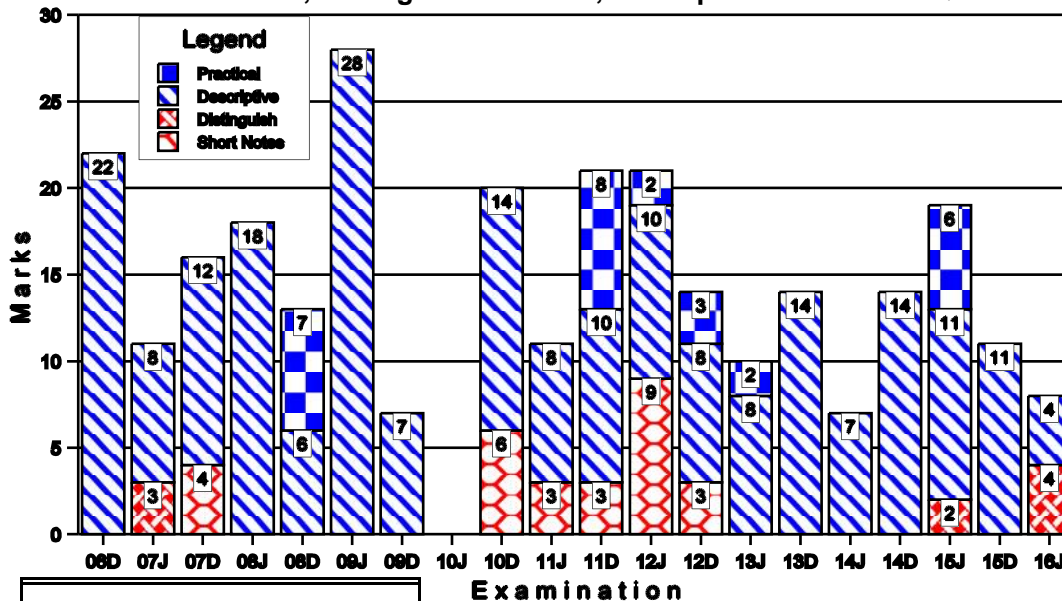


1

Information System Analysis and Design

This Chapter Includes: Contribution of it in the social life & industrial fields, System Development Process & Life Cycle, System Requirement Analysis / System Analysis, System Design, System Acquisition & Development of Software, System Testing, System Maintenance, Er-Entity Relationship Diagram, Structure Charts, Transform & Transaction Analysis

Marks of Short Notes, Distinguish Between, Descriptive & Practical Questions



SHORT NOTES

2007 - Dec [8] Write a short note:

(f) Open and Closed systems.

(4 marks)

Answer :

An open system is a system which has the capability of reacting to and adopting itself to changes in the business environment, for example, changes in market conditions, statutes, technologies etc. An open system is flexible enough to interface and adjusts itself with the dynamic business situation.

A closed system is insular in it and does not interact with its environment and therefore is of little relevance in today's dynamic business world.

2010 - Dec [8] Write short notes on the following:

(a) Models to represent Information;

(e) VB;

(3 marks each)

Answer :

(a) Please refer 2009 - June [7] (e) on page no. 251

Answer:

(e) **VB (Visual Basic)** - VB is the third-generation event-driven programming language and integrated development environment (IDE) from Microsoft for its COM programming model. Visual Basic is relatively easy to learn and use.

Visual Basic was derived from BASIC and enables the rapid application development (RAD) of graphical user interface (GUI) applications, access to databases using Data Access Objects, Remote Data Objects, or Active Data Objects, and creation of ActiveX controls and objects. Scripting languages such as VBA and VB Script are syntactically similar to Visual Basic, but perform differently.

A programmer can put together an application using the components provided with Visual Basic itself. Programs written in Visual Basic can also use the Windows API, but doing so requires external function declarations. It has also the special feature of integration with Computer Output Microfilm (COM) components written in other languages. Computer Output Microfilm components can also be linked to embedded in application's user interface.

Advantages of Visual Basic-

- It is simple language
- It has comprehensive online help facility
- It supports Graphical User Interface
- It supports the facilities of integration of COM components written in other language
- It has Object Linking and Embedding facilities.

Disadvantages of Visual Basic-

- Programs written in Visual Basic are slower and less robust.
- Visual Basic programs have limited portability in Windows environment.
- It has very limited access to library.
- Object Linking and Embedding needs large amount of memory.

2011 - June [8] Write a short note on the following :

(d) Role of Security Administrator;

(3 marks)

Answer:

Role of Security Administrator: The threats of damage or loss of hardware, data and software by frauds have evolved a new responsibility in information system environment, that is to ensure the safety to information system.

His responsibilities are:

- Framing information system security policy.
- Devising measures to ensure safeguard from possible threats.
- Train the staff for effective action.
- Implementation of security system.
- Monitor the security measures.
- Developing action plan for emergency recovery.

2011 - Dec [8] Write a short note on the following:

(a) Fourth Generation Language;

(3 marks)

Answer :

Fourth Generation Language - A non-procedural programming language that requires less coding than lower-level languages. Command-line languages that come with operating systems and database management systems (DBMSs) are fourth-generation languages (4GLs), as are query languages and report writers. Any language with English-like commands that does not require traditional input-process-output logic falls into this category.

In addition, software tools that use graphical interfaces for building applications or generating queries are also considered fourth generation. Underlying the menus and buttons are fourth-generation command structures that are activated with a click of the mouse.

Development of wide varieties of data structure is a part and parcel of the evolution process. To reduce the burden of programmer, programming language evolved some user-friendly tools. Like the evolution in hardware, programming language is undergoing developments which have conceptualized as generation in terms of features, capability and technique. The input/output devices used in Fourth generation language is bracketed as the languages which have the following features:

- It is a combination of simple commands and simple structure.
- It includes decision support facilities with simple what-if structure.
- It supports tools to develop user-friendly software.
- It has facilities of easy handling of databases.

2012 - June [8] Write short notes on the following :

(c) Expert system;

(d) CASE tools,

(f) Advantages of Flow charts;

(3 marks each)

Answer:

(c) An expert system is a computer system that emulates the decision-making ability of a human expert. Expert systems are designed to solve complex problems by reasoning about knowledge, like an expert, and not by following the procedure of a developer as is the case in conventional programming.

According to CIMA, "an Expert System is an application software system

which is used to store data relevant to a particular subject area and to provide solutions to problems requiring discriminatory judgement based on that data.”

For example, knowledge of expert marketing management for experts system in marketing, knowledge of legal expert for expert system in legal field, expert knowledge of taxation for expert system in taxation.

This expert knowledge and history of different unstructured problem solutions are stored in organized manner so that the related expert system can use the data base .The expert system is not a simple management information system. Rather it helps in involving solutions in complex problem situation. The component in expert systems are:

- Data management
- Expert knowledge handling tools
- Complex problem situations and framing corresponding solutions sets.

Answer:

(d) Computer-aided software engineering (CASE) is the scientific application of a set of tools and methods to a software system which is meant to result in high-quality, defect-free, and maintainable software products. It also refers to methods for the development of information systems together with automated tools that can be used in the software development process and also can be used for having automatic designing assistance with the help of versatile system designing facilities available in them. Advantages of CASE tools are as follows:

- They are computer based programs to increase the productivity of analysts.
- They permit effective communication with users as well as other members of the development team.
- They integrate the development done during each phase of a system life cycle.
- They assist in correctly assessing the effects and cost of changes so that maintenance cost can be estimated.

Available CASE tools

- System requirements specification documentation tool
- Data flow diagramming tool
- System flow chart generation tool
- Data dictionary creation
- Formatting and checking structured English process logic.

Answer:

(f) Advantages of Flow Charts: Flow Chart is the diagrammatic representation of the algorithm i.e. program logic. It uses a unique set of symbols to describe the conditions and actions. A flow chart shows various steps in the routine, sequence of activities, movement of work, distance travelled and time taken for each step. The main advantages of flow charts are as follows:

1. **Communication:** Flow charts are better way of communicating the logic of a

- system to all concerned.
2. **Effective analysis:** With the help of flow chart, problem can be analyzed in more effective way.
 3. **Proper documentation:** Program flow charts serve as a good program documentation, which is needed for various purposes.
 4. **Efficient Coding:** The flowcharts act as a guide or blueprint during the systems analysis and program development phase.
 5. **Proper Debugging:** The flowchart helps in debugging process.
 6. **Efficient Program Maintenance:** The maintenance of operating program becomes easy with the help of flow chart. It helps the programmer to put efforts more efficiently on that part.

2012 - Dec [8] Write a short note on the following:

(e) Criteria for selection of a computer system.

(3 marks)

Answer

Various criteria should be considered in selection of a computer system

1. Economic criteria
 - i. Cost comparison
 - ii. Return on Investment
2. Hardware criteria
 - i. Performance, Reliability, Capacity and price of hardware
 - ii. Life of the hardware
 - iii. Compatibility with existing system
3. Software criteria
 - i. Performance, capability and special feature of software
 - ii. Price of software
 - iii. Availability of useful and well documented package programs
 - iv. Easy to use and easy to modify as per requirement
4. Service criteria
 - i. Maintenance cost, terms and quality
 - ii. After sales services
 - iii. Programming assistance and conversion assistance offered
5. Reputation of Manufacturers.

DISTINGUISH BETWEEN

2007 - June [3] (b) Differentiate between the following :

(iv) 'Artificial intelligence' and 'expert systems'.

(3 marks)

Answer :

Expert System : According to CIMA, an Expert system is an application software system

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which is used to store data relevant to a particular subject area and to provide solutions to problems requiring discriminatory judgment based on that data. The knowledge of an expert is invaded in the software with solution option for different complex problem situation, particularly, unstructured problem situation. The expert system is not a simple management information system. Rather it helps in involving solution in problem situation.

Artificial Intelligence (AI) : Artificial Intelligence refers to behaviour of computer system which seems to be intelligence of the computer itself. This phenomenon is exhibited by a computer system out of the knowledge base to evolve intelligent solution. It is only the expert system which can exhibit artificial intelligence.

2015 - June [1] Answer the question:

(g) According to Working/Output, differentiate between 'Deterministic System' and 'Probabilistic System'. (2 marks)

Answer:

Difference between 'Deterministic System' and 'Probabilistic System' according to Working/Output:

Deterministic System	Probabilistic System
A deterministic system operates in a predictable manner wherein the interaction among the parts is known with certainty.	It can be described in terms of probable behavior, but, a certain degree of error is always attached to the prediction. Where a set of instructions given to a human who, for a variety of reasons, may not follow the instructions exactly as given.

2016 - June [III] Answer the question:

1. (a) Distinguish between open and closed systems with examples.

(4 marks)

DESCRIPTIVE QUESTIONS

2006 - Dec [4] (c) What are the implications of the following pairs of terminology in an information system environment ?

(i) Validity check and Hash total.

(ii) Syntax error and Logical error.

(2 marks each)

Answer :

(i) **Validity check and Hash total** : Validity Check refers to checks against pre-determined codes data, tables stored in the computer file for ensuring correctness or validity of the input data.

Hash total is defined as the sum of certain specified nominal factors in the records being processed, which has no accounting significance or meaning

other than serving the purpose of a control total for checking accuracy of the data being processed.

- (ii) **Syntax error** : Syntax error is a mistake in instruction or use of a programming language detected during compilation of a program and the response is indicated by the operating system in the form of an output. Such mistakes may be a spelling mistake or use of wrong word or wrong sequence or a deviation from the defined usage of the programming language.

Logical error : Logical error arises from wrong reasoning or faulty programming logic e.g., trying to execute invalid data with invalid instruction or wrong sequence of instruction or forming an unending loop, etc.

2006 - Dec [5] (c) Explain briefly "system" and its characteristics. What do you understand by integration of systems ? (6 marks)

Answer :

System and its characteristics: A System is an organized grouping of components persons, methods, machines and materials that are collectively set to accomplish some specified objectives. Scope of the term 'System' thus encompasses a variety of groupings. A Human body, a computer, a business, a factory - can each be categorized as a system.

The characteristics of a system include :

- (a) Components.
- (b) Structures,
- (c) Behavior and
- (d) Life cycle.

Integration of system: When all information in an organization is channeled into a common database to serve the information requirements throughout the organization, it is termed as an 'Integrated System'.

2006 - Dec [7] (c) "While computerization has an array of advantages, it also exposes the company to a number of hazards." Name some of these hazards and some measures to avoid them. (6 marks)

Answer :

Some Hazards of Computerization:

1. Machine breakdown (due to some hardware parts problem).
2. Due to virus infection, the entire data can be destroyed.
3. Due to incompetence of staff the software can be erased from the machine and data can be corrupted.
4. Purposely anybody can damage the system or can tamper the data.

Some of the measures to avoid these hazards : The following are some of the measures to avoid the aforesaid hazards of computerization:

1. Regular backup of the entire data.

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2. The computer should be protected from unauthorized user by restrictions on physical entry and it should be password protected, so that the system cannot be started by any unauthorized person.
3. The 2nd Level of password checking should be done by the software itself, which is running for the computation job.
4. Data encryption.
5. Regular virus scanning and removal.
6. Proper method of data recovery and database recreation.
7. Contingent planning.
8. Disaster recovery program.

2006 - Dec [8] (c) What are the features of a good source document design ? What safeguards should be taken to ensure success before making changes to source documents ? (6 marks)

Answer :

Features of a good source document design: The following are the important features of a good source document design:

1. The Source Document should be very clear. It should be printed and should be large enough to hold all data without it being cramped. At the same time it should be ensured that the same is not so large as to waste space and paper.
2. Data should be entered in boxes so as to separate the individual items as well as individual characters with the boxes themselves being unobtrusive.
3. They should be clearly labeled.
4. Any data, which is standard to the form, should be pre-printed so as to avoid errors.
5. The overall system should be designed in such a way that only one copy of the document is needed.
6. The items on the form should be in natural sequence as far as possible.

Safeguards to be taken before making changes to source documents: The following safeguards should be taken before making changes to source documents :

- (i) Ensure that all the staff, who is going to use them is consulted with regard to the format of the Source Document and obtain their acceptance.
- (ii) The users should be asked to try out the revised document before they are put in to normal usage.

2007 - June [8] (b) What are the main objectives of MIS ? (8 marks)

Answer :

Objectives of Management Information System (MIS):

- To provide current information for monitoring and control
- To provide accurate information about the system
- To provide timely information
- To provide information at least cost
- To provide relevant information for decision making.

2007 - Dec [7] (a) What is system testing and what do we test in this testing?

(b) What do you mean by system analyst? What are the multifaceted roles of a system analyst? (6 marks each)

Answer :

(a) Testing is an important criteria for the success of the system. System testing makes a logical assumption that if all parts of the system are correct, the goal will be successfully achieved. It is observed that inadequate testing or non-testing leads to errors that may not appear until months later. A system is tested for the following:

- (a) Online response
- (b) Volume
- (c) Stress testing
- (d) Recovery and security
- (e) Usability, documentation and procedure.

Answer:

(b) The System Analyst is a person who conducts a methodical study and evaluation of an activity such as a business to identify its desired objectives in order to determine procedures by which these objectives can be gained. The multifaceted roles of a system analyst are:

- (a) Change agent
- (b) Monitor
- (c) Architect
- (d) Psychologist
- (e) Salesperson
- (f) Motivator
- (g) Politician

2008 - June [2] (a) What is parity bit? Why is it used ?

(b) Explain the terms 'Validity Check' and 'Hash Total'. (4 marks each)

Answer :

(a) In order to prevent loss or gain of a bit or data corruption during the process of data transfer within the CPU or between the CPU and the computer peripherals, one more bit called the 'parity check bit' is added to the binary code for each character. Thus, the number of bits is increased by one e.g., 8 bits in the case of ASCII -7 code and 9 bits in the case of 8-bit EBCDIC and ASCII-8 codes. There may be odd or even parity convention depending on the computer circuitry designed by the manufacturer and accordingly '0' or '1' is added to make the total number of bits for the character to be odd or even.

Answer:

(b) **Validity Checks:** It refers to checks against predetermined codes, data, and tables, stored in computer file for ensuring correctness or validity of the input data.

For example, master data contains about supplies as names, address, and code number are available online in the disk file under strict control. In case of payment transaction, computer checks the particulars with disk file and confirms whether the party is valid or not.

Hash Total is sum of certain specified numerical factors in the records being processed which has no accounting significance or meaning other than serving the purpose of a control total for checking accuracy of the data being processed, for example, the numerical quantity column, although in different units of measurement, may be added as 'hash total' and reconciled to ensure that all records and the relevant data are entered accurately.

2008 - June [6] (a) What is meant by 'coding'? What are the characteristics of a good coding system? (4 marks)

Answer :

The term 'coding' is used in either of these two senses:

Writing of program instructions in any programming language. Systematic assignment of system-numeric, alphanumeric- to the classified and sub-classified data. This is an essential component of a data processing system. Such code becomes substitute for normal names or plain language description of items.

A good coding system should have the following characteristics:

- Each code should be unique, compact and meaningful.
- Size of the code should be precise, and of fixed length with some flexibilities to facilitate insertion or expansion as may be envisaged.
- A code of a major key field may have a check digital embedded in it to ensure accuracy of processing.
- Codes should consist of numeric digitals as much as possible to facilitate validation and faster processing.

2008 - June [7] (b) What is Parity Checking? Convert the digit 9 into its EBCDIC representation and add a suitable parity bit so that it conforms the odd parity convention of EBCDIC. (6 marks)

Answer :

In order to prevent loss or gain of a bit of a data corruption during the process of data transfer within the CPU or between the CPU and the computer peripherals, one more bit called the parity check bit is added to the basic code for each character. Thus, the number of bits is increased by one e.g. 8 bits in the case of ASCII -7 code, and 9 bits in the case of 8-bit EBCDIC and ASCII -8 codes. There may be odd or even parity convention depending on the computer circuitry designed by the manufacturer and accordingly '0' or '1' is added to make the total number of bits for the character to be odd or even.

Digit 9 when converted into its EBCDIC representation in odd parity convention will appear as under.

Digit	Zone bit	Digit bit	Parity bit
9	1111	1001	1

2008 - Dec [6] (d) (ii) What does one mean by "Going Live". (2 marks)

Answer:

Going Live: In a "Going Live" phase the system is to be finally implemented in new environment with real life to the satisfaction of end users. In ERP systems, the integration of all modules is critical. The user must understand the sequence of operations, how each module interacts with others and restrictions in operation in terms of priority so as to establish proper checks at all levels. The coordination among project members for different modules is essential for smooth and successful implementation.

2008 - Dec [7] (a) List the nature of preparatory work to be undertaken before a decision on outsourcing of information system services can be taken? (4 marks)

Answer :

It should be determined as to what part of information system activities can be outsourced, what are strategic, and whether suitable, dependable, financially viable and reliable vendors exist.

Terms and conditions of contract including termination clause for outsourcing should be determined incorporating scope of work, audit rights, performance criteria, responsibilities etc. Monitoring compliance with terms and conditions.

Impact on the organization Procedures for outsourcing disaster recovery control.

2009 - June [6] (b) Fill up the following missing blocks which form part of the decision making pattern. Write missing answer against Serial Number only in the answer sheet :

Serial No.	Level of Management	Decision making on	Information support from
1	Lower Level	?	Transaction Processing
2.	Middle Level	Planning & Control	?
3.	Top Level	?	Executive System/Expert System

(3 marks)

Answer :

Serial No.	Level of Management	Decision making on	Information support from
1	Lower Level	Operation Control;	Transaction Processing
2.	Middle Level	Planning & Control	Management Information System
3.	Top Level	Strategic Planning and Implementation.	Executive System/Expert System

2009 - June [7] (a) What is 'Risk Management' in an Information System and what are

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- the steps involved in it ? (1 + 3 = 4 marks)
- (b) Name the four divisions in COBOL. What are its advantages? (2 + 2 = 4 marks)
- (d) Explain FTP mentioning the steps involved in it. (3 marks)
- (e) List and briefly explain the models used for representing the information. (3 marks)

Answer :

- (a) Risk Management in an Information System is a process of assessing risk and reducing it to an acceptable level.

Steps involved in it are :

1. Understanding the sources and causes of risk
2. Collection of data related to risk to analyse their nature and frequency
3. Evaluation of magnitude of risk
4. Develop policy to minimise the risk
5. Develop methodology to prevent their occurrence
6. Implementation of the methodology.

Answer:

- (b) The four divisions in COBOL are:

- (a) IDENTIFICATION DIVISION
- (b) ENVIRONMENT DIVISION
- (c) DATA DIVISION
- (d) PROCEDURE DIVISION

Advantages of COBOL:

- Easy to learn
- Very close to English Language adding self- documentation features
- Most suitable features of structured programming
- Good capability of file handling
- Procedure-oriented language helping modular programming.

Answer:

- (d) FTP or File Transfer Protocol is used for file transfer from one computer to another. It works in client-server technology. A client makes request to have an access to information. The FTP client program searches the file, locates it and transfers the file to servers called FTP servers. These servers act as interface and initiate the transfer process. Steps involved are:

- Connection with the FTP server
- Navigate the file structure
- Transfer the file.

Answer:

- (e) **Iconic scale model** : It is physical replica of the system based on different scale from the original one. Iconic models may appear to scale in three dimensions – such as model of a production process, building, car or an aircraft.

Analytical model: It may be a model for a physical system, but the model differs from the actual system. Example – Map showing water, mountain etc. by different colours.

Mathematical Model: It represents a data set in the form of graph, picture or fictional diagram. It may use highly mathematical or statistical algorithm to interpret data of huge volume with ease. The algorithm varies depending on the complexity of analysis of data sets and the type of analysis.

2009 - June [8] (b) What are the facilities that are required in the computer for an access to the Internet? What are the problems associated with use of Internet?

(2 + 4 = 6 marks)

(c) What is E-Commerce? What are the components involved in it? What are the steps by which a transaction takes place in E-Commerce?

(1 + 1 + 3 = 5 marks)

Answer :

(b) For an access to the Internet, the following facilities are required in the computer:

- An Account with Internet Service Provider – IP Address.
- A telephone connection/Cable connection
- A modem (internal or external)
- Internet browser software (Internet Explorer/Netscape Navigator Etc.)

The problems associated with use of internet are of the following nature:

Security Problem: Internet hackers reveal the password of a user and get unauthorized access to his confidential and sensitive information causing serious damage.

Legal Problem: Question on legal validity of documents transferred through internet communication is a serious one. When communication is beyond formal one where contractual obligation and other legal issues are involved, the problem may pose to be of serious dimension, for example, e-commerce.

Technological Problem: Technological problems are of two kinds. Lack of standardization in communication mode in terms of file type and support software creates problems in effective communication. The other problem is relating to excessive burden in communication channel during peak business hours. In busy hours, the slow speed of Internet causes loss of huge productive time and energy.

Spamming Problem: Spamming means sending unwanted advertisement and marketing information and junk mails to the Internet users. During internet operation this causes delay and load to internet.

Answer:

(c) The concept of E-Commerce is that the consumer can have access to global market, advantage to choose the best, free option to explore the terms and conditions for procurement of an item from different vendor's etc. these can be done sitting at home or office without having the painful exercise of visiting market

and negotiating terms and conditions. The instantaneous gathering of information and providing decision based on pre-determined criteria are to be taken by the system. The components involved in E-Commerce are:

- (a) Customers
- (b) Suppliers
- (c) Service Provider
- (d) Channel partner (distributor)
- (e) Regulatory Authority

The following are the steps by which a transaction in E-Commerce takes place:

- Consumer accesses a shopping mall and selects a shop for purchasing certain items
- Shopping mall services the access to the merchant for a selected shop.
- Merchant system presents the home for a selected shop.
- Consumer selects the desired goods.
- Consumer interacts with the merchant system and makes the payment.
- Merchant system accesses his bank for authorization of the consumer payment.
- Authorization of payment by the bank.
- Merchant system informs the consumer that the payment is accepted and transaction is completed.
- The consumer bank informs the consumer of the money transfer.
- Physical delivery of the items.

2009 - Dec [6] (b) Explain self-regulatory aspect of an Information System.

(3 marks)

(e) Indicate the points to be considered while designing Source Documents.

(4 marks)

Answer :

(b) An information System may have different sub systems interacting with each other in a desired fashion to be operative smoothly and in the process it regulates itself. This is what is self-regulatory nature of the system. A payroll system involves three activities:

First phase, maintaining attendance of employees;

Second phase, pay calculation; and

Third phase, pay disbursement, if the target date for pay disbursement is last date of the month, the second phase of pay calculation adjusts its start time accordingly and the first phase is also regulated in such a fashion that it can provide input to the second phase in time.

Answer:

(e) While designing Source Documents, the following points should be considered:

1. Document should be simple to understand.
2. Each document should have clear title.
3. Each type of document should have a serial number.

4. Different types of documents should be given different colour codes.
5. Layout of document should be of standard size.
6. Item of data should be put in the order of logical sequence.
7. One source document should be used once only to feed data.
8. There should be sufficient space for entering the various data items.

2010 - Dec [7] (a) What is an Interface device? Describe three commonly used Interface devices. (1+3=4 marks)

(b) What is a virus scanner? Describe briefly the functions of a virus scanner. (3 marks)

(c) PQR Ltd. is considering three options to acquire for computerizing one of its important functional areas. The options are :

- (i) Buying the software package available in the market;
 - (ii) Engaging software industries to design the software;
 - (iii) Developing the software in-house with the help of their own IT people.
- Narrate the relative advantages and disadvantages of each option. (6 marks)

Answer:

(a) **Interface device:** Device by which the user interacts with the computer. It is a tool for communication between the various input/output devices and peripherals of a computer system and users.

Commonly Used Interface Devices:

1. **Mouse :** A small pointing input device used with PCs. It rolls on a flat surface and this movement guides the cursor on the display screen. The screen displays a menu. The mouse has also one or more buttons on its top. A top combination of the movement of the mouse and the pressing of button on the mouse, selects the menu item and causes the PC to perform the required operation.
2. **Keyboard :** An input device that contains letters, numbers, special character key, keys that control cursor movement, and keys that can be programmed for other uses.
3. **Trackball :** This is similar to the mouse. A track ball is pointing device that works like an upside-down mouse. The user rests his thumb on the exposed ball and his fingers on the buttons. To move the cursor around the screen, ball is rolled with the thumb. The difference is that unlike the mouse the trackball is fixed on a case on the computer. Trackball is more common in portable computers.

Answer:

(b) **Virus Scanner :** It is a software which neutralizes the effect of virus in the machine/computer. It first detects the presence of virus in a media and then removes the virus from it.

Functions of Virus Scanner:

Virus scanners are special type of software designed to check computer systems

and disks for the presence of various computer viruses. Often the software can eliminate the virus from the infected areas. However, virus scanner software is effective only against viruses already known at the time when software is written. Since new viruses emerge every month, it is better that the organization continually updates its virus scanner software. Some important measures should be taken before obtaining the virus scanner are as follows-

1. Procurement of virus scanners from Reliable Sources
2. Testing New Application on Standalone System.

Answer:

(c) (i) Buying the software package from the market (Buying readymade)

Merits :

- (a) Can be seen and tested
- (b) Will have fewer bugs
- (c) May be less costly
- (d) Implementation time saving
- (e) Documentation/help facility

Demerits :

- (a) May not meet requirements fully
- (b) Enhancement/modifications may be expensive and time consuming
- (c) Requires development, testing and implementation time

(ii) Engaging software industries to design the software (outsourcing)

Merits :

- (a) Better control over schedule and cost
- (b) Does not affect day to day operations due to development work
- (c) Ready skills when new h/w or s/w platforms

Demerits :

- (a) Difficult to negotiate on effort and time required
- (b) Difficult to implement without adequate technical knowledge of the software
- (c) Difficult to maintain after implementation
- (d) Unfamiliarity of the outside party with business may hamper quality

(iii) Development of software in house (built -in- house)

Merits :

- (a) Familiarity with business will lead to better quality
- (b) Will meet requirement fully
- (c) Development of in-house skills
- (d) May make money by selling the software

Demerits :

- (a) Difficulty to adhere to time schedule.
- (b) Additional manpower cost
- (c) Particular skills may not be available

(d) Improvisation according to system followed by others

2011 - June [7] (b) What are the stages of the System Development Life Cycle ?

(c) What are the points to be considered while designing a new source document?

Answer :

(b) System Development Life Cycle: System Development Life Cycle is an approach to analyse and design to ensure that systems are best developed. In fact system development involves seven stages as described below:

1. Identifying problem, opportunities and objectives
2. Determining information requirements
3. Analyzing system needs
4. Designing recommended system
5. Developing and documenting software
6. Testing and maintaining the system
7. Implementing and evaluating the system

Answer:

(c) Designing New Source Documents: While designing source documents, the following points should be considered

- Documents should be simple to understand
- Each document should have clear title.
- Each type of document should have a serial number.
- Different types of documents should be given different colour codes.
- Items of data should be put in the order of logical sequence.
- Layout of documents should be in standard size.
- One source document should be used once only to feed data.

2011 - Dec [6] (a) Briefly describe any five program design tools.

(5 marks)

Answer :

Flowcharts are used in designing and documenting complex processes. Like other types of diagram, they help visualize what is going on and thereby help the viewer to understand a process, and perhaps also find flaws, bottlenecks, and other less-obvious features within it. There are many different types of flowcharts, and each type has its own collection of boxes and notational conventions. The two most common types of boxes in a flowchart are:

- a processing step, usually called activity, and denoted as a rectangular box
- a decision, usually denoted as a diamond.

A flowchart is described as "cross-functional" when the page is divided into different *swimlanes* describing the control of different organizational units. A symbol appearing in a particular "lane" is within the control of that organizational unit. This technique allows the author to locate the responsibility for performing an action or

making a decision correctly, showing the responsibility of each organizational unit for different parts of a single process.

Pseudo code: A programmer who needs to implement a specific algorithm, especially an unfamiliar one, will often start with a pseudo code description, and then "translate" that description into the target programming language and modify it to interact correctly with the rest of the program. Programmers may also start a project by sketching out the code in pseudo code on paper before writing it in its actual language, as a top-down structuring approach.

Program Analysis: This is to understand the user's requirement and logic of the business process to be taken into consideration. The programmer determines the requirement of the system in terms of input data handling, output reports generation and logic involved.

Program Design : In this step, the program is divided into different modules. For each module, algorithm and flow charts are developed to understand how program will work. A document is prepared which is called program specification. Programmer has to use the tools like file layout, input design, output report format and outlines of program logic. All these taken together form the program specification.

Program Coding : In this step, program is written. First, language of the program is selected and then coding of the program is done. The Programming language depends on the following criteria :

- Application area
- Data Structure
- Program logic complexity
- Skill of the programmer etc

Program Debugging : Debugging a program means eliminating errors in the program. Errors may be of two types - (a) Syntax errors and (b) logical errors.

Syntax Errors : These are errors due to mistake in following the syntactical structure of the language in which the program is developed or there may be spelling mistake in the use of words and instruction codes. These errors are detected at the time of compilation with the help of a compiler. Unless the syntax errors are corrected, object program will not be generated.

Logical Errors : These are errors in program logic. These are generally detected at the time of execution or testing the program. Due to logical errors, program may fail to run or will generate wrong output report.

Compilation of Program: Once free from error, the program has to be compiled with the help of compiler of the language chosen. This compiled program is run.

Program Testing : Program testing is part of system implementation. It is done with the help of test data to test the correctness of program logic in terms of data manipulation, file handling and output generation. This testing is done to make the actual

implementation with live data simpler.

Test Data Preparation: Test data is to be prepared to check the correctness of the program.

The following exercises are undertaken in this stage :

- Creation of realistic test data very similar to live data with proper boundary values
- Processing the test data with the help of new software
- Examining the correctness of the reports generated
- Verifying the status of updated files (table) to check correctness
- Identifying the errors and their causes
- Correction in the programs, wherever necessary etc

Debugging and Testing:

Process of eliminating errors and Process of validating the logic of the program-

Debugging	Testing
1. This is a process of eliminating errors.	This is a process of validating the logic of the programme.
2. It is after the program is written.	It is after debugging.
3. It is done with help of compiler or interpreter.	It is done with the test data.
4. It is done to eliminate syntax errors.	It is done to remove logical errors.

After the software is successfully tested with test data, the next step of effective way of testing the system is to make a parallel run of old and new software with the help of same set of live data. The result of both the system is compared to identify the variations. The parallel run must be completed with live data for a considerable period and all reports must be checked to ensure completeness.

2011 - Dec [7] (b) What is Integration Testing? What are the different strategies adopted for this? What are the types of testing approach? How does the auditor satisfy himself in this regard? (1 + 1 + 2 + 1 = 5 marks)

Answer :

Integration Testing:

Integration testing refers to evaluation of groups of program modules to determine whether:

- interfaces are working properly,
- specified requirements are met,
- there is any degeneration under high workloads, and
- processing is carried out efficiently.

Strategies adopted for Integration testing-

There may be two different strategies viz.

1. big-bang testing
2. incremental testing

Testing Approach- There may be three types of integration testing approach:

1. **Top-down test:** Top level modules are tested first by simulating lower-level dummy modules to confirm the working of the interface correctly.
2. **Bottom-up test:** Bottom level modules are tested first by simulating higher-level dummy modules to confirm correctness of the working of the interface.
3. **Hybrid test:** It is a combination of top-down and bottom-up test. This is also known as sandwich testing.

Satisfaction of auditor- Auditor should gather evidence of integration testing and check whether systematic approach was adopted and execution was carried out properly.

2012 - June [6] (a) Briefly define Information System Infrastructure and its basic components. (1 + 3 = 4 marks)

(b) A company is planning to procure hardware and asks you to advise on the options available before them for hardware procurement. Please list out the options and comparative advantages for each option.

(2 + 4 = 6 marks)

Answer :

(a) **Information System Infrastructure:** Information System Infrastructure means the physical resources and organizational support required for operation of an information system. Information infrastructure is a technical structure of an organizational form, an analytical perspective or a semantic network. Information infrastructures include the Internet, health systems and corporate systems.

It consists of following six basic components:

- (i) **Hardware:** A physical component of a computer, such as electronics, electrical and mechanical units is known as the hardware of the computer. Hardware includes terminals, processors, storage devices and communication networks.
- (ii) **Software:** It is the instruction given to the computer to perform the desired task. In other words, software is complete set of instructions written to solve a problem on a computer.
- (iii) **Database:** A database is an organized collection of data.
- (iv) **Network:** A network is a technique which allows sharing of resources and information through physical connections and computer programs.
- (v) **People:** Human resources to make the system operational.
- (vi) **Reports:** Reports are generated by the software with the help of databases for the use by users.

Answer:

(b) Hardware Procurement -Hardware may be procured with the following options:

1. Outright Purchase
2. On Rent
3. On Lease
4. Hire Purchase

Comparative advantages of each option:

When we decide to acquire computer hardware, we have a choice among buying outright, on rent, on lease or hire purchase. The route we follow will depend on our business needs, our budget and the level of advice and support we need.

1. Outright Purchase: Outright purchase means buying of computer hardware for own use. The advantage in outright purchase is flexibility in the use of the machine according to the need of the organization. Moreover, small businesses are able to deduct a percentage of the value of their IT investments from their taxable income. This includes hardware, software and mobile phones. Tax benefit on depreciation is another point which encourages the users to go for outright purchase.

2. Hardware is procured on rent for the following advantages:

1. Cash outlay for procurement is avoided.
2. Decreased Investment Expenditure
3. No Maintenance Worries
4. No Shock Expenditure
5. Improved Budget
6. Rent is allowable expense for tax
7. Risk of obsolescence is not with the user.

3. Procurement on Lease is opted in case machine is of high configuration and seller is generally the manufacturer.

Leasing computer hardware -Advantages of hire purchase or leasing of hardware equipment include:

- (a) Financial flexibility** - you can spread the cost of your equipment over a period of time so its impact on your cashflow is less severe.
- (b) Tax benefits** - as with purchasing, leasing can also offer tax benefits. Businesses can usually deduct the full cost of lease rentals from taxable income. Consult your accountant for specialist advice in this area. See our guide on how to choose and work with an accountant.
- (c) An integrated maintenance** contract and replacement equipment (in the event of total failure), often as part of the deal.
- (d)** The possibility of a periodic upgrade or replacement with new equipment as part of the package, keeping your office technology up to date.

4. Hire Purchase option is normally not used as Computer becomes outdated very fast. This option is exercised only to avoid immediate investment for procurement.

2012 - Dec [7] (b) (i) What is meant by “user friendly” software? What is a “menu” in software? (2 + 2 = 4 marks)

- (ii) Briefly describe any four program design tools. (4 marks)

Answer :

(i) User friendly Software:

User friendly Refers to anything that makes it easier for novices to use a computer. Menu-driven programs are considered more user-friendly than command-driven systems. Graphical user interfaces (GUIs) are also considered user-friendly. In other words any software systems that are supposedly easy for a user to learn operate without requiring a great deal of specialized knowledge or training.

A menu is a list of commands or options from which you can choose. It provides the user with options to choose from just like a menu in a restaurant provides the customers a choice of items.

An example of menu is as follows:

New
Open
Save
Save as
Print
Prepare
Send
Publish
Close

- (ii) Please refer 2011 - Dec [6] (a) on page no. 258

2013 - June [6] (d) Explain DSS. What are its characteristics? Narrate the components of DSS. (2 + 3 + 3 = 8 marks)

Answer:

Decision Support System (DSS):

Decision support system refers to a problem solving system with close interaction between a man and a machine. DSS refers to both hardware and software, is flexible and interactive, and supports simulation.

Decision Support System (DSS) combines hardware and software to aid decision making functions of the management. There should be an organization structure with various levels of management who are in need of tools that can assist them in dealing with structured, semi-structured, and unstructured problems and predict the outcome of future courses of actions.

Characteristics of Decision Support System :

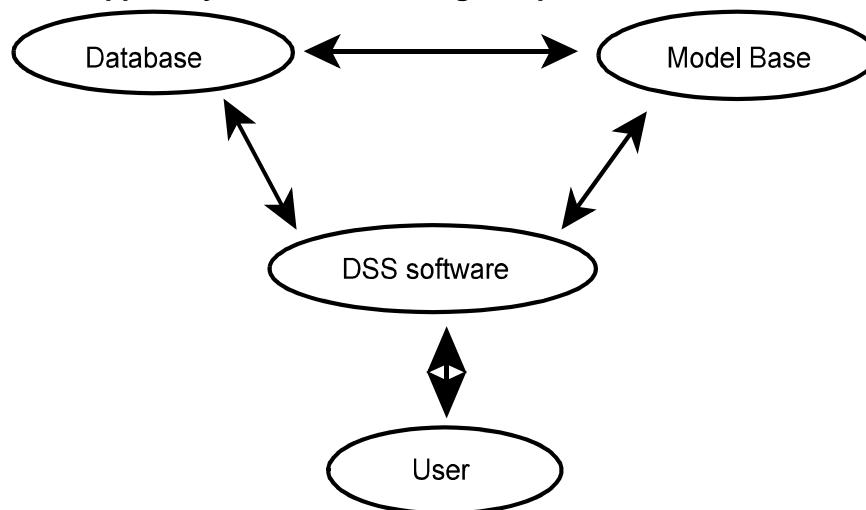
- (i) Support semi-structured and unstructured decision making.
- (ii) Use model for solutions.
- (iii) Flexible to respond the changing need of the decision maker.

A structured decision is one which is preplanned and pre specified. It is programmed in the sense that unambiguous decision rules can be specified in advance.

Unstructured or semi structured are not preplanned or pre-specified and tend to be non-routine. DSSs are more suitable in the case of unstructured or semi-structured decisions. It involves great technical expertise of the all subjects of all related fields and building model to handle the information to deprive solution set.

Components of DSS:

The Decision Support System has following components:



1. **User:** Decision making in an organisation can be classified into three levels, namely, the strategic, the managerial and operational. Most of the unstructured decisions are made at the strategic or top management. Upper level managers and chief executives are the main users of DSS.
2. **Databases:** Database is a collection of data that is organized in such a way that it corresponds to the needs and structure of an organisation and which can be used for more than one application. DSS allows the decision maker to retrieve data and test alternative solution in the process of decision making.
3. **DSS software:** DSS software permits easy interaction among the user and database and model base. DSS software's meant for relatively higher level management who may not be experts in handling computers. DSS software system manages the creation of models, storage of models, and retrieval of models

from the model base and integrates them with data in the database.

4. **Data base:** Model base is brain of DSS. A model base is a collection of mathematical and analytical models which could be accessed by the DSS users.

2013 - Dec [7] {C} (a) What is a Deterministic type of System? (2 marks)

Answer :

Deterministic type of System:

A system in which the output can be predicted with 100 percent certainty. An example is a correct computer program, which performs exactly according to a set of instructions.

2013 - Dec [9] Discuss the areas which would help in analyzing/investing the Present System. (8 marks)

Answer :

The following areas would help in analyzing/investing the Present System:

(a) **Review historical aspects:**

A review of annual reports and organization chart can identify the hierarchy of management levels. The historical facts should identify the major turning points that have influenced its growth; the system analyst should also investigate what system changes have occurred in the past.

(b) **Analyze inputs:**

Source documents are used to capture the originating data. The system analyst should study in depth various sources from where the data are initially captured to understand the existing system. The system analyst must understand the nature of each form, the distribution of the form.

(c) **Review data files maintained:**

The analyst should investigate the data files maintained by each department and should know where they are located, who uses them. System and procedural manual should also be checked.

(d) **Review methods, procedures and data communications:**

System analyst must review the types of data communication equipments including data interface, data links, modems, dial-up and leased lines and multiplexers to understand how the data communication network is used in the present system. A procedure's review is an intensive survey of the methods by which each job is accomplished, the equipment utilized and the actual location of the operations.

(e) **Analyze outputs:**

The outputs or reports should be scrutinized carefully by the system analysts in order to determine whether they meet the organization's needs.

(f) **Review internal controls:**

A review of the present system of internal controls may indicate weaknesses that should be removed in the new system. Locating the control points helps the analyst to visualize the essential parts and framework of a system.

(g) **Undertake overall analysis of present system:**

Based upon the aforesaid investigation of the present information system, the final phase of the detailed investigation includes the analysis of the present work volume, the current personnel requirements, the present benefits and costs and each of these must be investigated completely.

2013 - Dec [10] (b) Briefly explain the fact finding techniques used by the system analyst to find the needs of an organisation. (4 marks)

Answer :

The following are the fact finding techniques used by the system analyst for determining the needs/ requirements of an organization:

Background Reading:

If an analyst is employed within the organization that is the subject of the fact gathering exercise, then it is likely that he or she will already have a good understanding of the organization and its business objectives.

Interviewing:

Interviewing is probably the most widely used fact finding technique; it is also the one that requires the most skill and sensitivity. Because of this, we have included a set of guidelines on interviewing that includes some suggestions about etiquette.

Observation:

Observation also allows the analyst to see what information people use to carry out their job. This can tell you about the documents they refer to, whether they have to get up from their desks to get information, how well the existing system handles their needs.

Questionnaires:

Questionnaires are research instruments that can be applied to fact finding in system development projects. They consist of a series of written questions. The questionnaire designer usually limits the range of replies that the respondent can make by giving them a choice of options. Using questionnaires, a large amount of data can be collected easily.

Document Sampling:

Document sampling can be used in two different ways. Firstly, the analyst will collect copies of blank and completed documents during the course of interviews and observation sessions. These will be used to determine the information that is used by people in their work, and the inputs to and outputs from processes which they carry out, either manually or using an existing computer system.

2014 - June [8] (a) "After the identification of the problem, objectives of the proposed solution can be defined." What are the questions that should be answered while stating the solution? (3 marks)

Answer :

Identification of Problem:

After the identification of the problem, objectives of the proposed solution can be defined.

For instance, inability to provide a convenient reservation system, for a large number of intending passengers was the major problem of the Railways, Airways and long run tourist buses. So it was the basic objective "to introduce a system wherein intending passengers could book a ticket from source to destination, faster than in real-time."

The following questions should be answered while stating the solution:

1. What functionalities will be delivered through the solution?
2. What data is required to achieve these functionalities?
3. What are the control requirements for this application?
4. What level of response time, execution time and throughput is required?
5. Is there any special hardware/software that the application has to interface with?
For example-Payroll application may have to capture from the attendance monitoring system that the company installs.
6. The reliability required for an application depends on its criticality and the user profile.

2014 - June [12] Explain the following terms:

- (d) Expert System;
(e) Different parts of a Decision Table; (2 marks each)

Answer :

(d) Expert System: An Expert System is a knowledge based system which acts as an expert in devising solutions. An expert system acts in a specific area only with the support of knowledge database on this specific area. Knowledge data base means structured information stored on previous solution sets in unstructured problem situations. In other words, an expert system operates on previous experience which is stored in a database. Even the present solution devised from the system and the information on its outcome will also be stored.

Answer:

(e) The four parts of the decision table are as follows:

- (i) Condition Stub - lists the comparisons or conditions;
- (ii) Action Stub - lists the actions.
- (iii) Condition entries - list in its various columns the possible permutations.
- (iv) Action entries - lists, in its columns corresponding to the condition entries the actions contingent upon the set of answers to questions of that column.

2014 - Dec [1] Answer the question:

- (h) Expand CASE and list various CASE tools. (2 marks)

Answer:

CASE stands for Computer Aided Software Engineering.

Classic CASE tools : established software development support tools (e.g. interactive debuggers, compilers, etc.)

Real CASE tools: can be separated into three different categories, depending on where in the development process they are most involved in:

- (i) **Layout form and Screen Generator**: They are for printed report used to format or paint the desired layouts.
- (ii) **Menu Generator**: Menu generator outlines the functions.
- (iii) **Report Generator**: It indicate totals, paging, sequencing and control breaks in creating samples of the desired report.
- (iv) **Code Generator**: It allows the analyst to generate modular units of source code.

2014 - Dec [3] (a) Answer the question:

- (i) State the important factors which should be considered while designing the user outputs. (6 marks)
- (b) (iii) List major categories of Flow Charts. What are the benefits of Flow Charts and limitations of using these Charts?

(2 + 2 + 2 = 6 marks)

Answer:

(a) (i) **Important factors which should be considered while designing the user outputs:**

These are the important factors which should be considered by the system analyst while designing user outputs.

- (a) **Content**: Only the required information should be included in various outputs because too much content can cause managers to waste time in selecting the information that they need. For example, the contents of a weekly report of a sales manager might consist of sales persons and the amount of each product sold by each sales person.
- (b) **Form**: Content can be presented in various forms-quantitative, non-quantitative, text, graphics, video and audio. Many managers prefer summary information in chart form such as pie chart, line chart, bar chart.
- (c) **Output volume**: It is better to use high-speed printers which are fast in case the volume is heavy.
- (d) **Timeliness**: Some outputs are required on a regular, periodic basis - perhaps daily, weekly, monthly, at the end of a quarter or annually.
- (e) **Media**: A variety of output media are available in the market are- video display, microfilm, magnetic tape/disk and voice output.
- (f) **Format**: The manner in which data are physically arranged is referred to as format.

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Answer:

(b) (iii) **Flowcharts are divided into four major categories:**

1. **Document flowchart:** showing a document-flow through systems.
2. **Data flowchart:** showing data flows in a system.
3. **System flowchart:** showing controls at a physical or resource level.
4. **Program flowchart:** showing the controls in a program in a system.

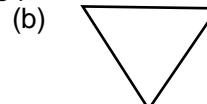
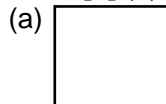
Benefits of Flowchart

- It provides an easy way of communication because any other person besides the programmer can understand the way they are represented.
- It represents the data flow.
- It provides a clear overview of the entire program, problem and solution.
- It checks the accuracy in logic flow.
- It documents the steps followed in an algorithm.
- It provides the facility for coding.
- It provides the way of modification of running program.
- It shows all major elements and their relationship.

Limitations of Using Flowcharts

- a. Flow-charts consume time and it is laborious to draw with proper symbols. Even though it is easy to draw a flow-chart for small problems, but when it comes to draw flow-charts for complex problems it becomes tedious.
- b. If alterations are required, the flowchart may require redrawing completely.
- c. As the flowchart symbols cannot be typed, reproduction of flowchart becomes a problem.

2015 - June [2] (b) (i) Give the meaning of following process flowchart symbols:



(2 marks)

Answer:

(a) **Inspection:** Examination of an object to check on quality or quantity characteristic.

(b) **Storage:** Retention of an object in allocation awaiting next activity.

2015 - June [3] (a)(ii) List the activities involved in the Information System Department.

(3 marks)

(c) (i) Expand CASE. What is its role? Write a line on each CASE tool to clarify its function. (1+ 1+ 4 = 6 marks)

Answer:

(a) (ii) **Activities involved in the Information System Department are:**

1. System Development

2. Programming
3. Data administration
4. Security management
5. Operation management
6. Quality assurance.

Answer:

(c) (i) *Please refer 2014 - Dec [1] (h) on page no. 270*

2015 - Dec [3] Answer the questions:

- (a) (i) State the advantages of System Development Life Cycle from the perspective of IS Audit. (3 marks)
- (ii) Define Flow-Chart and list major categories of flow-charts. (1+ 3 = 4 marks)
- (b) (iv) You are appointed as a System Analyst and assigned system analysis of the organisation. Discuss various fact finding techniques which are used for this purpose. (4 marks)

Answer:

(a) (i) Advantages of System Development Life Cycle from the perspective of IS audit:

- (a) The IS auditor can have clear understanding of the various phases if SDLC on the If the detailed documentation maintained during each phase of the SDLC.
- (b) The IS Auditor on the basis of his examination, can state in his report about the compliance by the IS management of the procedures, if any, set by the management.
- (c) The IS Auditor, if has a technical knowledge and ability of the area of SDLC, the IS Auditor can guide during the various phases of SDLC.
- (d) The IS Auditor can also provide an evaluation of the methods and techniques used through the various development phases of the SDLC.

(ii) Flowcharts: Flowcharting is a graphic technique that can be used by analysts to represent the inputs, outputs and processes of a business in a pictorial form.

Major categories of Flow Chart:

- **Document flowchart** : showing a document- flow through systems.
- **Data flowchart** : showing data flows in a system.
- **System flowchart** : showing controls at a physical or resource level.
- **Program flowchart** : showing the controls in a program in a system.

(b) (iv) Fact finding Techniques: which are used by the system analyst are as follows:

- (i) **Documents:** Analysts collect the hierarchy of users and manager responsibilities, job descriptions for the people who work with the current system, procedure manuals, program codes for the applications

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- associated with the current system to understand the existing system.
- (ii) **Questionnaires:** Users and managers are, asked to complete questionnaire about the problems with the existing system and requirement of the new system. Using questionnaires, a large amount of data can be collected fastly.
 - (iii) **Interviews:** Users and managers may also be interviewed to extract information in depth.
 - (iv) **Observation:** Observation plays a key role in requirement analysis. Only by observing how users react to prototypes of a new system, the system can be successfully developed.

2016 - June [III] Answer the question:

2. (b) State the advantages of using pre-written application packages.

(4 marks)

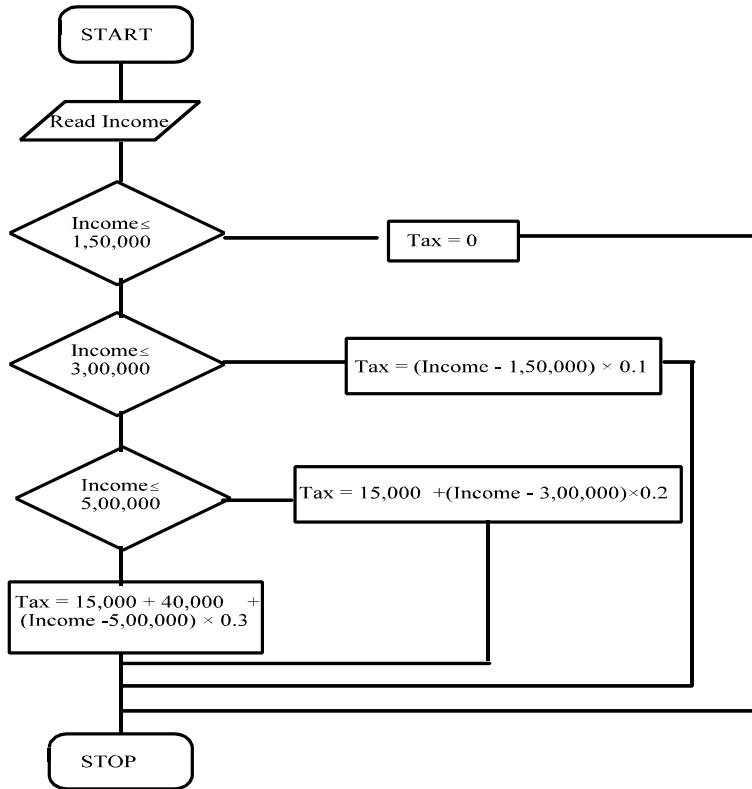
PRACTICAL QUESTIONS

2008 - Dec [7] (d) Q. File and Smile Online asks you to draw a flow-chart for calculation of income tax as per slabs prescribed which are as below:

Salary in currency limit	Rate %
Up to 1,50,000	Nil
1,50,001 to 3,00,000	10
3,00,001 to 5,00,000	20
5,00,001 and above	30

(4 marks)

Answer :



2008 - Dec [8] (d) Fill up the following missing blocks which form part of the system development team in a System Development Life cycle. Write missing answer against Serial Number only in the answer sheet :

Sl. No.	Step	Person Responsible	Responsibility
1	System proposal	?	Study requirement and prepare proposal for clearance by management.
2	Systems Implementation	Programmer and Systems Analyst	?
3	?	Programmers	To develop programs according to systems specifications and testing the programs.

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(3 marks)

Answer :

Sl. No.	Step	Person Responsible	Responsibility
1	System proposal	System Analyst	Study requirement and prepare proposal for clearance by management
2	Systems Implementation	Programmer and Systems Analyst	Implementation of the live data
3	Program Development	Programmers	To develop programs according to systems specifications and testing the programs.

2011 - Dec [6] (b) A Company sells merchandise to wholesale and retail outlets. Wholesale customers receive a 2% discount on all orders. The company also encourages both wholesale as well as retail customers pay cash on delivery by offering a 2% discount for this method of payment. Another 2% discount is offered on orders of 500 or more units for all. Draw a decision table for the above conditions and actions.

Answer :

Decision Table

		Rules							
		1	2	3	4	5	6	7	8
Condition Stub	Order 500 units or more	Y	Y	Y	Y	N	N	N	N
	Wholesale Outlet	Y	N	Y	N	Y	N	Y	N
	Cash on delivery	Y	N	N	Y	Y	Y	N	N
Action Stub	Offer no discount								√
	Offer 2% discount		√				√	√	
	Offer 4% discount			√	√	√			
	Offer 6% discount	√							

Number of Rules = $2^n = 2^3 = 8$ (n = no. of conditions)

2012 - June [6] (d) In a disk pack, number of tracks in each surface is 200 and number of sectors in each track is 22. If there are 10 Nos. of recording surfaces and 500 bad sectors in the disk pack, calculate total number of good sectors. (2 marks)

Answer:

No. of tracks per surface = 200

No. of sectors per track = 22

No. of recording surfaces = 10

Therefore, total number of sectors = $200 \times 22 \times 10 = 44,000$

No. of bad sectors = 500

Therefore, no. of good sectors = $44,000 - 500 = 43,500$

2012 - Dec [6] (c) XYZ Company Pvt. Ltd. extends special discount to its distributors who have business relation for more than 8 years or have business relation for more than 3 years and volume of business is more than ₹ 10 lakhs. Draw the Decision Table. (3 marks)

Answer :

Decision Table for Conditions and Actions:

Discount = Yes,

IF
 Business Relations for more than 8 years
 OR
 Business Relations for more than 3 years
 AND
 Volume of Business is more than ₹ 10 lakhs

		Rules							
		1	2	3	4	5	6	7	8
Condition Stub	C1: more than 8 years of business relation	Y	Y	Y	Y	N	N	N	N
	C2: more than 3 years of business relation	Y	Y	N	N	Y	N	N	N
	C3: business volume more than ₹10 Lakhs	Y	N	Y	N	Y	N	Y	N
Action Stub	A1: Discount facility	X	X	X	X	X			
	A2: No Discount facility						X	X	X

2013 - June [6] (c) In a disk pack, number of tracks in each surface is 200 and number of sectors in each track is 20. If there are 10 Nos. of recording surfaces and 600 bad sectors in the disk pack, calculate total number of good sectors. (2 marks)

Answer:

Number of tracks per surface = 200

Number of sectors per track = 20

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Number of recording surfaces =10

Therefore, total number of sectors = 200 x 20 x 10 = 40,000

Number of bad sectors = 600

Therefore, no. of good sectors =40,000 - 600 = 39,400

2015 - June [2] Answer the questions.

(a) (i) A work sampling study was performed on the activities of the customer care executives in a service organisation. The observations are as under:

Activity	No. of observations
A1	250
A2	60
A3	100
A4	160
A5	50
A6	60
A7	50
A8	70
Total	800

The management of the organisation plans to eliminate activity "A4" by acquiring an EDP system. This, it is felt, will enable the executives' time to be better utilised. While the executives' salary on an average in ₹ 4,000 per month (25 working days), the volume of their time utilised (i.e. for more customer-care) is put at three times what their salary reflects. There are 200 executives in the organisation and the EDP system is going to cost ₹ 75,000 a month covering the initial investment as well as operation expenses. Should the organisation go in for the EDP system? (6 marks)

Answer:

As per the work sampling data, 160 out of a total of 800 observations are made for the activity, 'A4' – i.e., the latter activity occupies 160/800 fraction of an executive's time. This means $160/800 \times (4,000)$ is being spent monthly per executive on doing activity A4. For 200 executives, this amount works out to = $160 / 800 \times (4,000) \times (200) = ₹ 1,60,000$.

Notably this expenditure exceeds the amount that would be spent on the EDP system. Thus, if the number of executives could be reduced proportionate to the elimination of activity A4 done by them, the EDP system can be installed. This approach considers the

employment of executives as 'necessary expenditure'.

Another approach would be to look at the executives' contribution to customer care. If 160/800 fraction of the time is released for additional customer care, the contribution in this area would be equivalent to: $(160/800) \times 3 \times 4000 \times (200) = ₹ 4,80,000$. (Fraction of time additionally available $\times 3 \times$ (Rupee Value) \times (Number of executives). This, again, argues in favour of installing the EDP system.

Repeatedly Asked Questions		
No.	Question	Frequency
1	Explain the Expert System? 12 - June [8] (c), 14 - June [12] (d)	2 Times
2	Write short 'Open and Closed systems' 2007 - Dec [8] (f), 2016 - June [1] (a)	2 Times

Table Showing Marks of Compulsory Questions										
Year	11 D	12 J	12 D	13 J	13 D	14 J	14 D	15 J	15 D	16 J
Descriptive					2					
Total					2					