requirements engineering

* aims at defining the requirements of the system under construction.

2-Functional Decomposition Diagrams (FDD)

* + It is a top –down representation of a function or process ( Structure chart)

3-JAD

It is a highly structured workshop that brings together users, managers, and information systems specialists to jointly define and specify user requirements, technical options, and external designs( inputs, outputs, and screen)

 4-Use Case Diagrams

* It represents the interaction between users and the information systems
* User becomes an actor, with specific role that describes how he interacts with the system

5-Sequence Diagrams

* It shows the timing of interactions between objects as they occur
* System analyst might use a sequence diagram to show all possible outcomes or focus on a single scenario

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(Sheet 3)

Q1: Choose the correct answer:

1-  System analysts use many graphical models and techniques to describe an information systems one of them is:

|  |  |
| --- | --- |
|   (A) fact finding | (B) observation |
| (C) interview | (D) DFD |

2-  ------------ is a graphical representation of reality.

|  |  |
| --- | --- |
|   (A) model | (B) observation |
| (C) interview | (D) power designer  |
|  |  |

3----------- ---is a technique for organizing and documenting the structure and flow of data through a system’s processes.

|  |  |
| --- | --- |
|   (A) fact finding techniques | (B) observation |
| (C) process modeling | (D) data modeling  |

4-A business user, when questioned will usually focus on the ------ of that operation.

|  |  |
| --- | --- |
|   (A) tools | (B) observation |
| (C) process  | (D) data   |

5----------- ---- may be defined as an action or series of actions which produce a change or development.

|  |  |
| --- | --- |
|   (A) external entity | (B) process |
| (C) data flow | (D) sink  |

6-**-----------** is Graphical descriptions of the sources and destinations of data.

|  |  |
| --- | --- |
|   (A) DFE | (B) DFD |
| (C) UML | (D) Use case diagram  |

7- Represent the flow of data between sources and destinations, processes, and data stores

|  |  |
| --- | --- |
|   (A) data flow arrow | (B) data store |
| (C) external entity | (D) Use case diagram  |

8- -----------provides a summary-level view of the system.

|  |  |
| --- | --- |
|   (A) data flow arrow | (B) context diagram |
| (C) DFD1 | (D) Use case diagram  |

9- --------ensure that the input and output data flows of the parent DFD are maintained on the child DFD.

|  |  |
| --- | --- |
|   (A) context diagram | (B) DFD1 |
| (C) balancing | (D) sequence diagram  |

10----- source ----- -supplies data to the system while-- sink --- receives data from the system.

|  |  |
| --- | --- |
|   (A) source | (B) sink |
| (C) balancing | (D) sequence diagram  |

Q2: Give brief notes about the following points:

1-  Advantages of data flow diagram

* A major advantage of a DFD is a graphical nature that makes a good communication tool between:
	+ User and analyst
	+ Analyst and System designer
* Users are able to visualize:
	+ How the system will operate.
	+ What the system will accomplish .
	+ How the system will be implemented .

 2-  Disadvantages of data flow diagram

A DFD becomes difficult to understand when it has more than 7 to 9 processes.

* + A DFD does not provide an information about
		- the timing or ordering of processes
		- whether processes will operate in sequence or in parallel.

 3-  Symbols used in data flow diagram

A data flow diagram consists of four basic elements:

* + External entities (Data sources and destinations –sink)
	+ Data flows
	+ Processes
	+ Data stores

Limitation of drawing data flow diagram

1. Draw the context diagram so it fits on one page.
2. Use the name of the information system as the process name in the context diagram.
3. Use unique names within each set of symbols.
4. Don’t cross lines.
	1. In order to keep the diagram uncluttered, you can repeat Data Stores or External Entity on a diagram.
5. Provide a unique name and reference number for each process, you should not have more than 9 process symbols.
6. Obtain as much user input and feedback as possible.

Q3; define the following item:

1-  Model

* + - is a representation of reality. Just as a picture is worth a thousand words, most system models are pictorial representations of reality.

2-  Process modeling

* is a technique for organizing and documenting the structure and flow of data through a system’s processes.

3-  Data flow diagram

is a graphical representation of the flow of data through an Information Systems.

1. Context diagram
	1. It provides a summary-level view of the system.
	2. It depicts a data processing system and the external entities that are:
		1. Sources of its input
		2. Destinations of its output
2. Balancing
3. ensure that the input and output data flows of the parent DFD are maintained on the child DFD.

Q4: put (√) or (×) with correct the wrong answer:

1-  If two data elements flow together, then the use of one data flow line is not appropriate.

-(x) is appropriate

2-  If the data elements do not always flow together, then multiple lines will not be needed.

- (x) will be needed

3-  External entity represent the transformation of data inside DFD

- (x) processes

4-  Data flow used to define system boundaries

- (x) external entities

5-  Data store represent a temporary or permanent data repository

- (true)

6-  Data flow diagram level one is a top-level view of an information system that

shows the system’s boundaries and scope.

- (x) lower-level

7-  Context diagram provides a summary-level view of the system.

- (true)

8-  Source receives data from the system while sink supplies data to the system.

- (x) sink ..... source

9-  Inputs to a process are always different than outputs

( True )

10 – One of DFD advantages that it becomes difficult to understand when it has more than 7 to 9 processes.

- (x) disadvantage