CAP-III, MICS, June 2012

Suggested Answer

Roll No…………….   **Maximum Marks - 100**

Total No. of Questions - 6   **Total No. of Printed Pages -1**

Time Allowed - 3 Hours

Marks

Attempt all questions.

1.

a) Explain the computer based management information system and business perspective of information system.   **(5+5=10)**

b) What is the purpose of transaction processing system? Differentiate between master data and transaction data.   **(4+6=10)**

Answer No.1

a) As long as organizations are small and have limited operational goals manual information systems are satisfactory. Many trends in the development of industry and commerce have made computer-based information systems essential to efficiently run organizations. These are:

- The size of organizations is becoming larger. This is particularly true in India due to increase in population and rapid rate of industrial development.

- Computer-based processing enables the same data to be processed in many ways. Based on needs, thereby allowing managers to look at the performance of an organization from different angles.

- As the volume of data has increased and the variety of information and their timeliness is now of great importance, computer-based information processing has now become essential for efficiently managing organizations.

- Organizations are now distributed with many branches.

- Markets are becoming competitive. To maintain favorable balance of payments in a country, organizations have to be internationally competitive.

- The general socio-economic environment demands more up to date and accurate information. Human society is changing faster than ever before. Governmental regulations have become complex. Organizations have to interact with many other interested parties such as consumer groups, environmental protection groups, financial institutions, etc., which did not exist before.

Information system has become an integrated into our daily business activities as

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accounting, finance, operations management, marketing, human resource management, or any other business function. Information systems and technologies are vital components of successful business and organization—some would say they are business imperatives. They thus constitute an essential field of study in business administration and management, which is why most business majors include a course in information systems. Since you probably intend to be a manager, entrepreneur, or business professional, it is just as important to have a basic understanding of information systems as it is to understand any other functional area in business.

Information technologies, including Internet-based information systems, are playing vital and expanding roles in business. Information technology can help all kinds of business improve the efficiency and effectiveness of their business processes, managerial decision making, and workgroup collaboration, which strengths their competitive positions in rapidly changing marketplaces. This benefit occurs whether the information technology is used to support product development teams, customer support processes, e-commerce transactions, or any other business activity. Information technologies and systems are, quite simply, an essential ingredient for business success in today's dynamic global environment.

While there are seemingly endless numbers of software applications, there are three fundamental reasons for all business applications of information technology. They are found in the three vital roles that information systems can perform for a business enterprise:

- Support of business processes and operations
- Support of business decision making
- Support competitive advantages.

Support of business processes and operations: involves dealing with information systems that support the business processes and operations in a business. . For example, most retail stores now use computer based information system help their employees record customer purchases, keep track of inventory, pay employees, buy new merchandise, and evaluate sales trends. Store operations would grind to a halt without the support of such information systems.

Support of Business decision making: Information systems also help store managers and other business professionals make better decisions. For example, decisions about what lines of merchandise need to be added or discontinued and what kind of investments they require are typically made after an analysis provided by computer-based information systems. This function not only supports the decision making of store managers, buyers and others, but it also helps them look for ways to gain an advantage over other retailers in the competition for customers.

Support Competitive Advantage – help decision makers to gain a strategic advantage over competitors requires innovative use of information technology. For example, store management might make a decision to install to touch –screen kiosks in all stores, with links to the e-commerce web site for online shopping. This offering might attract new customers and build customer loyalty because of the ease of shopping and buying merchandise provided by such information systems. Thus, strategic information systems

can help provide products and services that give a business a comparative advantage over its competitors.

b) Transaction processing system processes transactions and produces reports. Business transactions occur when a company produces a product or provides a service. The transaction processing system supports the monitoring, collection, storage, processing and dissemination of the organization's basic business transactions. Transaction processing systems are those business systems which process day-to-day transactions of an organization to carry out its business operations. Every transaction may generate additional transactions. For example, when transaction of a purpose takes place, it would change the inventory level, accounts payable etc. The information system that supports these transaction processes is the transaction processing system. Transaction processing system is the backbone of an organization's information system. Transaction processing systems provide the base for all other internal information support.

Master data is generally permanent data that remains with the system as long as the system is in use. Master data is the main data used by the system. For example, an inventory control system could have an inventory master file with one record for each item in inventory .Each record contains fields for the item number, item description, unit cost, unit price and quantity on hand.

Transaction data is data about transactions that have occurred. Transaction data is data about transactions that have occurred. For example, in an inventory control system, an inventory transaction file could be used to store data about additions to and removals from stock. Each record contains fields for item number, the additions to stock and issues from stock. Transaction data generally with the system only until the transactions are processed. The transaction data is then replaced with other transaction data for new transactions. Master and transaction data may be stored in data files or databases; which would form the stored data component of the system.

2.

a) What is IT infrastructure? Briefly explain the concept of grid computing. **(1+4=5)**

b) What is software development life cycle? List out the phases of software development life cycle and explain the maintenance phase of software development life cycle. **(1+1+3=5)**

c) Explain spiral model of software development. **5**

d) Identify and describe the stages of IT infrastructure evolution. **5**

Answer No.2

a) IT infrastructure is the shared technology resources that provide the platform for the firm's specific information system applications. IT infrastructure includes hardware, software and services that are shared across the entire firm. Major IT infrastructure components include computer hardware platforms, operating system platform, enterprise software platforms, networking and telecommunications platforms, database management software, internet platforms, and consulting services and systems integrators.

Grid computing is a term referring to the federation of computer resources from multiple administrative domains to reach a common goal. The **grid** can be thought of as a

distributed system with non-interactive workloads that involve a large number of files. What distinguishes grid computing from conventional high performance computing systems such as cluster computing is that grids tend to be more loosely coupled, heterogeneous, and geographically dispersed. Although a grid can be dedicated to a specialized application, it is more common that a single grid will be used for a variety of different purposes. Grids are often constructed with the aid of general-purpose grid software libraries known as middleware.

Grid size can vary by a considerable amount. Grids are a form of distributed computing whereby a **"super virtual computer"** is composed of many networked loosely coupled computers acting together to perform very large tasks. For certain applications, "distributed" or "grid" computing, can be seen as a special type of parallel computing that relies on complete computers (with onboard CPUs, storage, power supplies, network interfaces, etc.) connected to a network (private, public or the Internet) by a conventional network interface, such as Ethernet. This is in contrast to the traditional notion of a supercomputer, which has many processors connected by a local high-speed computer bus

b) The entire process from the need of the system being felt till the system is used and ultimately declared absolutely reliable forms the life cycle of the system

The period of time that begins when a system is conceived and ends when a system is fully operational for use and gets maintained is called the software ware development life cycle of a system.

The various phases of software development life cycle are

- System investigation
- System analysis
- System design
- System implementation
- Systems maintenance

System maintenance

Once a system is fully implemented and is being used in business operations, the maintenance function begins. *System maintenance* is the monitoring, evaluating, and modifying of operational e-business systems to make desirable or necessary improvements. The maintenance function includes:

- A *post-implementation review* process to ensure that newly implemented systems meet the e-business objectives established for them.

- Correcting errors in the development or use of the system. This includes a periodic review or audit of a system to ensure that it is operating properly and meeting its objectives.

- Making modifications to an e-business system due to changes in the business organization or the business environment.

c) The spiral model, also known as the spiral lifecycle model, is a systems development method (SDM) used in information technology (IT). This model of development combines the features of the prototyping model and the waterfall model. The spiral model is intended for large, expensive, and complicated projects.
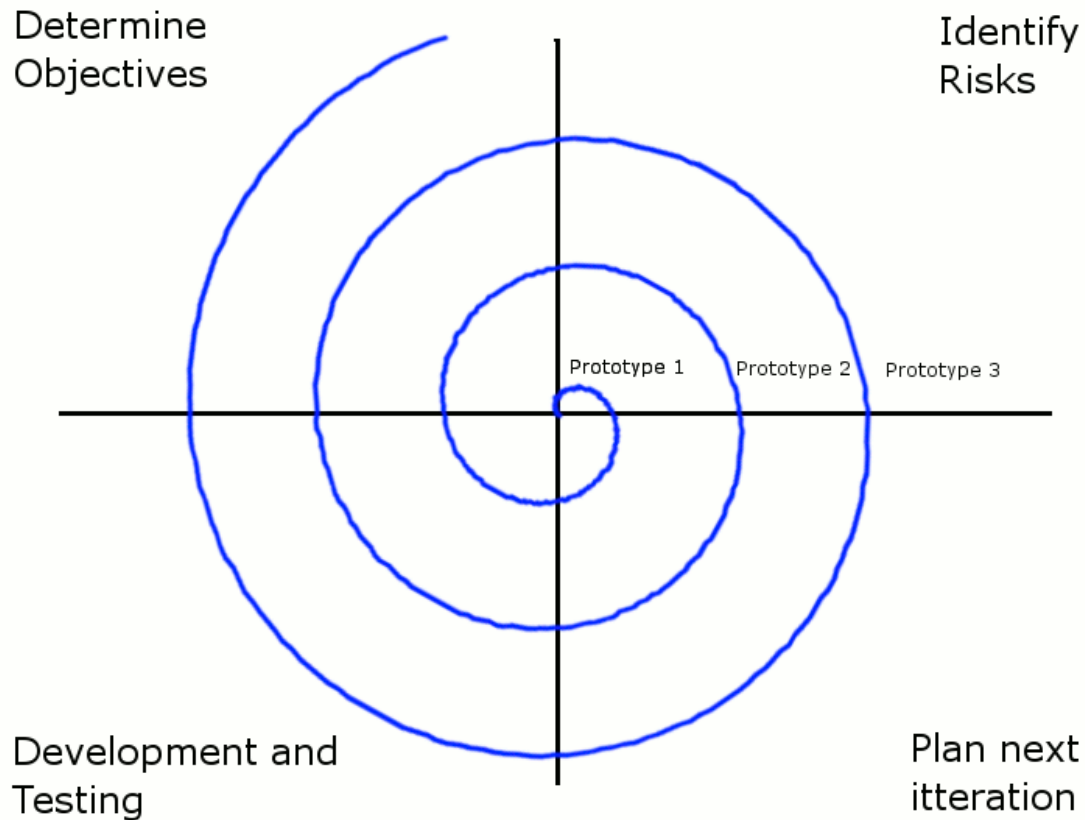
The steps in the spiral model can be generalized as follows:

1. The new system requirements are defined in as much detail as possible. This usually involves interviewing a number of users representing all the external or internal users and other aspects of the existing system.

2. A preliminary design is created for the new system.

3. A first prototype of the new system is constructed from the preliminary design. This is usually a scaled-down system, and represents an approximation of the characteristics of the final product.

4. A second prototype is evolved by a fourfold procedure: (1) evaluating the first prototype in terms of its strengths, weaknesses, and risks; (2) defining the requirements of the second prototype; (3) planning and designing the second prototype; (4) constructing and testing the second prototype.

5. At the customer's option, the entire project can be aborted if the risk is deemed too great. Risk factors might involve development cost overruns, operating-cost miscalculation, or any other factor that could, in the customer's judgment, result in a less-than-satisfactory final product.

6. The existing prototype is evaluated in the same manner as was the previous prototype, and, if necessary, another prototype is developed from it according to the fourfold procedure outlined above.

7. The preceding steps are iterated until the customer is satisfied that the refined prototype represents the final product desired.

8. The final system is constructed, based on the refined prototype.

9. The final system is thoroughly evaluated and tested. Routine maintenance is carried out on a continuing basis to prevent large-scale failures and to minimize downtime

d) There are five stages of IT infrastructure evolution. IT infrastructure in the earliest edge consisted of specialized electronic accounting machines that were primitive computers used for accounting tasks. IT infrastructure in the mainframe era consist of a mainframe performing centralized processing that could be networked to thousands of terminal and eventually some decentralized and departmental computing using networked minicomputers. The personal computer era in IT infrastructure has been dominated by the widespread use of standalone desktop computers with office productivity tools. The predominant infrastructure in the client server era consists of desktop or laptop clients network to more powerful server computers that handle most of the data management and processing. The enterprise internet computing era is defined by large numbers of PCS linked into local area networks and growing use of standards and software to link disparate networks and devices into an enterprise wide networks so that information can flow freely across the organization.

3.

a) Discuss about Business Process Reengineering.   **5**

b) What are the ethical issues related with technology?   **5**

c) Explain about the roles of Information System Auditor.   **5**

Answer No.3

a) Many companies are trying to optimize their business activity with the proper utilization of the Information Technology. But it is not guaranteed that with the use of IT only optimizes the business activities. There might be redundant procedures in the organizational business. If such redundant procedures prevail in the business activity the use of IT does not improve performance as expected. Thus the business process reengineering is the radical restructuring of the organizational business process without effecting overall target with possible reduction of the redundant procedures. Thus if an organization rethink and radically redesign their business process before applying the computing power, they can potentially obtain very large payoffs from their investment in Information Technology.

Steps involve in effective reengineering are:

- Development of broader strategic vision by the senior management for the redesign of the business process

- Measuring and understanding the performance of existing process as baseline

- Using tools of IT for the work flow management and parallel documentation

- The IT facilities should able to support the changes recommended

b) The ethical issues related with the technologies are:

Information Rights:

It should be clear that what information rights do individuals and organizations possess with respect to information about themselves. What they can protect? And at the same time it should be clear what obligations do they have concerning those in formations.

Property Rights:

It should clear about how the traditional intellectual property rights can be protected in the digital form.

Accountability and Control:

It should be clear who is accountable and liable to any form of harm done to individual.

System Quality:

It should clear define the standards of system to be used to protect individual and societal rights.

Quality of Life:

It should be clear about the values, cultures and practices of societies that are supported and preserved by the information technologies.

c) The purpose of auditing of Information System is to review and evaluate the internal controls that protect the system. When performing an IS audit, the auditor should ascertain that the following objectives are met:

- Securities of Information Technology are met and the data are protected from the intruders

- The System Development or acquisition processes are in accordance with management's general procedures.

- The modifications have the permissions from the authorities.

- The data processing is accurate.

- The bugs identified and handles according to the prescribed process

4.

a) Define e-commerce. Discuss on the legal and ethical issues in electronic commerce. **(2+5=7)**

b) How could sales force automation affect sales person productivity, marketing management and competitive advantage? **8**

Answer No.4

a) 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.

Major legal and ethical issues in e-commerce are

- Privacy

- Intellectual property

- Free speech

- Taxation

- Computer crimes

- Consumer protection

- Electronic contracts

- Online gambling

- Validity of electronic documents

- Time and date on documents across borders

- Which country has jurisdiction over E-commerce transaction?

- Can website link to another without permission? Example Ticket master Vs Microsoft,

b) Sales force automation is the use of computers to automate sales recording and reporting by sales people as well as communications and sales support. It improves productivity by saving time otherwise spent on manual creation of records, reports, and presentations; it improves communications and accessibility to information to support sales activities; and it may help in planning sales tactics.

Increasingly, computers and networks are providing the basis for sales force automation. In many companies, the sales force is being outfitted with notebook computers that connect them to Web browsers, and sales contact management software that connect them to marketing websites on the Internet, extranets, and their company intranets. Sales force automation has resulted in increasing the personal productivity of salespeople, dramatically speed up the capture and analysis of sales data from the field to marketing managers at company headquarters, allows marketing and sales management to improve the delivery of information and the support they provide to their salespeople. Many companies view sales force automation as a way to gain a strategic advantage in sales productivity and marketing responsiveness.

5.

a) Why are systems vulnerable? Mention the common threats against contemporary information system.   **(3+2=5)**

b) Explain about public key encryption.   **5**

c) Briefly explain the information system control and audit.   **5**

Answer No.5

a) Information systems are vulnerable to technical, organizational, and environmental threats from internal and external sources. The weakest link in the chain is poor system management. If managers at all levels don't make security and reliability their number one priority, then the threats to an information system can easily become real. The figure below gives some of the threats to each component of a typical network.
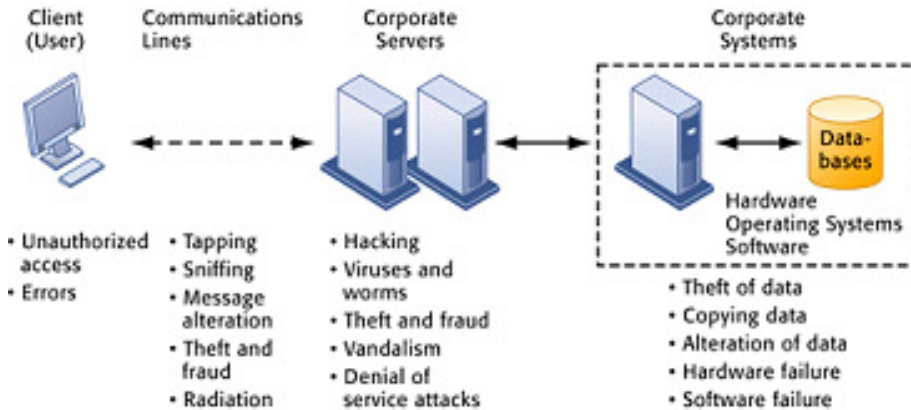

Common threats against contemporary information system are

- Errors and Omissions

- Fraud and Theft

- Employee Sabotage

- Loss of Physical and Infrastructure Support

- Malicious Hackers

- Industrial Espionage

- Malicious Code

- Malicious Software

    o Virus

    o Worms

    o Trojan horse

- Threats to Personal Privacy

b) Public key encryption, also known as asymmetric encryption, is based on a public/private key pair. The keys are mathematically linked, so that data encrypted with the public key can only be decrypted with the corresponding private key.

With public key encryption, the sender converts the plaintext message into cipher text by encrypting it with the public key in the message recipient's X.509 certificate. The message recipient converts the cipher text back into the plaintext message by decrypting it with the corresponding private key.

Figure 1 illustrates how public key encryption and decryption take place.
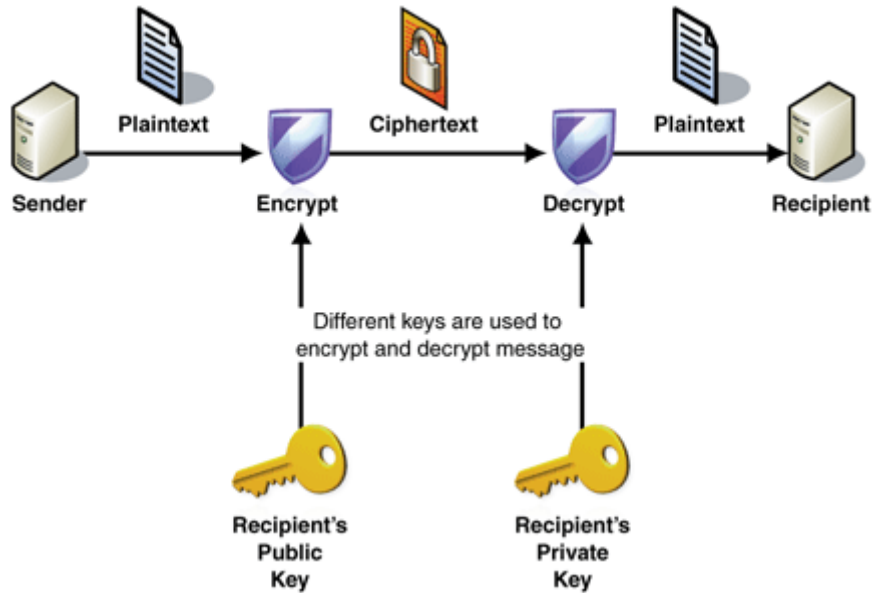
Figure 1. Public key data encryption and decryption

By using public key encryption, a message sender has assurance that only the recipient will be able to read the message.

c) Information systems controls are methods and devices that attempt to ensure the accuracy, validity, and propriety of information system activities. Information System (IS) controls must be developed to ensure proper data entry, processing techniques, storage methods, and information output. IS controls are designed to monitor and maintain the quality and security of the input, processing, output, and storage activities of any information system.

Information systems Business systems should be periodically examined, or audited, by a company's internal auditing staff or external auditors from professional accounting firms. Such audits should review and evaluate whether proper and adequate security measures and management policies have been developed and implemented.

An important objective of e-business system audits is testing the integrity of an application audit trail. An **audit trail** can be defined as the presence of documentation that allows a transaction to be traced through all stages of its information processing. The audit trail of manual information systems was quite visible and easy to trace, however, computer-based information systems have changed the form of the audit trail.

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

   a) Expert system

   b) Joint application development

   c) Electronic fund transfer

   d) Supply chain management

   e) Internet security

Answer No.6

a) Expert system

One of the most practical and widely implemented applications of artificial intelligence in business is the development of expert systems and other knowledge-based information systems. A knowledge based information system (KBIS) adds a knowledge base to the major components found in other types of computer based information systems. An expert system (ES) is a knowledge-based information system that uses its knowledge about a specific, complex application area to act as expert consultant users. Expert systems provide answers to questions in a very specific problem area by making human like inferences about knowledge contained in a specialized knowledge base. They must also be able to explain their reasoning process and conclusions to a user, so expert systems can provide decision support to end users in the form of advice from an expert consultant in a specific problem area.

b) Joint application development

Joint application development (JAD) was introduced as a technique that complements other systems analysis and design techniques by emphasizing participative development among system owners, users, designers, and builders. Thus, JAD is frequently used in conjunction with the above design techniques. During the JAD sessions for systems design, the systems designer will take on the role of facilitator for possibly several full—day workshops intended to address different design issues and deliverables.

c) Electronic fund transfer

Electronic Funds Transfer (EFT) is a system of transferring money from one bank account directly to another without any paper money changing hands. One of the most widely-used EFT programs is Direct Deposit, in which payroll is deposited straight into an employee's bank account, although EFT refers to any transfer of funds initiated through an electronic terminal, including credit card, ATM, and point-of-sale (POS) transactions. It is used for both credit transfers, such as payroll payments, and for debit transfers, such as mortgage payments.

The growing popularity of EFT for online bill payment is paving the way for a paperless universe where checks, stamps, envelopes, and paper bills are obsolete. The benefits of EFT include reduced administrative costs, increased efficiency, simplified bookkeeping, and greater security. However, the number of companies who send and receive bills through the Internet is still relatively small.

d) Supply chain management

Today, many organizations are expending effort on enterprise applications that extend support beyond their core business functions. Companies are extending their core business applications to interoperate with their suppliers and distributors to more efficiently manage the flow of raw materials and products between their respective organizations. These supply chain management (SCM) applications utilize the Internet as a means for integration and communications.

For that reason, several of these businesses will implement supply chain management using SCM software technology to plan, implement, and manage the chain. Examples of supply chain management vendors are listed in the margin. (It should be noted that several ERP application vendors are extending ERP software applications to include SCM capabilities. SCM applications are significant to systems analysts for the same reasons as stated for ERP applications. As an analyst, you may be involved in the evaluation and selection of an SCM package. Or you may be expected to implement and perhaps customize such packages to meet the organizations needs. And again, you may expect to participate in redesigning existing business processes to work appropriately with the SCM solution.

e) Internet security

Internet security is a branch of computer security specifically related to the Internet. Its objective is to establish rules and measures to use against attacks over the Internet. The Internet represents an insecure channel for exchanging information leading to a high risk of intrusion or fraud, such as phishing. Different methods have been used to protect the transfer of data, including encryption.

When a computer connects to a network and begins communicating with other computers, it is essentially taking a risk. Internet security involves the protection of a computer's Internet account and files from intrusion of an unknown user. Basic security measures involve protection by well selected passwords, change of file permissions and back up of computer's data.

Security concerns are in some ways peripheral to normal business working, but serve to highlight just how important it is that business users feel confident when using IT systems. Security will probably always be high on the IT agenda simply because cyber criminals know that a successful attack can be very profitable. This means they will always strive to find new ways to circumvent IT security, and users will consequently need to be continually vigilant. Whenever decisions need to be made about how to enhance a system, security will need to be held uppermost among its requirements.