The Institute of Chartered Accountants of Nepal

Suggested Answers of Management Information and Control System

CAP III Examination- December 2012

1.

a) Explain how different hierarchy of management will be benefitted with the computer based Information System. **10**

b) What do you mean by Decision Support System (DSS)? Describe DSS with a relevant example of its application to sales and marketing. **10**

Answer:

a) Computer based information system is the integrated form Information Technology which collects the data from different sources, process those data to generate the information and thus obtained information optimizes the organizational procedures. It provides customized information to different hierarchy of management as and when required.

There are three level of management hierarchy which uses information system to enhance their efficiency. Those levels are:

i. Top Level Management
ii. Middle Level Management
iii. Operational Level Management

Top Level Management:

Tope level management is defined as a set of management position which is concerned with the overall task designing, directing and managing the organization in an integrated manner. In broader sense the job of top level management can be categorized in two ways: external and internal.

Computer based information provides following types of information to the top level management.

- analysis of the competitive activities related with the rivalry
- analysis of customer preferences
- analysis economic trends, legal rulings and technological changes
- analysis of historical sales, costs and other relevant parameters
- analysis profit, cash flow, divisional income, sales, expenses
- analysis financial ratios, interests; credit outstanding etc

Middle Level Management (Tactical Level):

Middle management is defined as group of management position which trend to overlap the top and operational management level. Middle level management is mainly focused on supervision and monitoring of the operations and the administrative work in the sense that it is responsible for the elaboration, classification and maintaining operation of organization goals. Following information are provided the IS to the middle level management to enhance their performance.

- Information about the price changes, shortages of products and raw materials,
- Information about the demand and supply, credit conditions
- Organizational performance indicators, over-under budgets
- Information about the sales, incomes, profits/loss etc.

Operational Level Management:

The operational level of management is defined as the group of those management staffs which are responsible to carry out the day to day works and the execution of the actual operation of office. The operational level management mainly concerned with the implementing operational plans, policies and procedures for the purposes of conversion of inputs and outputs. IS provides following information to the operational level management.

- Customer details, staffs details, products details.
- Units sales, expenses, stocks, staffs attendances.
- Current performances, operational level efficiencies and inefficiencies, input-output ratios, maintenance reports. Etc.

b) Decision support system is a computer-based information systems that provide interactive information support to managers and business professionals during the decision-making process using the following to make semi structured business decisions

- Analytical models
- Specialized databases
- A decision maker's own insights and judgments
- An interactive, computer-based modeling process

Decision support system itself is not a decision maker nordoes it replace human managers from decision making. It provides the analysis about the problem from various prospects and it's the duty of the human managers to choose the decision based upon all those. Thus, DSS is that type of system which supports managers while solving the semi-structured problems by providing the options from different prospects. DSS gives the analysis based upon the mathematical/ statistical model.

Here is an example of use of DSS in sales and marketing.

The total units of sales are assumed to be the function of following parameters (not only this):

- Incentives to the sales persons
- Promotion

- Rivalry
- Quality of product
- Customer economic status

These parameters do not have equal weightage while determining the sales. Thus the total units sales will be the products of the weightage and the variables. The product of weightage factors and variable will be the mathematical model for the DSS. Now the analysis can be done based upon this model.

Now decision maker can make the analysis with the help of DSS by changing the cost of promotion on sales. Similarly the effect of sales can be analyzed with the change in the incentives to the sales persons. At the same time, the effect of more than one parameters also can be checked.

2.

a)	Explain IT strategy planning.	**5**
b)	Explain feasibility study.	**5**
c)	Explain Computer Aided Software Engineering (CASE).	**5**
d)	Explain the waterfall model of software development.	**5**

Answer:

a) A plan is a predetermined course of action to be taken in the future. It is a document containing the details of how the action will be executed, and it is made against a time scale. The goats and the objectives that a plan is supposed to achieve are the pre-requisites of plan. The setting of the goals and the objectives is the primary task of the Management without which planning cannot begin.

Planning involves a chain of decisions, one dependent on the other, since it deals with a long term period. A successful implementation of a plan means the execution of these decisions in a right manner one after another.

Planning, in terms of future, can be long-range or short-range. Long-range planning is for a period of five years or more, while short-range planning is for one year at the most. The long-range planning is more concerned about the business as a whole, and deals with subjects like the growth and the rate of growth, the direction of business, establishing some position in the business world by way of a corporate image, a business share and so on. On the other hand, short-range planning is more concerned with the attainment of the business results of the year. It could also be in terms of action by certain business tasks, such as launching of a new product, starting a manufacturing facility, completing the project, achieving intermediate milestones on the way to the attainment of goals. The goals relate to long-term planning and the objectives relate to the short-term planning. There is a hierarchy of objectives which together take the company to the attainment of goals. The plans, therefore, relate to the objectives when they are short-range and to goals when they are the long-range.

Long-range planning deals with resource selection, its acquisition and allocation. It deals with the technology and not with the methods or the procedures. It talks about the strategy of achieving the goals. The right strategy improves the chances of success tremendously. At the same time, a wrong strategy means a failure in achieving the goals.

Corporate business planning deals with the corporate business goals and objectives. The business may be a manufacturing or a service; it may deal with the industry or trade; may operate in a public or a private sector; may be national or international business. Corporate business planning is a necessity in all cases. Though the corporate business planning deals with a company, its universe is beyond the company. The corporate business plan considers the world trends in the business, the industry, the technology, the international markets, the national priorities, the competitors, the business plans, the corporate strengths and the weaknesses for preparing a corporate plan. Planning, therefore, is a complex exercise of steering the company through the complexities, the difficulties, the inhibitions and the uncertainties towards the attainment of goals and objectives.

b) **Feasibility** is the measure of how beneficial or practical the development of the Life cycle an information system will be to an organization.

Feasibility analysis is the process by which feasibility is measured.

Feasibility should be measured throughout the life cycle. In earlier chapters we called this a creeping commitment approach to feasibility. The scope and complexity of an apparently feasible project can change after the initial problems and opportunities are fully analyzed or after the system has been designed. Thus, a project that is feasible at one point may become infeasible later. Let's study some checkpoints for our systems development life cycle.

If you study your company's project standards or systems development life cycle (SDLC), you`ll probably see a feasibility study phase or deliverable, but not an explicit ongoing process. But look more closely! On deeper examination, you'll probably identify various go/no-go checkpoints or management reviews. These checkpoints and reviews identify specific times during the life cycle when feasibility is reevaluated. A project can be canceled or revised in scope, schedule, or budget at any of these checkpoints. Thus, an explicit feasibility analysis phase in any life cycle should be considered to be only an initial feasibility assessment.

Feasibility checkpoints can be installed into any SDLC that you are using. The checkpoints are represented by red diamonds. The diamonds indicate that a feasibility reassessment and management review should be conducted at the end of the prior phase (before the next phase). A project may be canceled or revised at any checkpoint, despite whatever resources have been spent.

This idea may bother you at first. Your natural inclination may be to justify continuing a project based on the time and money you've already spent. A fundamental principle of management is never to throw good money after bad—cut your losses and

move on to a more feasible project. That doesn't mean the costs already spent are not important. Costs must eventually be recovered if the investment is ever to be considered a success.

c) Computer-aided software engineering (CASE)—sometimes called computer-aided systems engineering—provides software tools to automate the methodologies we have just described to reduce the amount of repetitive work the developer needs to do. CASE tools also facilitate the creation of clear documentation and the coordination of team development efforts. Team members can share their work easily by accessing each other's files to review or modify what has been done. Modest productivity benefits can also be achieved if the tools are used properly. Many CASE tools are PC-based, with powerful graphical capabilities.

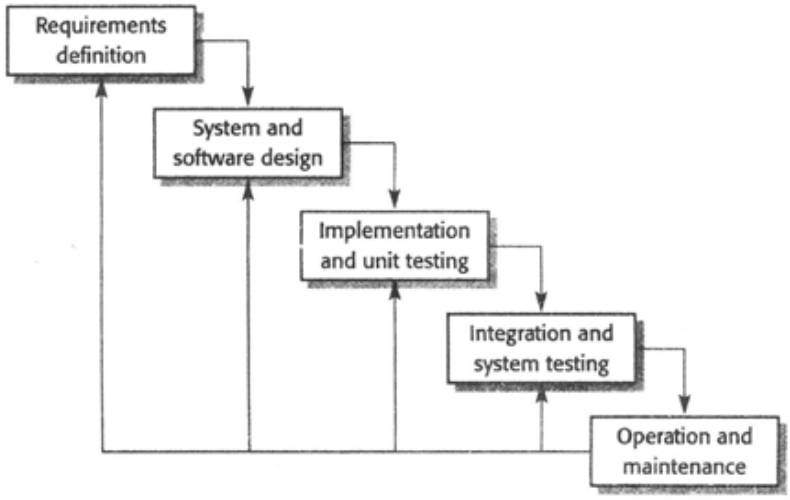
CASE tools provide automated graphics facilities for producing charts and diagrams, screen and report generators, data dictionaries, extensive reporting facilities, analysis and checking tools, code generators, and documentation generators. In general, CASE tools try to increase productivity and quality by doing the following:

- Enforce a standard development methodology and design discipline
- Improve communication between users and technical specialists
- Organize and correlate design components and provide rapid access to them using a design repository
- Automate tedious and error-prone portions of analysis and design
- Automate code generation and testing and control rollout

CASE tools automatically tie data elements to the processes where they are used. If a data flow diagram is changed from one process to another, the elements in the data dictionary would be altered automatically to reflect the change in the diagram. CASE tools also contain features for validating design diagrams and specifications. CASE tools thus support iterative design by automating revisions and changes and providing prototyping facilities. A CASE information repository stores all the information defined by the analysts during the project. The repository includes data flow diagrams, structure charts, entity-relationship diagrams, UML diagrams, data definitions, process specifications, screen and report formats, notes and comments and test results.

d) The first published model of the software development process was derived from other engineering processes (Royce, 1970). Because of the cascade from one phase to another, this model is known as the `waterfall model' or software life cycle. The principal stages of the model map onto fundamental development activities:

- Requirements analysis and definition: The system's services, constraints and goals are established by consultation with system users. They are then defined in detail and serve as a system specification.
- System and software design: The systems design process partitions the requirements to either hardware or software systems. It establishes overall system architecture. Software design involves identifying and describing the fundamental software system abstractions and their relationships.
- Implementation and unit testing: During this stage, the software design is realized as a set of programs or program units. Unit testing involves verifying that each unit meets its specification.
- Integration and system testing: The individual program units or programs are integrated and tested as a complete system to ensure that the software requirements have been met. After testing, the software system is delivered to the customer.
- Operation and maintenance: Normally (although not necessarily) this is the longest life-cycle phase. The system is installed and put into practical use. Maintenance involves correcting errors which were not discovered in earlier stages of the life cycle, improving the implementation of system units and enhancing the system's services as new requirements are discovered.



In principle, the result of each phase is one or more documents which approved (`signed are off'). The following phase should not start until the previous phase has finished. In practice, these stages overlap and feed information to each other. During design, problems with requirements are identified, during coding design problems are found and so on. The software process is not a simple linear model but involves a sequence of iterations of the development activities.

Because of the costs of producing and approving documents, iterations are costly and involve significant rework. Therefore, after a small number of iterations, it is normal to freeze parts of the development, such as the specification, and to continue with the later development stages. Problems are left for later resolution, ignored or are programmed around. This premature freezing of requirements may mean that the system won't do what the user wants. It may also lead to badly structured systems as design problems are circumvented by implementation tricks.

During the final life-cycle phase (operation and maintenance) the software is put into use. Errors and omissions in the original software requirements are discovered. Program and design errors emerge and the need for new functionality is identified. The system must therefore evolve to remain useful. Making these changes (software maintenance) may involve repeating some or all previous process stages.

The problem with the waterfall model is its inflexible partitioning of the project into these distinct stages. Commitments must be made at an early stage in the process and this means that it is difficult to respond to changing customer requirements. Therefore, the waterfall model should only be used when the requirements are well understood. However, the waterfall model reflects engineering practice. Consequently, software processes based on this approach are still used for software development, particularly when this is part of a larger systems engineering project.

3.

a) Prepare sample report format which shows the sales of Wai-Wai noodles in five regions of the country for the month of July. It should be able to show the percentage of the target achieved in each region and overall percentage of target achieved. **5**

b) Explain about the moral dimension of Information Technology. 5

c) Explain about the role of system designer and system developer in the context of system development. **5**

Answer:

a)

Product Code	**Product Description**	**Sales Region**	**Actual Sales**	**Planned**	**Actual Versus Planned**
112	Wai-Wai Noodles	Central	450123	400124	1.124958763
		Mid-Western	340045	334400	1.016880981
		Western	451112	550000	0.820203636
		Central	400000	350000	1.142857143
		Eastern	331122	400001	0.82780293
Total (Avg)			1972402	2034525	0.986540691
Total (Avg)			1359437	1442222	1.00007829

b)

- Information rights and obligations: What information rights do individuals and organizations possess with respect to information about themselves? What can they protect? What obligation do individuals and organization have concerning this information?
- Property rights: How will traditional intellectual property rights be protected in a digital society in which tracing and accounting for ownership is difficult, and ignoring such property rights is so easy?
- Accountability and Control: Who can and will be held accountable and liable for the harm done to individual and collective information and property rights?
- System Quality: What standards of data and system quality should we demand to protect individual rights and the safety of society?

Quality of Life: What values should be preserved in information and knowledge based society? What institutions should we protect form violation? What cultural values and practices are supported by the new information technology?

c) System Designer and System Developer have different responsibilities from the prospect of the system development. Their roles in the process of system development are explained in the tabular form below:

SN	**System Designer**	**System Developer**
1.	System designer mainly responsible for making the pictorial representation of the system before it is built.	System Developer is mainly responsible to build or write the program codes.
2.	System Designer makes the design based upon the detail requirement analysis.	The system developer or programmer writes the codes based upon the design given by the system designer
3.	The designing process of may be iterative till the finalization of requirement analysis.	During the development process the re-writing of the codes can be done to remove the bug.

4.	System designer can use various CASE tools.	System developer can also use the CASE tools while writing the program codes

4.

a) Define e-commerce. Explain the secure electronic payment system with many payment alternatives. **(2+5=7)**

b) Define Supply Chain Management system. Why SCM strategy is important for an organization? **(2+6=8)**

Answer:

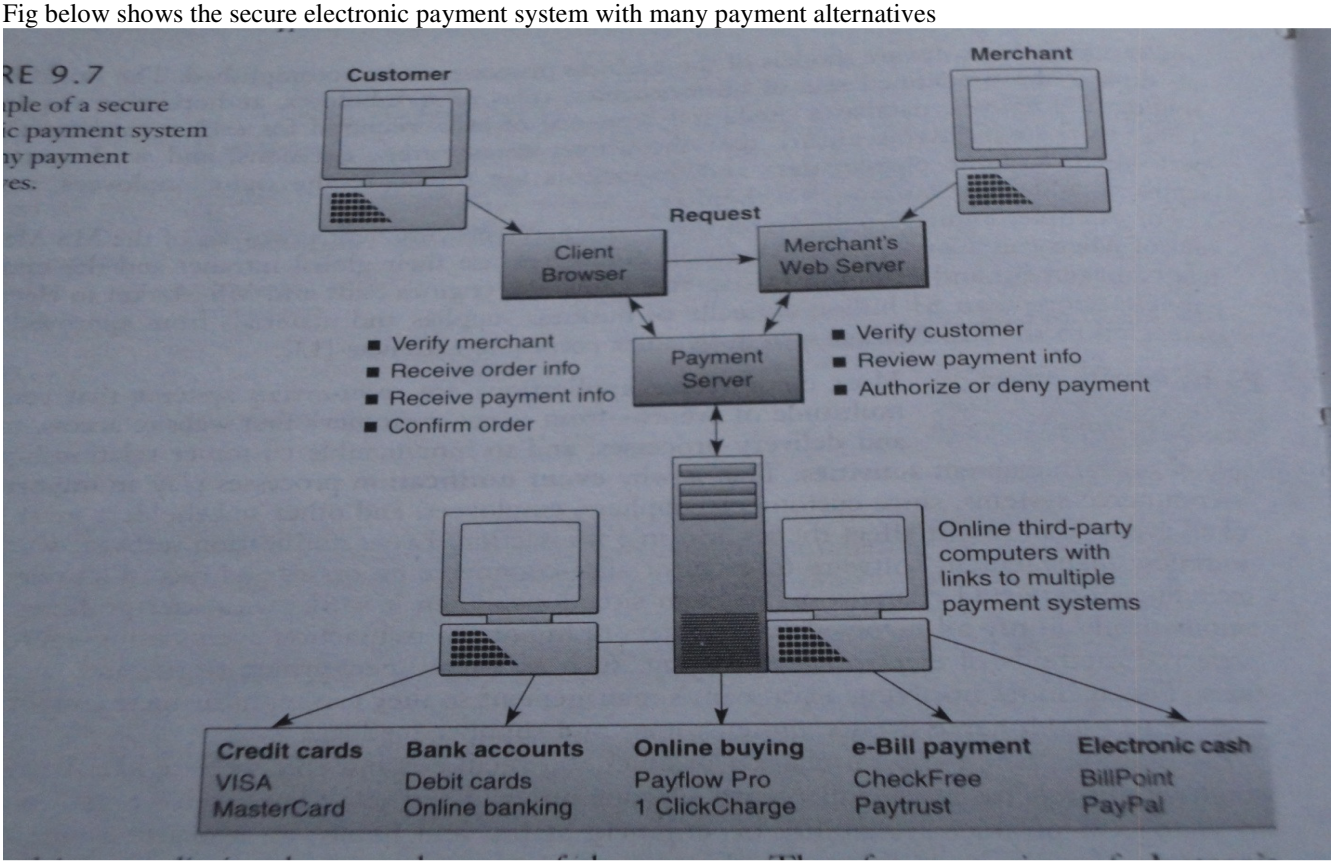
a)

Solution:

E-commerce is the use of the internet and the web to transact business. More formally, digitally enabled commercial transactions between and among organization and individuals.

E-commerce is more than just buying, selling products online. It encompasses the entire online process of developing, marketing, selling, delivering, servicing and paying for goods or services transacted on internetworked, global marketplace of customers with the support of a worldwide network of business partner.

Fig below shows the secure electronic payment system with many payment alternatives



A payment gateway server facilitates the transfer of information between a payment portal (such as a website, mobile phone or IVR service) and the Front End Processor or acquiring bank. When a customer orders a product from a payment gateway-enabled merchant, the payment gateway performs a variety of tasks to process the transaction

✓ A customer places order on website by pressing the 'Submit Order' or equivalent button, or perhaps enters their card details using an automatic phone answering service.

✓ If the order is via a website, the customer's web browser encrypts the information to be sent between the browser and the merchant's web server. This is done via SSL (Secure Socket Layer) encryption.

✓ The merchant then forwards the transaction details to their payment gateway. This is another SSL encrypted connection to the payment server hosted by the payment gateway.

✓ The payment gateway forwards the transaction information to the payment processor used by the merchant's acquiring bank.

✓ The payment processor forwards the transaction information to the card association (e.g., Visa/MasterCard)

✓ The credit card issuing bank receives the authorization request and does fraud and credit or debit checks and then sends a response back to the processor (via the same process as the request for authorization) with a response code [eg: approved, denied]. In addition to communicating the fate of the authorization request, the response code is used to define the reason why the transaction failed (such as insufficient funds, or bank link not available). Meanwhile, the credit card issuer

holds an authorization associated with that merchant and consumer for the approved amount. This can impact the consumer's ability to further spend (eg: because it reduces the line of credit available or because it puts a hold on a portion of the funds in a debit account).

✓ The processor forwards the authorization response to the payment gateway.

✓ The payment gateway receives the response, and forwards it on to the website (or whatever interface was used to process the payment) where it is interpreted as a relevant response then relayed back to the merchant and cardholder. This is known as the Authorization or "Auth"

✓ The merchant then fulfills the order and the above process is repeated but this time to "Clear" the authorization by consummating the transaction. Typically the "Clear" is initiated only after the merchant has fulfilled the transaction (eg: shipped the order). These results in the issuing bank 'clearing' the 'auth' (ie: moves auth-hold to a debit) and prepares them to settle with the merchant acquiring bank.

✓ The merchant submits all their approved authorizations, in a "batch" (eg: end of day), to their acquiring bank for settlement via its processor.

✓ The acquiring bank makes the batch settlement request of the credit card issuer.

✓ The credit card issuer makes a settlement payment to the acquiring bank (eg: the next day)

The acquiring bank subsequently deposits the total of the approved funds in to the merchant's nominated account (eg: the day after). This could be an account with the acquiring bank if the merchant does their banking with the same bank, or an account with another bank.

b) As per definition SCM is the management of a network of all business processes and activities involving procurement of raw materials, manufacturing and distribution management of Finished Goods. SCM is also called the art of management of providing the Right Product, At the Right Time, Right Place and at the Right Cost to the Customer.

Why SCM strategy is important for an Organization

Supply Chain Strategies are the critical backbone to Business Organizations today. Effective Market coverage, Availability of Products at locations which hold the key to revenue recognition depends upon the effectiveness of Supply Chain Strategy rolled out. Very simply stated, when a product is introduced in the market and advertised, the entire market in the country and all the sales counters need to have the product where the customer is able to buy and take delivery. Any glitch in product not being available at the right time can result in drop in customer interest and demand which can be disastrous. Transportation network design and management assume importance to support sales and marketing strategy.

Inventory control and inventory visibility are two very critical elements in any operations for these are the cost drivers and directly impact the bottom lines in the balance sheet. Inventory means value and is an asset of the company. Every business has a standard for inventory turnaround that is optimum for the business. Inventory turnaround refers to the number of times the inventory is sold and replaced in a period of twelve months. The health of the inventory turn relates to the health of business.

In a global scenario, the finished goods inventory is held at many locations and distribution centers, managed by third parties. A lot of inventory would also be in the pipeline in transportation, besides the inventory with distributors and retail stocking points. Since any loss of inventory anywhere in the supply chain would result in loss of value, effective control of inventory and visibility of inventory gains importance as a key factor of Supply Chain Management function.

5.

a) Explain about the vulnerability of the information system. **5**

b) Describe how Information System Auditor helps in the quality control. **5**

c) What do you mean by CAAT? How does it help in IS audit? **5**

Answer:

a) As the large volumes of data are stored in the electronic format in the computer based information system it is susceptible to various types of threats. Thus threats to the computer system are also threats to the information system. Common thresdats to the computerized information system can be summarized as:

- Failure of computer hardware during the operation.
- Failure of the working of the software during the operation.
- Malpractices of the personnel working in the information system.
- Unauthorized access to the terminals in use.
- Theft, deletion, changes of the data, services and equipment of the information system.
- Fire and destruction of the physical infrastructure.
- Electrical power supply problem and outage.
- Unintentional human errors during the process of operation of the system.
- Telecommunication and networking problems.

b) Information system Auditor involved in reviewing overall activity of the information system from the stage of development to the operation and service. An information system auditor ensures following things:

- An adequate audit trail so that transactions can be traced forward and backward through the system.

- Controls over the accounting for all data entered into the system and controls to ensure the integrity of those transactions throughout the computerized segment of the system.
- Handling exceptions to and rejections from the computer system.
- Testing to determine whether the systems perform as stated.
- Control over changes to the computer system to determine whether the proper authorization has been given.
- Authorization procedures for system overrides.
- Determining whether organization and government policies and procedures are adhered to in system implementation.
- Training user personnel in the operation of the system.
- Developing detailed evaluation criteria so that it is possible to determine whether the implemented system has met predetermined specifications.
- Adequate controls between interconnected computer systems.
- Adequate security procedures to protect the users data.
- Backup and recovery procedures for the operation of the system.
- Technology provided by different vendors is compatible and controlled.

As the IS auditors ensures above activities it helps in the quality control of the information system.

c) CAAT (computer assisted audit technique), as it is commonly used, is the practice of analyzing large volumes of data looking for anomalies. A well designed CAAT audit will not be a sample, but rather a complete review of all transactions. Using CAAT the auditor will extract every transaction the business unit performed during the period reviewed. The auditor will then test that data to determine if there are any problems in the data. The CAAT auditor can easily look for duplicate vendors or transactions. When such a duplicate is identified, they can approach management with the knowledge that they tested 100% of the transactions and that they identified 100% of the exceptions.

Another advantage of CAAT is that it allows auditors to test for specific risks. For example, an insurance company may want to ensure that it doesn't pay any claims after a policy is terminated. Using traditional audit techniques this risk would be very difficult to test. The auditor would "randomly select" a "statistically valid" sample of claims (usually 30-50.) They would then check to see if any of those claims were processed after a policy was terminated. Since the insurance company might process millions of claims the odds that any of those 30-50 "randomly selected" claims occurred after the policy was terminated is extremely unlikely. Even if one or two of those claims was for a date of service after the policy termination date, what does that tell the auditor?

Using CAAT the auditor can select every claim that had a date of service after the policy termination date. The auditor then can determine if any claims were inappropriately paid. If they were, the auditor can then figure out why the controls to prevent this failed. In a real life audit, the CAAT auditor noted that a number of claims had been paid after policies were terminated. Here is list of use of CAAT in brief:

- Recalculating and Verifying balances
- Testing compliance with standard
- Aging Analysis of receivables and payables
- Identifying control issue
- Testing Duplicates within data
- Testing gaps in invoice numbers

5. Write short notes on the following: **(5×3=15)**

a) Decision Support System
b) Object Oriented Design
c) Software Reliability
d) Computer Crime
e) Computer Based MIS

Answer:

i) ***Decision support systems*** are computer-based information systems that provide interactive information support to managers and business professionals during the decision-making process. Decision support systems use:

- Analytical models
- Specialized databases
- Decision maker's own insights and judgments
- Interactive, computer-based modeling process to support the making of semi-structured and unstructured business decisions

Decision support systems rely on ***model bases*** as well as databases as vital system resources. A DSS model base is a software component that consists of models used in computational and analytical routines that mathematically express relationships among variables. Examples include:

- Spreadsheet models
- Linear programming models

- Multiple regression forecasting models
- Capital budgeting present value models

Typically, a manager uses a DSS software package at his workstation to make inquiries, responses and to issue commands. This differs from the demand responses of information reporting systems, since managers are not demanding pre-specified information. Rather, they are exploring possible alternatives. They do not have to specify their information needs in advance. Instead they use the DSS to find the information they need to help them make a decision.

Using a DSS involves four basic types of analytical modelling activities:

- ***What-If Analysis:*** - In what-if analysis, an end user makes changes to variables, or relationships among variables, and observes the resulting changes in the values of other variables.
- ***Sensitivity Analysis:*** - Is a special case of what-if analysis. Typically, the value of only one variable is changed repeatedly, and the resulting changes on other variables are observed. So sensitivity analysis is really a case of what-if analysis involving repeated changes to only one variable at a time. Typically, sensitivity analysis is used when decision-makers are uncertain about the assumptions made in estimating the value of certain key variables.
- ***Goal-Seeking Analysis: -*** Reverses the direction of the analysis done in what-if and sensitivity analysis. Instead of observing how changes in a variable affect other variables, goal-seeking analysis sets a target value for a variable and then repeatedly changes other variables until the target value is achieved.
- ***Optimization Analysis: -*** Is a more complex extension of goal-seeking analysis. Instead of setting a specific target value for a variable, the goal is to find the optimum value for one or more target variables, given certain constraints. Then one or more other variables are changed repeatedly, subject to the specified constraints, until the best values for the target variables are discovered.

ii) **Object Oriented Design**

An object contains encapsulated data and procedures grouped together to represent an entity. The 'object interface', how the object can be interacted with, is also defined. An object-oriented program is described by the interaction of these objects. Object-oriented design is the discipline of defining the objects and their interactions to solve a problem that was identified and documented during object-oriented analysis.

During object-oriented design (OOD), a developer applies implementation constraints to the conceptual model produced in object-oriented analysis. Such constraints could include not only constraints imposed by the chosen architecture but also any non-functional – technological or environmental – constraints, such as transaction throughput, response time, run-time platform, development environment, or those inherent in the programming language. Concepts in the analysis model are mapped onto implementation classes and interfaces resulting in a model of the solution domain, i.e., a detailed description of *how* the system is to be built.

iii) **Software Reliability**

First definition: Software reliability is defined as the probability of failure-free operation of a software system for a specified time in a specified environment.

Key elements of the above definition

- Probability of failure-free operation
- Length of time of failure-free operation
- A given execution environment

Example

The probability that a PC in a store is up and running for eight hours without crash is 0.99.

Second definition: Failure intensity is a measure of the reliability of a software system operating in a given environment.

Example: An air traffic control system fails once in two years.

The first puts emphasis on MTTF, whereas the second on count.

A user's perception of the reliability of software depends upon two categories of information.

The number of faults present in the software.

The ways users operate the system.

This is known as the *operational profile*.

The fault count in a system is influenced by the following.

Size and complexity of code

Characteristics of the development process used

Education, experience, and training of development personnel

Operational environment

iv) **Computer Crime**

Computer crime is a growing threat to society by the criminal or irresponsible actions of computer individuals who are taking advantage of the widespread use of vulnerability of computers and the Internet and other networks. It thus presents a major challenge to the ethical use of information technologies. e-computer crime poses serious threats to the integrity, safety, and survival of most e-business systems, and thus makes the development of effective security methods a top priority.

Computer crime is defined by The Association of Information Technology professionals (ATIP) as including:

- The unauthorized use, access, modification, and destruction of hardware, software, data, or network resources.

- The unauthorized release of information
- The unauthorized copying of software
- Denying an end user access to his or her own hardware, software, data, or network resources
- Using or conspiring to use computer or network resources to illegally obtain information or tangible property.

v) **Computer based MIS**

Computer Based Management Information Systems (MIS) is the computer-based organizational system that offers and consolidates information for management-related activities, functions and decisions. It is a complex system composed of computer hardware and software that work together. MIS enables collection, transmission, processing and storing information. It organizes huge volumes of seemingly unmanageable data and turns them into reports. Decision makers can study such reports and distinguish trends and patterns that are made highly noticeable by the system.

Good computer-based management information should be accurate, current and not require too much time to retrieve. Information must be relevant so it can improve decision-making. It also must reaffirm and evaluate decisions made in the past. For example, information on how many people buy a certain toy brand in the market can help the manufacturers decide whether to increase production. Managed information is accurate when it reflects actual events and facts. In some cases, information needs to be exact, especially in dealing with numbers such as a store's revenue for a certain month.