2
Information Systems Concepts

Question 1

Describe briefly three levels of Management. *(3 Marks, November 2003)*

Answer

Three levels of management are briefly discussed below:

- Strategic level: Strategic level is defined as a set of management positions that is concerned with developing of organizational missions, objectives and strategies, directing and managing the organization in an integrated manner. Decisions made at this level of organization to handle problems critical to the survival and success of the organization is called strategic decisions. Strategic level also establishes a budget framework under which the various departments will operate.
- Tactical decisions: This level lies in the middle of managerial hierarchy. At this level, managers plan, organize, lead and control the activities of other managers. Decisions made at this level, called the tactical decisions, are made to implement strategic decisions. Tactical decisions are relatively short, step-like spot solutions to breakdown strategic decisions into implementable packages.
- Supervisory level: This is the lowest level in managerial hierarchy. The managers at this level coordinate the work of others who are not themselves managers. At supervisory level, managers are responsible for routine, day-to-day decisions and activities of the organization, which do not require much judgment and discretion. They ensure that specific tasks are carried out effectively and efficiently.

Question 2

Discuss the potential impact of computers and MIS at the top level of Management.

(3 Marks, November 2003)

Answer

The potential impact of computers on top-level management May be quite significant. An important factor, which May account for this change, is the fast development in the area of computer science. It is believed that in future computers would be able to provide simulation models to assist top management in planning their activities. By using sensitivity analysis with

the support of computers, it May be possible to study and measure the effect of variation of individual factors to determine final results. Also, the availability of a new class of experts will facilitate effective communication with computers. Such experts May also play a useful role in the development and processing of models. In brief, potential impact of computers would be more in the area of planning and decision-making.

Futurists believe that in future, top management will realize the significance of techniques like simulation, sensitivity analysis and management science. The application of these techniques to business problems with the help of computers would generate accurate, reliable, timely and comprehensive information to top management. Such information will be quite useful for the purpose of managerial planning and decision-making. Computerized MIS will also influence in the development, evaluation and implementation of a solution to a problem under decision-making process.

Question 3

Write short notes on the following:

(a) Executive Information Systems *(5 Marks, November 2003)*

(b) Expert systems. *(5 Marks, May 2004)*

(c) Closed and open systems *(5 Marks, May 2004)*

(d) Benefits of Expert Systems *(4 Marks, November 2010)*

(e) *Business applications of Expert systems for Management Support systems* *(4 Marks, May 2011)*

Answer

(a) Executive Information System (EIS): It is a tool that is designed to meet the special needs of top-level managers. It provides direct on-line access to relevant information in a useful and navigable format. Relevant information is timely, accurate, and actionable about aspects of a business that are of particular interest to the senior manager. The useful and navigable format of the system means that it is specifically designed to be used by individuals with limited time, limited keyboarding skills, and little direct experience with computers. An EIS is easy to navigate so that managers can identify broad strategic issues, and then explore the information to find the root causes of those issues.

EIS require large amounts of capacity and processing power within both the system and the network. Although most computer systems May contain some of the above characteristics, they can be differentiated from EIS in a number of ways. Most MIS and operational systems are based on transaction processing carried out by a variety of on-line and batched inputs. Unlike the EIS, information is usually presented in numerical or textual form and reporting is by exception, usually in printed report format. Also, EISs tend to be externally-focused, strategically-based systems using both internal and

external data, whereas other computer systems mainly concentrate on internal control aspects of the organization.

An EIS serves many purposes. The primary purpose of an Executive Information System is to support managerial learning about an organization, its work processes, and its interaction with the external environment. Informed managers can ask better questions and make better decisions.

Secondly, EIS allows timely access to information. Timely access also influences learning. When a manager obtains the answer to a question, that answer typically sparks other related questions in the manager's mind. If those questions can be posed immediately, and the next answer retrieved, the learning cycle continues unbroken. Using traditional methods, by the time the answer is produced, the context of the question May be lost, and the learning cycle will not continue.

Finally, an EIS has a powerful ability to direct management attention to specific areas of the organization or specific business problems. Some managers see this as an opportunity to discipline subordinates.

(b) Expert systems are designed to replace the need for a human expert. They are particularly important where expertise is scarce and therefore expensive. This is not 'number-crunching' software, but software that expresses knowledge in terms of facts and rules. This knowledge will be in a specific area, and therefore expert systems are not general, as are most decision support systems, which can be applied to most scenarios, an expert system for oil drilling is not of much use in solving company taxation problems.

While there May have been a progression from transaction-processing systems, through management information systems, to decision-support and executive information systems, expert systems have arisen largely from academic research into artificial intelligence. The expert system should be able to learn, i.e. change or add new rules. They are developed using very different programming languages such as PROLOG, which are referred to as fifth generation languages, or expert systems shells, which can make the process quicker and easier. It has been suggested that expert systems would be of greater use in the tactical and strategic level. This has been the case in banking, where expert systems scrutinize applications for loans, and lower level staff accepts the system's decision. This has replaced the somewhat subjective decision-making of more senior managers.

(c) Closed Systems: A closed system is self-contained and does not interact or make exchange across its boundaries with its environment. Closed systems do not get the feedback they need from the external environment and tend to deteriorate eventually. For example, if a marketing system does not get feedback from the market, its efficiency will gradually continue to decrease.

A relatively closed system is one that has only controlled and well defined inputs and outputs. It is not subject to disturbances from its environment. A computer program can

be taken as an example of relatively closed system because it accepts only previously defined inputs, processes them and provides previously defined outputs.

Open Systems: Open systems actively interact with their environment. Such systems regularly get inputs and give outputs to its environment. These systems are also subject to unknown inputs and environmental disturbances. Open systems are also able to adapt to environmental changes for their survival and growth. Business organization is an example of such system.

(d) Benefits of Expert Systems: Major benefits of expert systems are given as follows:

- Expert Systems preserve knowledge that might be lost through retirement, resignation or death of an acknowledged company expert.
- Expert Systems put information into an active-form so that it can be summoned almost as a real-life expert might be summoned.
- Expert Systems assist novices in thinking the way experienced professionals do.
- Expert Systems are not subjected to such human fallings as fatigue, being too busy, or being emotional.
- Expert Systems can be effectively used as a strategic tool in the areas of marketing products, cutting costs and improving products.

(e) Business applications of Expert Systems for Management Support Systems are given as follows:

(i) Accounting and Finance: It provides tax advice and assistance, helping with credit authorization decisions, selecting forecasting models, providing investment advice.

(ii) Marketing: It provides establishing sales quotas, responding to customer inquiries, referring problems to telemarketing centers, assisting with marketing timing decisions, determining discount policies.

(iii) Manufacturing: It helps in determining whether a process is running correctly, analyzing quality and providing corrective measures, maintaining facilities, scheduling job-shop tasks, selecting transportation routes, assisting with product design and faculty layouts.

(iv) Personnel: It is useful in assessing applicant qualifications, giving employees assisting at filling out forms.

(v) General Business: It helps in assisting with project proposals, recommending acquisition strategies, educating trainees, evaluating performance.

Question 4

"A decision support system supports the human decision-making process rather than providing a means to replace it". Justify the above statement by stating the characteristics of decision support system. *(5 Marks, May 2005)*

Or

What is Decision Support System? Briefly explain three characteristics of Decision Support System. *(5 Marks, November 2008)*

Or

What is Decision Support System? Discuss its characteristics in brief. *(6 Marks, May 2012)*

Answer

A decision support system (DSS) is defined as a system that provides tools to managers to assist them in solving semi-structured and unstructured problems in their own way. A DSS is not intended to make decisions for managers, but rather to provide managers with a set of capabilities that enables them to generate the information required by them in making decisions. The DSS are characterized by following three properties:

(i) Semi-structured / Unstructured decisions – Structured decisions are those that are easily made from a given set of inputs. Unstructured decisions and semi-structured decisions are decisions for which information obtained from a computer system is only a portion of the total knowledge needed to make the decision. The DSS is particularly well adapted to help with semi-structured / unstructured decisions. In DSS, the problem is first defined and formulated. It is then modeled with DSS software. The model is run on the computer to provide results. The modeler, in reviewing these results, might decide to completely reformulate the problem, refine the model, or use the model to obtain other results.

(ii) Ability to adapt to changing need – Semi-structured / unstructured decisions often do not conform to a predefined set of decisions-making rules. Because of this, their decision support system must provide for enough flexibility to enable users to model their own information needs. The DSS designer understands that managers usually do not know in advance what information they need and, even if they do, those information needs keep changing constantly. Thus, rather than locking the system into rigid information producing requirements, capabilities and tools are provided by DSS to enable users to meet their own output needs.

(iii) Ease of Learning and Use - Since decision support systems are often built and operated by users rather than by computer professionals, the tools that company possesses should be relatively easy to learn and use. Such software tools employ user-oriented interfaces such as grid, graphics, non-procedural 4GL and easily read documentation. These interfaces make it easier for user to conceptualize and perform the decision making process.

Question 5

Describe the main pre-requisites of a Management Information System, which makes it an effective tool. *(5 Marks, May 2005)*

Answer

Pre-requisites of an MIS – The following are pre-requisites of an effective MIS:

(i) Database – It is a super file which consolidates data records formerly stored in many data files. The data in database is organized in such a way that access to the data is improved and redundancy is reduced. Normally, the database is subdivided into major information sub-sets needed to run. The database should be user-oriented, capable of being used as a common data source, available to authorized persons only and should be controlled by a separate authority such as DBMS. Such a database is capable of meeting information requirements of its executives, which is necessary for planning, organizing and controlling the operations of the business.

(ii) Qualified System and Management Staff - MIS should be manned by qualified officers. These officers who are experts in the field should understand clearly the views of their fellow officers. The organizational management base should comprise of two categories of officers (i) System and Computer experts and (ii) Management experts. Management experts should clearly understand the concepts and operations of a computer. Their whole hearted support and cooperation will help in making MIS an effective one.

(iii) Support of Top Management - An MIS becomes effective only if it receives the full support of top management. To gain the support of top management, the officer should place before them all the supporting facts and state clearly the benefits which will accrue from it to the concern. This step will certainly enlighten the management and will change their attitude towards MIS.

(iv) Control and Maintenance of MIS – Control of the MIS means the operation of the system as it was designed to operate. Sometimes users develop their own procedures or shortcut methods to use the system, which reduces its effectiveness. To check such habits of users, the management at each level in the organization should device checks for the information system control.

Maintenance is closely related to control. There are times when the need for improvements to the system will be discovered. Formal methods for changing and documenting changes must be provided.

(v) Evaluation of MIS – An effective MIS should be capable of meeting the information requirements of its executives in future as well. The capability can be maintained by evaluating the MIS and taking appropriate timely action. The evaluation of MIS should take into account the following points:

- Examining the flexibility to cope with future requirements ;
- Ascertaining the view of the users and designers about the capabilities and deficiencies of the system ;
- Guiding the appropriate authority about the steps to be taken to maintain effectiveness of MIS.

Question 6

What is an Executive Information system ? Discuss its various purposes.

(10 Marks, November 2005)

Or

Explain Executive Information System (EIS). What purpose does it serve?

(5 Marks, November 2008)

Answer

An Executive Information System (EIS) is a tool that provides direct online access to relevant information in a useful and navigable format. Relevant information is timely, accurate, and actionable information about aspects of a business that are of particular interest to the senior manager. The useful and navigable format of the system means that it is specifically designed to be used by individuals with limited time, limited key boarding skills and little direct experience with computers. An EIS is quite easy to navigate so that mangers can identify broad strategic issues and then explore the information to find the root causes of those issues.

Executive Information Systems can be used for wide range of applications. In government, EIS have been constructed to track data about ministerial correspondence, case management, workers' productivity, finances and human resources etc. EIS have also been used to monitor information about competitors in the news media and data bases of public information etc.

EIS require large amounts of capacity and processing power within both the system and the network since information is in summary format by pictorial or graphical means. However, EIS has the facility to "drill down" to other levels of information to see the details. The ability to manipulate data, to project "what if" outcomes and to work with modeling tools. Within the system are also evident in EIS.

Purposes of EIS:

(i) The primary purpose of an EIS is to support managerial learning about an organization, its work processes and its interaction with the external environment. Informed managers can ask better questions and make better decisions.

(ii) Second purpose for an EIS is to allow timely access to information. All of the information contained in an EIS can typically be obtained by a manager through traditional methods. However, the resources and time required to manually compile information in a wide variety of formats and in response to ever changing requirements often inhibit managers from obtaining this information. Often, by the time a useful report can be compiled, the strategic issues facing the manager change, and the report cannot be used. Timely access also influences learning. When a manger obtains the answer to a question, that answer typically sparks other related questions in the manger's mind. This way learning cycle continues unbroken.

(iii) Third purpose of an EIS is commonly misperceived. An EIS has a powerful ability to direct management attention to specific areas of the organization or specific business problems. Some managers look upon this as an opportunity to discipline subordinates.

(iv) Sometimes misaligned reporting systems can result in inordinate management attention to things that are not so important. An EIS system can provide information that is actually important and represents a balanced view of the organization's objectives.

Question 7

Discuss the limitations of the Management Information system. *(5 Marks, May 2006)*

Or

What are major limitations of MIS? Explain in brief. *(4 Marks, November 2012)*

Answer

Major Limitations of MIS are given as follows:

- The quality of the outputs of MIS is basically governed by the quality of input and processes.
- MIS is not a substitute for effective management, which means that it cannot replace managerial judgment in making decisions in different functional areas. It is merely an important tool in the hands of executives for decision making and problem solving.
- MIS May not have requisite flexibility to quickly update itself with the changing needs of time, especially in fast changing and complex environment.
- MIS cannot provide tailor-made information packages suitable for every type of decision made by executives.
- MIS takes into account mainly quantitative factors, thus it ignores the non-quantitative factors like morale and attitude of members of organization, which have an important bearing on the decision making process of executives or senior management.
- MIS is less useful for making non-programmed decisions. Such decisions are not routine and thus require information, which May not be available from existing MIS.
- The effectiveness of MIS is reduced in enterprises, where the culture of hoarding information and not sharing with other is prevalent.
- MIS effectiveness decreases due to frequent changes in top management, organizational structure and operational team.

Question 8

What do you mean by Information? Describe the important characteristics of information, which makes it useful to the organization. *(10 Marks, May 2006)*

Or

Define the term "Information". Discuss various important attributes that are required for useful and effective information. *(8 Marks, November 2011)*

Answer

Information: Technically, information means processed data that have been put into a meaningful and useful context. Data consists of facts, values or results, and information is the result of relation between data e.g. in a spread sheet student name, roll number and marks obtained in science and arts subjects represents data whereas the graph that shows the percentage of students, who acquired more than 80% in science subjects and 65% in arts subjects represents information. Information May be represented in the form of text, graph, pictures, voice, videos etc.

Mere collection of data is not information and mere collection of information is not knowledge. Information relates to description, definition, or perspective (what, who, when, where). Information is essential because it adds knowledge, helps in decision making, analyzing the future and taking action in time. Information products produced by an information system can be represented by number of ways e.g. paper reports, visual displays, multimedia documents, electronic messages, graphics images, and audio responses.

Attributes of Information: Some of the important attributes of useful and effective information are given as follows:

- Availability – It is a very important aspect of information. Information is useless if it is not available at the time of need.
- Purpose/Objective – Information must have purposes/objective at the time it is transmitted to a person or machine, otherwise it is simple data. Depending upon the activities in an organization the Information communicated to people has a purpose. The basic objective of information is to inform, evaluate, persuade, and organize. This indeed helps in decision making, generating new concepts and ideas, identify and solve problems, planning, and controlling which are needed to direct human activity in business enterprises.
- Mode and format – The modes of communicating information to humans should be in such a way that it can be easily understand by the people. The mode May be in the form of voice, text or a combination of these two. Format also plays an important role in communicating the idea. It should be designed in such a way that it assists in decision making, solving problems, initiating planning, controlling and searching. According to the type of information, different formats can be used e.g. diagrams, graphs, curves are best suited for representing statistical data. Format of information should be simple, relevant and should highlight important points but should not be too cluttered up.
- Current/Updated – The information should be refreshed from time to time as it usually rots with time and usage. For example, the running score sheet of a cricket match available in Internet sites should be refreshed at fixed intervals of time so that the current

score will be available. Similar is the case with broker who wants the latest information about the stock market.

- Rate – The rate of transmission/reception of information May be represented by the time required to understand a particular situation. Useful information is the one which is transmitted at a rate which matches with the rate at which the recipient wants to receive. For example- information available from internet site should be available at a click of mouse, and one should not have to wait for it for an hour.
- Frequency – The frequency with which information is transmitted or received affects its value. For example- weekly reports of sales show little change as compared to the quarterly reports and contribute less for assessing salesman capability.
- Completeness and Adequacy – The information provided should be complete and adequate in itself because only complete information can be used in policy making. For example-the position of student in a class can be found out only after having the information of the marks of all students and the total number of students in a class.
- Reliability – It is a measure of failure or success of using information for decision-making. If information leads to correct decision on many occasions, we say the information is reliable.
- Validity – It measures how close the information is to the purpose for which it asserts to serve. For example, the experience of employee does not support evaluating his performance.
- Quality – It means the correctness of information. For example, the correct status of inventory is highly required.
- Transparency – It is essential in decision and policy making. For example, giving only total amount of advances does not give true picture of utilization of funds for decision about future course of action; rather deposit-advance ratio May be more transparent information as it gives information relevant for decision making.
- Value of information – It is defined as difference between the value of the change in decision behavior caused by the information and the cost of the information. In other words, given a set of possible decisions, a decision-maker May select one on basis of the information at hand. If new information causes a different decision to be made, the value of the new information is the difference in value between the outcome of the old decision and that of the new decision, less the cost of obtaining the information.

Question 9

State the factors to be considered for designing an effective Management Information System.

(10 Marks, November 2006)

OR

What do you understand by MIS? Discuss major characteristics of an effective MIS.

OR

Describe any six characteristics of an effective management information system.

(6 Marks, November 2013)

Answer

Management Information Systems (MIS): MIS has been defined by Davis and Olson as "An integrated user-machine system designed for providing information to support operational control, management control and decision making functions in an organization". Another notable definition of MIS is "*MIS is a computer based system that provides flexible and speedy access to accurate data".*

MIS support managers at different levels to take strategic (at top level) or tactical (at middle level) management decisions to fulfill organizational goals. Nature of MIS at different levels has different flavors and they are available in the form of reports, tables, graphs and charts or in presentation format using some tools. MIS at the top level is much more comprehensive but is condensed or summarized compared to the information provided to those at middle level management. MIS can help in making effective, structured reports relevant for decisions of day-to-day operations. These reports and displays can be made available on demand, periodically or whenever exceptional conditions occur.

Characteristics of an effective MIS: Major characteristics of an effective MIS are given as follows:

- Management Oriented: It means that efforts for the development of the Information System should start from an appraisal of management needs and overall business objectives. Such a system is not necessarily for top management only but May also meet the information requirements of middle level or operating levels of management.
- Management Directed: Because of management orientation of MIS, it is necessary that management should actively direct the system's development efforts. For system's effectiveness, it is necessary for management to devote sufficient amount of their time not only at the stage of designing the system but for its review as well to ensure that the implemented system meets the specifications of the designed system.
- Integrated: The best approach for developing information systems is the integrated approach as all the functional and operational information sub-systems are to be tied together into one entity. An integrated Information system has the capability of generating more meaningful information to management as it takes a comprehensive view or a complete look at the interlocking sub-systems that operate within a company.
- Common Data Flows: It means the use of common input, processing and output procedures and media whenever required. Data is captured by the system analysts only once and as close to its original source as possible. Afterwards, they try to utilize a minimum of data processing procedures and sub-systems to process the data and strive to minimize the number of output documents and reports produced by the system. This

eliminates duplication in data collections, simplifies operations and produces an efficient information system.

- Heavy Planning Element: An MIS usually takes one to three years and sometimes even longer to get established firmly within a company. Therefore, a MIS designer must be present while development of MIS and should consider future enterprise objectives and requirements of information as per its organization structure.
- Sub System Concept: Even though the information system is viewed as a single entity, it must be broken down into digestible sub-systems, which can be implemented one at a time in a phased plan. The breaking down of MIS into meaningful sub-systems sets the stage for this phasing plan.
- Common Database: Database is the mortar that holds the functional systems together. It is defined as a "super-file", which consolidates and integrates data records formerly stored in many separate data files. The organization of a database allows it to be accessed by several information sub-systems and thus, eliminates the necessity of duplication in data storage, updating, deletion and protection.
- Computerized: Though MIS can be implemented without using a computer; the use of computers increases the effectiveness of the system. In fact, its use equips the system to handle a wide variety of applications by providing their information requirements quickly. Other necessary attributes of the computer to MIS are accuracy and consistency in processing data and reduction in clerical staff. These attributes make computer a prime requirement in MIS.

Question 10

"Decision support systems are widely used as part of an Organization's Accounting Information system". Give examples to support this statement. ***(10 Marks, May 2007)***

OR

Discuss various examples of DSS in Accounting.

Answer

DSSs are widely used as a part of an organization's Accounting Information System. The complexity and nature of decision support systems vary. Many are developed in-house using either a general type of decision support program or a spreadsheet program to solve specific problems. Below are several illustrations:

- Cost Accounting System: The health care industry is well known for its cost complexity. Managing costs in this industry requires controlling costs of supplies, expensive machinery, technology, and a variety of personnel. Cost accounting applications help health care organizations calculate product costs for individual procedures or services. Decision support systems can accumulate these product costs to calculate total costs per patient. Health care managers many combine cost accounting decision support systems

with other applications, such as productivity systems. Combining these applications allows managers to measure the effectiveness of specific operating processes. One health care organization, for example, combines a variety of decision support system applications in productivity, cost accounting, case mix, and nursing staff scheduling to improve its management decision making.

- Capital Budgeting System: Companies require new tools to evaluate high-technology investment decisions. Decision makers need to supplement analytical techniques, such as net present value and internal rate of return, with decision support tools that consider some benefits of new technology not captured in strict financial analysis. One decision support system designed to support decisions about investments in automated manufacturing technology is Auto Man, which allows decision makers to consider financial, nonfinancial, quantitative, and qualitative factors in their decision-making processes. Using this decision support system, accountants, managers, and engineers identify and prioritize these factors. They can then evaluate up to seven investment alternatives at once.
- Budget Variance Analysis System: Financial institutions rely heavily on their budgeting systems for controlling costs and evaluating managerial performance. One institution uses a computerized decision support system to generate monthly variance reports for division comptrollers. The system allows these comptrollers to graph, view, analyze, and annotate budget variances, as well as create additional one-and five-year budget projections using the forecasting tools provided in the system. The decision support system thus helps the comptrollers create and control budgets for the cost-center managers reporting to them.
- General Decision Support System: As mentioned earlier, some planning languages used in decision support systems are general purpose and therefore have the ability to analyze many different types of problems. In a sense, these types of decision support systems are a decision-maker's tools. The user needs to input data and answer questions about a specific problem domain to make use of this type of decision support system. An example is a program called *Expert Choice*. This program supports a variety of problems requiring decisions. The user works interactively with the computer to develop a hierarchical model of the decision problem. The decision support system then asks the user to compare decision variables with each other. For instance, the system might ask the user how important cash inflows are versus initial investment amount to a capital budgeting decision. The decision maker also makes judgments about which investment is best with respect to these cash flows and which requires the smallest initial investment. Expert Choice analyzes these judgments and presents the decision maker with the best alternative.

Question 11

Differentiate between open and closed systems. *(5 Marks, May 2007)*

Answer

A Closed System is self-contained and does not interact or make exchange across its boundaries with its environment. Closed systems do not get the feedback they need from the external environment and tend to deteriorate. A Closed Systems one that has only controlled and well defined input and output. Participant in a closed system become closed to external feedback without fully being aware of it. Some of the examples of closed systems are manufacturing systems, computer programs etc.

Open System actively interact with other systems and establish exchange relationship. They exchange information, material or energy with the environment including random and undefined inputs. Open systems tend to have form and structure to allow them to adapt to changes in their external environment for survival and growth. Organizations are considered to be relatively open systems.

Question 12

System analysts develop various categories of information systems to meet a variety of business needs. Discuss any three such systems briefly. *(10 Marks, November 2007)*

Answer

Systems analysts develop the following types of information systems to meet a variety of business needs:

(i) Transaction processing systems

(ii) Management information systems

(iii) Decision support systems

(iv) Executive information systems

(v) Expert systems.

Three of the above categories are discussed largely below:

(i) Transaction Processing Systems: These systems are aimed at expediting and improving the routine business activities that all organizations engage. Standard operating procedures, which facilitate handling of transactions, are often embedded in computer programs that control the entry of data, processing of details, search and presentation of data and information. Transaction processing systems if properly computerized provide speed and accuracy and can be programmed to follow routines without any variance.

(ii) Management Information Systems (MIS): Transaction processing systems are operations oriented. In contrast, MIS assist managers in decision making and problem solving. They use results produced by the transaction processing systems, but they May also use other information. In any organization, decisions must be made on many issues that recur regularly and require a certain amount of information. Because the decision making process is well understood, the manager can identify the information that will be

needed for the purpose. In turn, the information systems can be developed so that reports are prepared regularly to support these recurring decisions.

(iii) Decision Support Systems: Not all decisions are of a recurring nature. Some occur only once or recur infrequently. Decision support systems (DSS) are aimed at assisting managers who are faced with unique (non-recurring) decision problems. In well-structured situations, it is possible to identify information needs in advance, but in an unstructured environment, it becomes difficult to do so. As information is acquired, the manager May realize that additional information is required. In such cases, it is impossible to pre-design system report formats and contents. A DSS must, therefore, have greater flexibility than other information systems. Finally, we can say that DSS is of much more use when businesses are of an unstructured or semi-structured in nature. A decision support system is an integrated piece of software incorporating data base, model base and user interface. While the decision-support system can be of use at the tactical level, it is the strategic level that could make best use of it.

Question 13

Briefly explain the principles to guide the design of measures and indicators to be included in EIS. *(5 Marks, November 2007)*

OR

'There is a practical set of principles to guide the design of measures and indicators to be included in an EIS'. Explain those principles in brief.

Answer

The principles to guide the design of measures and indicators to be included in an EIS are given as follows:

- EIS measures must be easy to understand and collect. Wherever possible, data should be collected naturally as part of the process of work. An EIS should not add substantially to the workload of managers or staff.
- EIS measures must be based on a balanced view of the organization's objective. Data in the system should reflect the objectives of the organization in the areas of productivity, resource management, quality and customer service.
- Performance indicators in an EIS must reflect everyone's contribution in a fair and consistent manner. Indicators should be as independent as possible from variables outside the control of managers.
- EIS measures must encourage management and staff to share ownership of the organization's objectives. Performance indicators must promote both team-work and friendly competition. Measures will be meaningful for all staff, people feel that they, as individuals, can contribute to improving the performance of the organization.

- EIS information must be available in the organization. The objective is to provide everyone with useful information about the organization's performance. Information that must remain confidential be part of EIS.
- EIS measures must evolve to meet the changing needs of the organization.

Question 14

Describe the main prerequisites of a MIS which makes it an effective tool. Explain the major constraints in operating it. *(10 Marks, May 2008)*

Answer

The main pre-requisites of an effective MIS are as follows:

(i) Database: It can be defined as a "superfile" which consolidates data records formerly stored in many data files. The data in a database is organized in such a way that access to the data is improved and redundancy is reduced. The characteristics of database are:

- ♦ The database is sub-divided into major information subsets needed to run a business wherein each subsystem utilizes same data and information kept in same file to satisfy its information needs.
- ♦ It is user-oriented.
- ♦ It is capable of being used as a common data source, to various users, helps in avoiding duplication of efforts in storage and retrieval of data and information.
- ♦ It is available to authorized persons only.
- ♦ It is controlled by a separate authority established for the purpose, known as Data Base Management System (DBMS).
- ♦ The maintenance of data in database requires computer hardware, software and experienced computer professionals.

(ii) Qualified system and management staff: The second pre-requisite is that it should be manned by qualified officers. For this, the organisational management base should comprise of two categories of officers.

- ♦ Systems and Computer experts: They, in addition to their expertise in their subject area should be capable of understanding management concepts to facilitate the understanding of problems faced by the concern. They should also be clear about the process of decision making and information requirements for planning and control functions.
- ♦ Management experts: They should understand quite clearly the concepts and operations of a computer.

(iii) Support of Top Management: The management information system to be effective, should receive the full support of the top management. The reasons for this are as follows:

- Subordinate managers are usually lethargic about activities which do not receive the support of their superiors.
- The resources involved in computer-based information systems are large and are growing larger in view of importance gained by management information system.

Their whole hearted support and cooperation will help in making MIS an effective one.

(iv) Control and Maintenance of MIS: Control of the MIS means the operation of the system as it was designed to operate. Sometimes users develop their own procedures or short cut methods to use the system, which reduce its effectiveness. To check such habits of users, the management at each level in the organization should device checks for the information system control. At times, there May be the need for improvements to the system. Formal method and documenting always must be provided. Maintenance is closely related to control.

(v) Evaluation of MIS: The evaluation of MIS should take into account the following points:

- Examining whether enough flexibility exists in the system, to cope with any expected or unexpected information requirement in future.
- Ascertaining the views of users and the designers about the capabilities and deficiencies of the system.
- Guiding the appropriate authority about the steps to be taken to maintain effectiveness of MIS.

Constraints in operating MIS

Major constraints which come in the way of operating an information system are:

(1) Non-availability of experts, who can diagnose the objectives of the organization and provide a desired direction for installing an operating system.

(2) Experts usually face the problem of selecting the sub-system of MIS to be installed and operated upon.

(3) Due to varied objectives of business concerns, the approach adopted by experts for designing and implementing MIS is a non-standardized one.

(4) Non-availability of cooperation from staff in fact is a crucial problem. It should be handled tactfully. Educating the staff by organizing lectures, showing films, training on system and utility of the system May solve this problem.

(5) There is high turnover of experts in MIS. Turnover in fact arises due to several factors like pay packet, promotion chances, future prospects, behaviour of top ranking managers etc.

(6) Difficulty in quantifying the benefits of MIS, so that it is easily comparable with cost.

Question 15

Briefly discuss four basic components of Decision Support System. *(5 Marks, May 2008)*

Answer

A decision support system has the following components:

(i) The User: The user of a decision support system is usually a manager with an unstructured or semi-structured problem to solve. Users do not need a computer background to use a decision support system for problem solving. The most important knowledge is a thorough understanding of the problem and the factors to be considered in finding a solution. A user does not need extensive education in computer programming in part because a special planning language performs the communication function within the decision support system.

(ii) One or more databases: Decision support systems include one or more databases which contain both routine and non-routine data from both internal and external sources. The data from external sources include data about the operating environment surrounding an organization. Decision support system users May construct additional database themselves. Some of the data May come from internal source.

(iii) A planning language: Two types of planning languages that are commonly used in decision support system are (1) general purpose planning languages and (2) special purpose planning languages. General purpose planning languages allow users to perform many routine tasks like-retrieving various data from a database or performing statistical analysis. The languages in most electronic spreadsheets are good example of general purpose planning languages. These languages enable the user to tackle a broad range of budgeting, forecasting and other worksheet oriented problems. Special purpose planning languages are more limited. Some statistical languages, such as SAS, SPSS and Minitab are examples of special purpose planning languages.

(iv) Model Base: The model base is the "brain" of the decision support system because it performs data manipulation and computations with the data provided to it by the user and the database. There are many types of model bases but most of them are custom-developed models that do some type of mathematical functions. The analysis provided by the routine in the model base is the key to supporting the user's decision.

Question 16

Identify and justify the type of each one of the following systems based on how they perform within an environment and/or certainty/ uncertainty:

i. Marketing system

ii. Communication system

iii. Manufacturing system

iv. Pricing system

v. Hardware-Software system. *(5 Marks, November 2009)*

Answer

	System Type	Justification
(i) Marketing system	Open System	The marketing system plays a pivotal role in the running of a business in the competitive environment. The objective of the system is to maximize customer satisfaction by providing a free interactive environment. The system takes input/feedbacks and facilitates the outcomes as products of the company and to create new customers.
(ii) Communication System	Open System	The communication system in a organization is a point of contact to balance the external influence and render its services to the customers. The system interacts freely with its environment by taking input and returning output.
(iii) Manufacturing System	Closed System	This system is in place to meet a particular objective. It does not interact neither with the environment nor changes with the change in the environment. A manufacturing unit is completely isolated from its environment for its operation.
(iv) Pricing System	Probabilistic and Open System	The system has a probable behavior and interacts freely with its environment by taking inputs and returning outputs. The pricing system is a dynamic one which influences the form of profit and goodwill of an organization.
(v) Hardware-Software System	Closed Deterministic System	Since the interaction among the parts of the system is known with certainty and does not interact with the environment and does not change with the change in the environment. Here the requirements of the hardware and software inventory are known with certainty. The operational state of these systems is in a predictable manner.

Question 17

Discuss some of the important advantages of Information Systems in business.

(5 Marks, May 2010)

Answer

Following are some of the important implications of Information Systems in business:

- Information Systems help managers in efficient decision-making to achieve organizational goals.
- An organization will be able to survive and thrive in a highly competitive environment on the strength of a well-designed Information system.
- Information Systems help in making right decision at the right time i.e. just on time.
- A good Information System May help in generating innovative ideas for solving critical problems.
- Knowledge gathered though Information systems May be utilized by managers in unusual situations.
- Information System is viewed as a process; it can be integrated to formulate a strategy of action or operation.

Question 18

What are the characteristics of Executive Information System? *(4 Marks, May 2011)*

OR

What is meant by EIS? What are its characteristics? *(6 Marks, November 2012)*

Answer

Executive Information Systems (EIS): It is sometimes referred to as an Executive Support System (ESS) too. It serves the strategic level i.e. top level managers of the organization. ESS creates a generalized computing and communications environment rather than providing any preset applications or specific competence.

Characteristics of EIS: Major Characteristics of an EIS are given as follows:

- EIS is a Computer-based-information system that serves the information need of top executives.
- EIS enables users to extract summary data and model complex problems without the need to learn query languages statistical formulas or high computing skills.
- EIS provides rapid access to timely information and direct access to management reports.
- EIS is capable of accessing both internal and external data.
- EIS provides extensive online analysis tool like trend analysis, market conditions etc.
- EIS can easily be given as a DSS support for decision making.

Question 19

Discuss important characteristics of Computer based Information Systems in brief.

(4 Marks, May 2011)

Answer

Major characteristics of Computer based Information Systems are given as follows:

- All systems work for predetermined objectives and the system is designed and developed accordingly.
- In general, a system has a number of interrelated and interdependent subsystems or components. No subsystem can function in isolation; it depends on other subsystems for its inputs.
- If one subsystem or component of a system fails; in most of the cases, the whole system does not work. However, it depends on 'how the subsystems are interrelated'.
- The way a subsystem works with another subsystem is called interaction. The different subsystems interact with each other to achieve the goal of the system.
- The work done by individual subsystems is integrated to achieve the central goal of the system. The goal of individual subsystem is of lower priority than the goal of the entire system.

Question 20

Discuss the constraints in operating a MIS. *(4 Marks, May 2012)*

OR

Write a short note on Limitations of MIS. *(4 Marks, November 2012)*

'There are various constraints, which come in the way of operating an MIS'. Explain any four such constraints in brief.

Answer

Four major constraints, which come in the way of operating an MIS, are given as follows:

- Non-availability of experts, who can diagnose the objectives of the organization and provide a desired direction for installing a system, which operates properly. This problem May be overcome by grooming internal staff, which should be preceded by proper selection and training.
- Experts usually face the problem of selecting which sub-system of MIS should be installed and operated first. The criteria, which should guide the experts, depend its need and importance.
- Due to varied objectives of business concerns, the approach adopted by experts for designing and implementing MIS is no-standardized.

- Non-cooperation from staff is a crucial problem, which should be handled tactfully. This can be carried out by organizing lectures, showing films and also explaining to them the utility of the system. Besides this, some staff should also be involved in the development and implementation of the system to buy-in their participation.

Question 21

Explain any four features of Electronic Mail. *(4 Marks, November 2012)*

Answer

Major features of an Electronic Mail are given as follows:

- Electronic transmission: The transmission of messages with email is electronic and message delivery is very quick, almost instantaneous. The confirmation of transmission is also quick and the reliability is very high.
- Online development and editing: The email message can be developed and edited online before transmission. The online development and editing eliminates the need for the use of paper/s in communication. It also facilitates the storage of messages on magnetic media, thereby reducing the space required to store the messages.
- Broadcasting and Rerouting: Email permits sending a message to a large number of target recipients. Thus, it is easy to send a circular to all the branches of a bank using Email resulting in a lot of saving of papers. The email could be rerouted to people having direct interest in the message with or without changing or/and appending related information to the message.
- Integration with other Information systems: The E-mail has the advantage of being integrated with the other information systems. Such an integration helps in ensuring that the message is accurate and the information required for the message is accessed quickly.
- Portability: Email renders the physical location of the recipient and sender. The email can be accessed from any Personal computer equipped with the relevant communication hardware, software and link facilities.
- Economical: The advancements in communication technologies and competition among the communication service providers have made Email the most economical mode for sending messages. Since the speed of transmission is increasing, the time and cost on communication media per page is falling further, adding to the popularity of email. The email is proving to be very helpful not only for formal communication but also for informal communication within the business enterprise.

Question 22

How does Executive Information System differs from Traditional Information System?

(4 Marks, May 2013)

Answer

Executive Information Systems differs from Traditional Information Systems in many ways. The following table presents the difference on various related dimensions:

Dimensions of Difference	Executive Information System	Traditional Information System
Level of management	For top or near top executives	For lower staff
Nature of Information Access	Specific issues/problems and aggregate reports	Status reporting
Nature of information provided	Online tools and analysis	Offline status reporting
Information Sources	More external, less internal	Internal
Drill down facility to go through details at successive levels	Available	Not available
Information format	Text with graphics	Tabular
Nature of interface	User-friendly	Computer-operator generated

Question 23

What is an Expert System? List the properties which an application should possess to qualify for Expert System development. *(6 Marks, May 2013)*

Or

What do you mean by an Expert System? Briefly explain some of the properties that potential applications should possess to qualify for an expert system development.

(6 Marks, November 2014)

Answer

Expert System: An Expert System is highly developed Decision Support System (DSS) that utilizes the knowledge generally possessed by an expert to solve a problem. Expert Systems are software systems that imitate the reasoning processes of human experts and provide decision makers with the type of advice they would normally receive from such expert systems. For instance, an expert system in the area of investment portfolio management might ask its user a number of specific questions relating to investments for a particular client like – how much can be invested. Does the client have any preferences regarding specific types of securities?

Major properties that an application should possess to qualify for Expert System development are given as follows:

- Availability: One or more experts are capable of communicating 'how they go about solving the problems to which the Expert System will be applied'.
- Complexity: Solution of the problems for which the Expert Systems will be used is a complex task that requires logical inference processing, which would not be easily handled by conventional information processing.
- Domain: The domain, or subject area, of the problem is relatively small and limited to a relatively well-defined problem area.
- Expertise: Solutions to the problem require the efforts of experts. That is, only a few possess the knowledge, techniques, and intuition needed.
- Structure: The solution process must be able to cope with ill-structured, uncertain, missing, and conflicting data, and a dynamic problem-solving situation.

Question 24

Define Transaction Processing System (TPS). List out the salient features of a TPS.

(6 Marks, November 2013)

Answer

Transaction Processing System (TPS): TPS at the lowest level of management is an information system that manipulates data from business transactions. Any business activity such as sales, purchase, production, delivery, payments or receipts involves transaction and these transactions are to be organized and manipulated to generate various information products for external use. TPS records and manipulates transaction data into usable information.

The salient features of a TPS are given as follows:

- Large volume of data: As TPS is transaction – oriented, it generally consists large volumes of data and thus requires greater storage capacity. Their major concern is to ensure that the data regarding the economic events in the organizations are captured quickly and correctly.
- Automation of basic operations: Any TPS aims at automating the basic operations of a business enterprise and plays a critical role in day-to-day functioning of the enterprise. Any failure in the TPS for a short period of time can play havoc with the functioning of the enterprise. Thus, TPS is an important source of up-to-date information regarding the operations in the enterprise.
- Benefits are easily measurable: TPS reduces the workload of the people associated with the operations and improves their efficiency by automating some of the operations. Most of these benefits of the TPS are tangible and easily measurable. Therefore, cost

benefit analysis regarding the desirability of TPS is easy to conduct. As the benefits from TPS are mainly tangible, the user acceptance is easy to obtain.

- Source of input for other systems: TPS is the basic source of internal information for other information systems. Heavy reliance by other information systems on TPS for this purpose makes TPS important for tactical and strategic decisions as well.

Question 25

An owner of a small local store is currently using manual system for his day to day business activities viz. purchase, sales, billing, payments receipts etc. In the last few years, turnover of the store is increased manifold and now it has become increasingly difficult to handle all these activities manually. You being an IT expert and his auditor, are requested to suggest which operation support system will be most suitable for him. Also advise him what activities can be performed by the proposed system and what are major limitation of it. ***(6 Marks, May 2014)***

Answer

In the given scenario, we would suggest the owner of the local store to go for Transaction Processing System (TPS), which will be the most suitable option for him. Because TPS at the lowest level of management is an information system that manipulates data from business transactions efficiently and if properly computerized, TPS provides speed and accuracy too. Various day-to-day business activities such as sales, purchase, production, billing, payments or receipts involves transactions and these transactions are to be organized and manipulated to generate various information products for external use.

Following are the major activities, which can be performed by the proposed TPS:

- Capturing data to organize in files or databases;
- Processing of files / databases using application software;
- Generating information in the form of reports;
- Processing of queries from various quarters of the organization.

A TPS May follow periodic data preparation and batch processing (as in payroll application) or on-line processing (as in inventory control application). In industries and business houses, now-a-days, on-line approach is preferred as it provides information with up-to-date status.

However, the people involved in TPS, usually are not in a position to take any management decision. This is the major limitation of it.

Question 26

Modem business uses Information Technology to carry out basic functions including systems for sales, advertisement, purchase, Management reports etc. Briefly discuss some of the IT tools crucial for business growth. ***(6 Marks, November 2014)***

Answer

(a) Some of the IT tools crucial for business growth are as follows:

- Business Website – By having a website, enterprise/business becomes reachable to large amount of customers. In addition, it can also be used in an advertisement, which is cost effective and in customer relationship management.
- Internet and Intranet – Time and space are no obstacles for conducting meeting of people working in a team from multiple locations, or with different vendors and companies. Intranet is system that permits the electronic exchange of business data within an organization, mostly between managers and senior staff. E-commerce among partners (suppliers, wholesalers, retailers, distributors) using intranets, e-mail etc. provides new platform to the business world for conducting business in a faster and easier way.
- Software and Packages – DBMS, data warehousing, data mining tools, knowledge discovery can be used for getting information that plays important role in decision making that can boost the business in the competitive world. ERP is one of the latest high-end solutions that streamlines and integrates operation processes and information flows in the company to synergize major resources of an organization.
- Business Intelligence – Business Intelligence (BI) refers to applications and technologies that are used to collect; provide access and analyze data and information about companies operations. Some BI applications are used to analyze performance or internal operations e.g. EIS (executive information system), business planning, finance and budgeting tools; while others are used to store and analyze data e.g. Data mining, Data Warehouses, Decision Support System etc. Some BI applications are also used to analyze or manage the human resources e.g. customer relationship and marketing tools.
- Computer Systems, Scanners, Laptop, Printer, Webcam, Smart Phone etc. – Webcam, microphone etc. are used in conducting long distance meeting. Use of computer systems, printer, and scanner increases accuracy, reduce processing times, enable decisions to be made more quickly and speed up customer service.