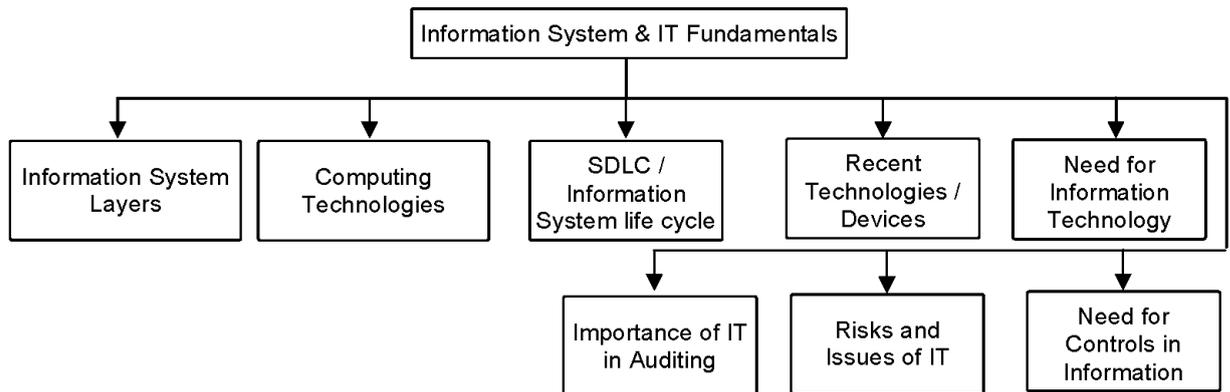


## 2. INFORMATION SYSTEMS AND IT FUNDAMENTALS



### TOPIC 1: INFORMATION SYSTEM CONCEPT & LAYERS

**Q.No.1. Define Information System? Write about Information System components. (B)**  
 (PM, N14RTP, N15 MTP1 - 5M, N15 MTP2 - 2M, M16 MTP1 - 4M, N16 MTP1 - 4M, M17MTP1 - 2M)

**Information System:**

(M15RTP)

- a) It is a set of interrelated components working together to collect, retrieve, process, store and disseminate (distribute) information for the purpose of achieving objectives such as planning, coordination, analysis and decision making.
- b) Information System is generally called as Management Information System (MIS) or Computer Based Information System (CBIS).
- c) Information System provides timely information of right quality for better management decision making for developing business strategy.

**Information System components / Layers:**

<b>Hardware Resources</b>	Machines - computers, video monitors, printers, optical scanners. Media - floppy disks, magnetic tape, magnetic disk drives optical disks, plastic cards, paper forms.
<b>Software Resources</b>	Programs - operating system programs, spreadsheet programs, word processing programs, payroll programs. Procedures - data entry procedures, error correction procedures, pay check distribution procedures.
<b>Data Resources</b>	Product descriptions, customer records, employee files, inventory databases.
<b>Network Resources</b>	Communications media, communications processors, network access, control software.
<b>People Resources</b>	Specialists - systems analysts, software developers, systems operators End Users—anyone else who uses information systems
<b>Information Products</b>	Management reports and business documents using text and graphics displays, audio responses, and paper forms.

**Q.No.2. Define the term Application Software? Explain types and mention advantages & disadvantages. (A)**  
 (N15- 4M, N14 MTP1 & 2 - 2M, M15 MTP2 - 4M, N15 MTP1 - 4M, M16 MTP1 - 2M, N16 MTP2 - 4M)

**Application Software:** It is a program or a set programs used for performing useful tasks (or) for specific tasks. (M17MTP - 2M)

The different types of application software are:

- Application Suite:** Has multiple applications(=softwares) bundled together. E.g. MS Office 2010 which has MSWord, MS Excel, MS Access, etc.
- Enterprise Software:** Addresses an enterprise's needs and data flow in a huge distributed environment. E.g. ERP Applications like SAP.
- Enterprise Infrastructure Software:** Provides capabilities required to support enterprise software systems. E.g.: email servers, Security software.
- Information Worker Software:** Addresses individual needs required to manage and create information for individual projects within departments. E.g. Spreadsheets, CAAT (Computer Assisted Audit Tools), etc.
- Content Access Software:** Used to access contents and addresses a desire for published digital content and entertainment. E.g. Media Players, Adobe Digital etc.
- Educational Software:** Holds contents adopted for use by students. E.g. Examination Test CDs
- Media Development Software:** Addresses individual needs to generate and print electronic media for others to consume. E.g. Desktop Publishing, Video Editing etc.



#### Advantages:

- Addressing User needs:** The main advantage of application software is that it meets the exact needs of the user. Since it is designed specifically with one purpose/specific purpose in mind.
- Less threat from virus:** The threat of virus infection to custom-made applications is very small, since any business that incorporates it can restrict access, protect their network as well.
- Regular updates:** Licensed application software gets regular updates from the developer for security reasons. *Additionally, the developer also regularly sends personnel to correct any problems that may arise from time to time.*

#### Disadvantages:

- Development is costly:** Developing application software designed to meet specific purposes can prove to be quite costly for developers.
- Infection from Malware:** If application software is used commonly by many people and shared online, it carries a highly real threat of infection by a computer virus or other malicious Programs.

**Q.No.3. Write about System Software in detail. (Or) What is an OS? Explain functions or activities performed by OS? (A)** (PM, N14RTP, M15RTP, N15RTP)

- System software is computer software designed to operate the computer hardware and to give and maintain a platform for running application software.
- Operating system** is a system program which provides an interface between the user of a computer and the computer hardware.

#### Activities performed by Operating system:

- Performing hardware functions:** OS acts as an intermediary between the application program and the hardware. OS facilitates application programs to perform their tasks such as obtain input, retrieve data and display output.
- User Interfaces:** An important function of any operating system is to provide user interface. Today we are using user-friendly, graphics environment called Graphical User Interface (GUI) which uses icons, windows, graphics or menus.



- c) **Hardware Independence:** Operating systems provides Application Program Interfaces – (API) which can be used by application developers to create application software easily with out the need to understand the inner workings of OS and hardware. This is called hardware independence.
- d) **Memory Management:** OS controls how memory is accessed and maximizes available memory & storage. It also provides Virtual Memory by improving the capacity of RAM. (N16 - 2M)
- e) **Task Management:** Task Management of Operating system helps in allocating resources to make optimum utilization of resources. (N16 RTP)
- f) **Networking Capability:** OS can provide systems with features & capabilities to help connect computer networks or internet. For ex. Linux & Windows 8.
- g) **File management:** OS keeps a track of where each file is stored and who can access it and it also provides the file retrieval.
- h) **Logical access security:** OS provide logical security by establishing a procedure for identification & authentication using a User ID and Password.

**Q.No.4. What is CPU or microprocessor? What are the three functional units of a Central Processing Unit (CPU)? (A) (PM)**

- The Central Processing Unit interprets and executes the program (software) instructions and coordinates how all the other hardware devices work together.
- The CPU contain million of transistors.
- The processor or CPU is like the brain of the computer.
- The main function of CPU is to execute programs stored in main memory.
- It consists of three functional units: (M16 RTP)
  - Control Unit (CU):** CU controls the flow of data and instruction to and from memory, interprets the instruction and controls which tasks to execute and when.
  - Arithmetic and Logical Unit (ALU):** Performs arithmetic operations such as addition, subtraction, multiplication, and logical operations such as AND, OR, NOT and comparison operations such as Equal to, Greater than, Less than, etc.
  - Registers:** These are high speed memory units within CPU for storing small amount of data. (N15 MTP2 - 2M)



**Registers could be:**

- Accumulators:** They can keep running totals of arithmetic values.
- Address Registers:** They can store memory addresses which tell the CPU as to where an instruction is located.
- Storage Registers:** They can temporarily store data that is being sent to or coming from the system memory.
- Miscellaneous:** These are used for several functions for general purpose.

**Q.No.5. Explain various data storage devices? (B)**

**Data Storage Devices** refers to the memory where data and Programs are stored.

Various types of memory techniques/devices are given as follows:

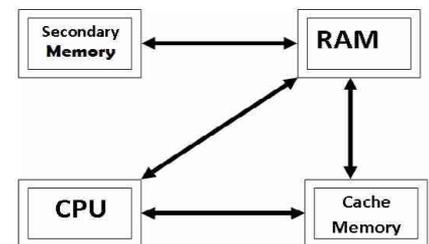
- Internal memory:** This includes processor Registers and cache memory

2. **Primary Memory:** These are the most important memories. These are primarily of two types: (M15 RTP)
- Random Access Memory (RAM):**
    - This is Read Write memory.
    - Information can be read as well as modified (i.e. write).
    - Volatile in nature means Information is lost as soon as power is turned off.
  - Read Only Memory (ROM):** (M17 – 2M, M16 RTP)
    - This is non-volatile in nature (content remains even in absence of power).
    - Usually, these are used to store small amount of information for quick reference by CPU.
    - Information cannot be modified.
    - Generally used by manufacturers to store data & Programs.
3. **Secondary Memory:**
- secondary or permanent or auxiliary storage hold data and Programs permanently.
  - Some of the commonly used secondary storage devices are – magnetic tape drives, magnetic disk drives (Hard disks, floppy disks, etc.), optical disk drives (CDs, DVDs, Blue ray disks etc.)
4. **Cache memory.**
5. **Virtual memory.**

**Q.No.6. Write short notes on cache memory? (B)**

(N14 RTP, M16 MTP2 - 1M)

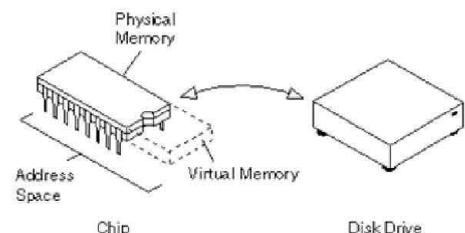
- There is a huge speed difference between Registers and Primary Memory(RAM).
- Cache memory can be used in order to bridge the speed differences between Registers and Primary memory.
- Cache is a smaller, faster memory, which stores copies of most frequently used data from RAM.
- These copies can be accessed by Processor/Registers more rapidly from cache than from main memory.
- The cache acts as temporary memory and boosts processing power.



**Q.No.7. Write short notes on Virtual memory? (B)**

(N14 RTP, M17 - RTP, N14 MTP2 - 1M, M16 MTP1 - 1M)

- Virtual memory is in fact not a separate device but it is an imaginary memory area supported by some operating systems such as Windows in combination with the hardware.
- Most of the today's software's require huge amount of RAM.
- If a computer lacks the RAM needed to run a Program, virtual memory can be used in place of it.
- Virtual memory is an allocation of hard disk space to help RAM.
- Loading of such large size software into smaller size RAM is possible by the facility called Virtual Memory.
- As a part of this facility the large size software gets divided into small parts called modules or pages.



- g) One by one, the modules are loaded into RAM and perform their task. After one module work is over, the next module is loaded on to RAM overwriting the first module.

### SIMILAR QUESTION

1. Which memory improves the RAM capacity? Explain?

### Q.No.8. Define the terms Data, Database, Database Management System (DBMS). (B)

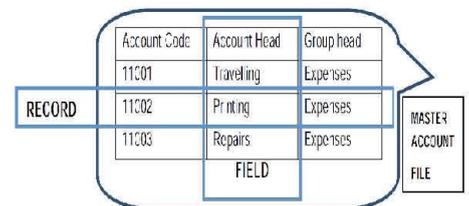
**Data:** Data can be defined as any fact, observation, assumption or occurrence. Data can be in the form of numbers or alphabetical characters or special symbols (=, + %, Rs. etc.).

**Database:** A **Database** is a collection of related data or a database is an integrated collection of logically related records and file.

**Database management system:** Software that enables users to perform the processes of defining, constructing, and manipulating databases for various applications. (M16 RTP)

Briefly the terms can be explained below:

- a) **Characters:** These are a collection of Bits.  
 b) **Field:** This is a collection of Characters.  
 c) **Record:** This is a collection of Fields.  
 d) **File:** This is a collection of Records.  
 e) **Database:** This is a collection of Files.

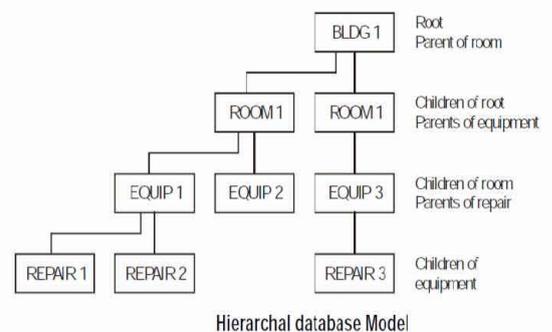


### Q.No.9. What is a Database model? Explain Different types of database models. (C)

- a) A database model is a type of data model that determines the logical structure of a database and fundamentally determines in which manner data can be stored, organized and manipulated.
- b) Some important data models are:
- » Hierarchical Database Model,
  - » Relational Database Model,
  - » Network Database Model,
  - » Object Oriented Database Model.

### Q.No.10. Explain the Hierarchical Database Model in detail ? (or) List the four phases of evolution in the hierarchy of database modelling? (B) (PM, N16 - 2M, M16 MTP2 - 4M)

- a) In a hierarchical database model, records are logically organized in an inverted tree pattern.
- b) All records in hierarchy are called nodes. The top parent record in the hierarchy is called the root record.
- c) Each node is related to the others in a parent-child relationship.
- d) Each parent record may have one or more child records, but no child record may have more than one parent record.
- e) It supports one-to-one and one-to-many relationships
- f) *If a particular record has to be traced then tracing will start from the root, continues downwards until the requisite record is located.*



**Advantages:**

- Facilitates day to day structured operations.
- Data processing becomes more efficient.
- Simple to understand.

**Disadvantages:**

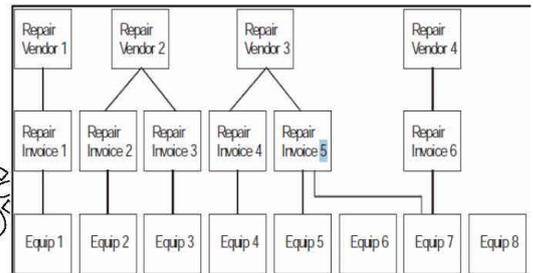
- It can't support many-to-many relationships.
- It requires multiple searches and time consuming.
- Parent node is deleted; all the child nodes get automatically deleted.

**SIMILAR QUESTION:**

- In which database modal we use tree format to store data and records? explain?

**Q.No.11. Explain the Network Database Model in detail. (B) (PM)**

- It is a modified version of hierarchical database. In network database structure each node may have several parents.
- In this model, all types of relationships are allowed, without any restriction. Thus one-to-one, one-to-many, many-to-one and many-to-many relationships are permitted.
- The network model is able to represent redundancy in data more efficiently than in the hierarchical model.
- These structures can be entered and traversed more flexibly.

**Advantages:**

- More flexible than hierarchical database structure.
- They are appropriate to support data with many-to-many and many-to-one relationships.
- Relatively efficient.
- Easy to restructure the information.
- Network data structures can be entered and traversed more flexibly.

**Disadvantages:**

- Very difficult to operate this structure.
- Less user friendly than hierarchical structure.

**SIMILAR QUESTION:**

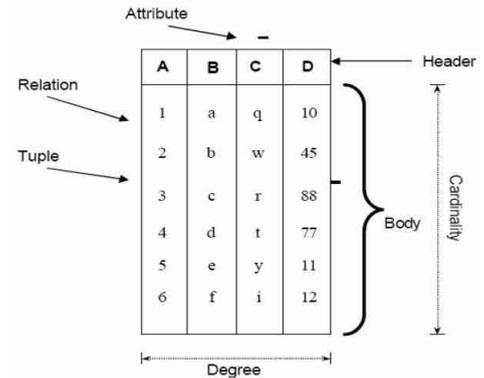
- Which database model is the modified version of hierarchical model? Explain?

**Q.No.12. Explain the Relational Database Model (RDBMS) in detail.(B)**

(PM, M15 RTP, M17-RTP)

- A relational database contains multiple tables. Tables are also called relations.
- A table is a collection of records and each record in a table contains the several fields.
- A relation is a table with columns and rows. The named columns of the relation are called attributes, and the domain is the set of values the attributes are allowed to take.
- Rows are also called as records or tuples.

- e) Any column can be a key ,A key that can be used to uniquely identify a row in a table is called a Primary key.
- f) Multiple columns can be grouped together into a Compound key.
- g) Relationships in relational databases are different from that of relationships in hierarchical and network databases.
- h) A relationship exists between two relations (i.e. tables) because there is a common attribute in the relations.

**Advantages:**

- Highly flexible to Program and retrieve data.
- It is much easier to use.
- Can handle queries in a more efficient way.

**Disadvantages:**

- Processing efficiency is comparatively low.
- Storage space requirements are high.
- Processing can't be done without establishing the relationships.

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**SIMILAR QUESTION:**

- Which database model use tables to store data and records? Explain?

**Q.No.13. Explain Object Oriented Database Model (OODBMS) in detail. (B) (PM, N16 - 2M)**

- It is based on the concept of objects and their interactions.
- An Object-oriented database provides a mechanism to store complex data such as images, audio and video, etc.
- An OODBMS helps programmers to create objects in a programming language, behave as a database object.
- These objects are predefined set of program code that is used to perform a specific task.
- IN OODBMS, new objects can be created or old objects can be modified, reused or copied.
- An OODBMS is a relational database designed to manage all of these independent programs, using the data produced to quickly respond to requests for information by a larger application.
- Expert Systems, Image Processing Systems, Multimedia Systems, Computer Aided Software Engineering (CASE) can also use OODBMS to create or design several applications.

**SIMILAR QUESTION:**

- Which database model use objects to store data and records? Explain?

**Q.No.14. List out the Advantages and Disadvantages of a DBMS. (A) (PM, N15 - 4M, N14RTP)**

**Advantages:**

(M17 – 4M)

- Permitting data sharing:** It is very easy to share same information between different users.
- Minimizing data redundancy:** In a DBMS, redundancy i.e duplication of data or repeated data can be , carefully controlled or reduced. Minimizing redundancy can therefore significantly reduce the cost of storing information on hard drives and other storage devices.
- Program and file consistency:** Using a DBMS, file formats and programs are standardized. This makes the data files easier to maintain because the same rules and guidelines apply across all types of data.

- d) **Integrity can be maintained:** Data integrity is maintained with accurate, consistent, and up-to-date data. Updates and changes to the data only have to be made in one place in DBMS to ensure Integrity.
- e) **User-friendly:** DBMS makes the data access and manipulation easier for the user. DBMS also reduce the dependence of users on computer experts to meet their data needs.
- f) **Improved security:** DBMSs allow multiple users to access the same data resources which could lead to risk to an enterprise if not controlled. Through the use of passwords, DBMS can be used to restrict data access to only those who should see it.
- g) **Data independence:** A database system keeps data separate from the application(=front end) that uses the data. Thus, changes can be made to data definitions without making changes to every application program that uses the data.
- h) **Faster application development:** By using DBMS, application development becomes fast. The data is already available in databases, application developer has to think of only the logic required to retrieve the data in the way a user needs.

#### **Disadvantages:**

- a) **Cost:** Implementing a DBMS system can be expensive, time-consuming, and Training requirements are also quite costly.
- b) **Security:** Even with safeguards in place, it may be possible for some unauthorized users to access the database. If one gets access to database then it could be an all or nothing proposition.

## **TOPIC 2: COMPUTING TECHNOLOGIES**

**Q.No.15. What is Server? Explain different types of servers. (A) (PM, M15 - 4M)**

1. A server is a computer (Hardware) or device on a network dedicated to run one or more services (as a host), to serve the needs of the users or clients.
2. In client-server architecture, a server is a computer Program running to serve the requests of other Programs, called the 'clients'.
3. Servers may be broadly classified as dedicated and non-dedicated.
  - a) A dedicated server is completely reserved for the purpose of serving other computers and no other activity can be performed.
  - b) A non-dedicated server is not completely reserved for this purpose i.e. it can also be used simultaneously for other purposes.
4. There are different types of servers, based on the nature of service they provide.
  - a) **File server:** This is a computer and storage device dedicated to storing files. Any user on the network can store files on the server.
  - b) **Print server:** This is a computer that manages one or more printers.
  - c) **Network server:** This is a computer that manages network traffic.
  - d) **Database server:** This is a computer system that processes database queries.
  - e) **Application Server:** This is a Program that handles all application operations between users and an enterprise's backend applications or databases.
  - f) **Web Servers:** Web servers are computers that deliver (serves up) web pages. Every web server has an IP address and possibly a domain name. For example, if we enter the URL ***http://www.icai.org*** in our browser, this sends a request to the Web server whose domain name is *icai.org*. The server then fetches the home page named and sends it to our browser.
  - g) **Mail Server:** Mail servers move and store mail over corporate networks.



Q.No.16. Describe popular Computing Architectures. (B)

(PM)

**Computing Architectures:**

1. In Computer Engineering, Computer Architecture can be defined as the science and art of selecting and interconnecting hardware components to create computers that meet functional, performance and cost goals. It is the technical drawings and functional description of all design requirements (especially speeds and interconnections); it is how to design and implement various parts of a computer focusing largely on the way by which the CPU operates internally and how it accesses addresses in memory.
2. In other words, the interface between a computer's hardware and its software is Computing architecture.

Computer architecture includes three main subcategories:

**1. Instruction Set Architecture (ISA):****(M15 RTP, N14 MTP1 – 1M)**

- a) *It is the abstract model of a computing system that is seen by a machine language Programmer, including the instruction set, memory address modes, processor registers, and address and data formats*
- b) Basically Instruction Set Architecture (ISA) is related to the Programming of a computer - that is, how the computer understands what each element in its basic language means, what instructions are to be carried out and in what order, etc.
- c) The ISA basically deals with what the chip does. It's a sort of 'bridge' between software and hardware.

**Classification of Instruction Sets:****a) Complex Instruction Set Computer (CISC):****(N15 MTP1 - 2M)**

- i) If the control unit contains a number of micro-electronic circuitry to generate a set of control signals and each micro- circuitry is activated by a micro-code, this design approach is called CISC design.
- ii) Examples of CISC processors are. Intel 386, 486, Pentium, Pentium Pro, Pentium II, Pentium III processors etc.
- iii) *CISC chips have a large, variable length and complex instructions and generally make use of complex addressing modes.*
- iv) But at the same time, they are complex as well as expensive to produce.
- v) Now-a-days, most of the personal computers use CISC processors.

**b) Reduced Instruction Set Computer (RISC):**

- i) To execute each instruction, if there is separate electronic circuitry in the control unit, which produces all the necessary signals, this approach of the design of the control section of the processor is called RISC design. It is also called hard-wired approach.
- ii) Examples of RISC processors: IBM RS6000, MC88100 processors etc. *RISC processors use a small and limited number of instructions and mostly use hardwired control unit.*
- iii) These consume less power and have high performance.
- iv) *However, RISC processors are faster, less complex and less expensive than CISC processors because of their simpler design.*
- v) Now-a-days, most of the workstation computers use RISC processors.

**2. Micro Architecture:****(N14 RTP, M16 RTP, M17-RTP, N14 MTP2-1M, M16 MTP1-1M, M17MTP1 -2M)**

- a) It, also known as Computer Organization. *It is a lower level detailed description of the system that is sufficient for completely describing the operation of all parts of the computing system, and how they are inter-connected and inter-operate in order to implement the ISA.*

- b) The micro architecture can be seen as how the ISA does and what it does.
- c) The micro architecture essentially forms a specification for the logical implementation.
3. **System Design:** It includes all of the other hardware components within a computing system such as:
- a) **System interconnects-Computer buses and switches:** **Computer bus** is a communication system that transfers data between components inside a computer, or between computers. (M15 MTP1 - 1M)
- b) **Memory controllers and hierarchies:** The memory controller is a digital circuit which manages the flow of data going to and from the main memory.
- c) **CPU off-load mechanisms-Direct Memory Access (DMA):** DMA is a feature of modern computers that allows certain hardware subsystems within the computer to access system memory independently of the central processing unit (CPU).
- d) **Issues-multi-processing, virtualization, software features etc.**
- i) **Multiprocessing** is the use of two or more Central Processing Units (CPUs) within a single computer system to allocate tasks between them.
- ii) **Hardware Virtualization or Platform Virtualization** refers to the creation of a virtual machine that acts like a real computer with an operating system. *Software executed on these virtual machines is separated from the underlying hardware resources.*

**Q.No.17. Write briefly about Mobile Computing? (or) What is mobile computing? Discuss its components? (A) (PM, N14 – 4M, N16 - 4M, M15 MTP2 - 4M)**

1. Mobile Computing is the use of portable computing devices, in combination with mobile communications technologies, to enable users to access the Internet and data on their home or work computers, from anywhere in the world.
2. Mobile computing is enabled by use of mobile devices such as PDA, laptops, mobile phones, smart phones, tablet PC and Palmtops on a wireless network.
3. Mobile computing involves Mobile Communication, Mobile Hardware and Mobile Software.
- a) **Mobile Communication:**
- i) Mobile Communication refers to the infrastructure put in place to ensure that seamless(=faultless) and reliable communication goes on.
- ii) These would include devices such as Protocols, Services, Bandwidth and Portals necessary to facilitate and support the services. The data format is also defined at this stage.
- iii) *It will incorporate all aspects of wireless communication.*
- b) **Mobile Hardware:** (M15 RTP)
- i) Mobile Hardware includes mobile devices or device components that receive or access the service of mobility.
- ii) They would range from Portable laptops, Smart phones, Tablet PC's to Personal Digital Assistants.
- iii) These devices will have receptors that are capable of sensing and receiving signals.
- iv) *These devices are configured to operate in full duplex, whereby they are capable of sending and receiving signals at the same time.*
- c) **Mobile Software:** (N15 RTP)
- i) Mobile Software is the actual Program that runs on the mobile hardware.
- ii) It deals with the characteristics and requirements of mobile applications.

- iii) This is the engine of that mobile device.
- iv) *In other terms, it is the essential component that makes the mobile device operates.*

**Q.No.18. Explain Business Applications of Mobile Computing. (B)**

**(M17-RTP, N15 MTP2 - 4M)**

Some examples of business applications are:

- a) There is increase in workforce productivity as mobile device enables employees to work from anywhere, anytime by accessing and updating information as required.
- b) Customer service can be improved by responding to customer queries on site or off site.
- c) Incident management can be improved by resolving problems faster, without limitation of time, as the concerned employees can attend to these regardless of their location.
- d) Enterprises can dynamically modify and update their offerings and offer new products and services altogether.
- e) Mobile computing gives users the freedom to roam, with access to data and services at any time and in any place.
- f) This technology to create innovative opportunities for improving the quality and efficiency of business processes and services.

**SIMILAR QUESTION:**

1. **Benefits of mobile computing in business environment?**

**Q.No.19. Write about the concerns of the Mobile Computing. (B)**

**(PM, N14 – 4M, N16 MTP2 - 2M)**

Major concerns or problems are given as follows

- a) Mobile computing has its fair share of security concerns as any other technology.
- b) **Dangers of misrepresentation** - Another problem plaguing mobile computing is credential verification.
- c) **Power consumption**: When a power outlet or portable generator is not available, mobile computers must rely entirely on battery power.
- d) Potential health hazards.

**SIMILAR QUESTION:**

1. **What are the disadvantages of mobile computing?(or)what are the problems associated with mobile computing?**

**TOPIC 3: INFORMATION SYSTEM LIFE CYCLE**

**Q.No.20. What is Information System Life Cycle? Explain different phases of System development life cycle. (A)**

**(PM, M15 - 2M, N14 RTP, N16 RTP, N14 MTP2 - 4M, M16 MTP1 - 4M, N16 MTP2 - 4M, M17MTP1 -4M)**

1. Information System Life Cycle is also known as Software/System Development Life Cycle (SDLC).
2. It provides a sequence of activities for system designers and developers to build an information system.
3. It consists of a set of phases in which each phase of the SDLC uses the results of the previous one.

4. Various phases for developing an Information System are given as follows:

a) **Phase 1: System Investigation:** This phase examines that 'What is the problem and is it worth solving'? A feasibility study is done under the dimensions – Technical, Economical, Legal, Operational etc. (M16 MTP2 - 2M)

b) **Phase 2: System Analysis:** This phase examines that 'What must the Information System do to solve the problem'?

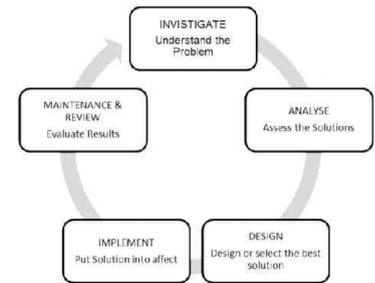
System analyst would be gathering details about the current system and will involve interviewing staff; examining current business; sending out questionnaires and observation of current procedures. .

c) **Phase 3: System Designing:** This phase examines that 'How will the Information System do what it must do to obtain the solution to the problem'? (N15RTP)

d) **Phase 4: System Implementation:** This phase examines that 'How will the solution be put into effect'? (M16 RTP)

This phase involves installation of the new system or conversion of the old system to the new one.

e) **Phase 5: System Maintenance and Review:** This phase evaluates results of solution and modifies the system to meet the changing needs. Post implementation review would be done to address Programming amendments; Adjustment of clerical procedures; Modification of Reports, and Request for new programs.



#### SIMILAR QUESTION:

1. Explain software development life cycle and its phases?

**Q.No.21. Write short notes on feasibility study under systems investigation of SDLC? (B)**  
(M17 – 4M)

Feasibility Study refers to a process of evaluating alternative systems through cost/benefit analysis so that the most feasible/possible and desirable system can be selected for development.

- Technical feasibility:** Does the technology exist to implement the proposed system or is it a practical proposition
- Economic feasibility:** Is proposed system cost-effective.
- Legal feasibility:** Is there any conflict between the proposed system and legal requirements
- Operational feasibility:** Are the current work practices and procedures adequate to support the new system.
- Schedule feasibility or time feasibility:** How long will the system take to develop, or can it be done in a desired time-frame.

#### SIMILAR QUESTION:

1. Explain 1<sup>st</sup> phase of SDLC?

**Q.No.22. Write short notes on fact finding techniques of systems analysis? (B)**

This phase examines the 'What must the Information System do to solve the problem'. System analyst would be gathering details about the current system and will involve:

- Interviewing staff:** at different levels from end-users to senior management;

- b) **Examine current business:** systems documents and output including current order documents, computer system procedures and reports used by operations and senior management;
- c) **Sending out questionnaires:** that have to be carefully constructed to elicit unambiguous answers.
- d) **Observation of current procedures:** by spending time in various departments. A time and motion study can show where procedures could be more efficient or to detect bottlenecks.

**SIMILAR QUESTION:**

1. Explain 2<sup>nd</sup> phase of SDLC?

**Q.No.23. Explain system design phase in SDLC? (B)**

This phase specifies the technical aspects of a proposed system in terms of

- i) **Hardware platform:** Computer, network capabilities, input, storage and output devices;
- ii) **Software:** Programming language, package and database;
- iii) **Outputs:** Report layouts and screen designs;
- iv) **Inputs:** Documents, screen layouts and validation procedures;
- v) **User interface:** How users will interact with the computer system;
- vi) **Modular design:** Of each program in the application;
- vii) **Test plan:** Develop test data;
- viii) **Conversion plan:** How the new system is to be implemented;
- ix) **Documentation:** Including systems and operations documentation. Later, a user manual will be produced.

**SIMILAR QUESTION:**

1. Explain 3<sup>rd</sup> phase of SDLC?

**Q.No.24. Write short notes on changeover or conversion methods on systems implementation. (OR) What are the major activities involved in the conversion phases of system implementation in SDLC. (A) (PM)**

This phase examines 'How the Solution will be put into effect'. This phase involves the following steps:

**In Conversion, there are following major activities: (N16 MTP1 - 4M)**

- a) **Direct Changeover:** The user stops using the old system one particular day and starts using the new system from thereon, usually over a weekend or during a slack period.
- b) **Parallel Conversion:** The old system continues alongside the new system for a few weeks or months.
- c) **Phased Conversion:** Used with larger systems that can be broken down into individual modules which can be implemented separately at different times.
- d) **Pilot Conversion:** New system will first be used by only a portion of the enterprise, for example at one branch or factory.

**SIMILAR QUESTION:**

1. Explain 4<sup>th</sup> phase of SDLC?

**Q.No.25. Write short notes on types of system maintenance. (OR) Explain the system maintenance objectives in SDLC. (B)**

This phase evaluates results of solution and modifies the system to meet the changing needs. Post implementation review would be done to address:

- a) Programming amendments.
- b) Adjustment of clerical procedures.
- c) Modification of Reports.
- d) Request for new Programs.

**System maintenance could be with following different objectives:**

- a) **Perfective Maintenance:** This implies that while the system runs satisfactorily, there is still room for improvement.
- b) **Adaptive Maintenance:** All systems will need to adapt to changing needs within a company.
- c) **Corrective Maintenance:** Problems frequently surface after a system has been in use for a short time, however thoroughly it was tested. Any errors must be corrected.

#### SIMILAR QUESTION

1. Explain 5<sup>th</sup> phase of SDLC?

### **TOPIC 4: RECENT TECHNOLOGIES/DEVICES**

**Q.No.26. Write about Bluetooth technology. (A)**  
(PM, N14-2M, N16 - 2M – PART, N14 RTP, N16 RTP, M15 MTP1-2M)

#### Introduction:

- » Bluetooth is a wireless technology standard for exchanging data over short distances from 30 to 50 meters from fixed and mobile devices.
- » It creates Personal Area Networks (PANs) with high levels of security.



#### Usage:

- a) Using this technology, users can easily exchange files between computers, cellular phones, pagers, and Personal Digital Assistants over short distances.
- b) Users can easily synchronize the information in their portable devices with a desktop or notebook computers.
- c) Mobile phone with Bluetooth allows us to send pictures, videos, exchange business cards and also transfer files to our PC.
- d) Both data and voice transmissions can be sent and received through the use of short range networks.
- e) Bluetooth is really like a low-power, short-range radio signal.
- f) Few devices that utilize Bluetooth technology are: (M16- 2M)
  - i) Keyboards and mouse
  - ii) Printers
  - iii) Cell phones and headsets
  - iv) PDAs (Personal Digital Assistants)
  - v) Desktop and laptop computers
  - vi) Digital cameras.

**Q.No.27. Write about Wi-Fi technology. (A)** (PM, N16 - 2M – PART, M15 MTP1-1M)

- a) Wi-Fi stands for Wireless - fidelity.
- b) Wi-Fi is a popular Wireless networking technology that uses radio waves to provide wireless high-speed Internet and reliable network connections.
- c) Wi-Fi networks have limited range.



- d) A typical wireless access point might have a range from 32 meters to 95 meters.
- e) Wi-Fi is based on '**Institute of Electrical and Electronics Engineers'** IEEE 802.11 to provide secure, reliable, fast wireless connectivity.

**Usage:**

- a) A Wi-Fi network can be used to connect electronic devices to each other, to the Internet, and to wired networks.
- b) Large companies and campuses often use Wi-Fi to connect buildings, meeting rooms, laboratories, Classrooms and large auditoriums. .
- c) Wi-Fi supports built-in flexibility that allows dynamic changes and growth.
- d) Wi-Fi can be less secure than wired connections because an intruder does not need a physical connection.

**Q.No.28. Write about tablet or Tablet computer. (C)****(PM)**

1. A tablet is a one piece general-purpose computer contained in a single panel.
2. It uses touch screen as the input device.
3. Some features of Tablets are:
  - a) **Input Method:** Tablets rely solely on a touch interface on the screen for all input.
  - b) **Size:** Tablets have the size roughly of a small pad of paper and a weight that is less than one Kg.
  - c) **Battery Life:** Tablets can achieve all day usage.
  - d) **Storage Capacity:** Most tablets come with configurations that allow between 16 and 64 gigabytes of storage.
  - e) **Performance:** Since most tablet PCs are based on extremely low powered processors more suited for tasks like email, web browsing, playing video or audio.
  - f) **Software:** The two major tablet platforms are Android and iOS, amongst plenty of applications that are available.
  - g) **Wireless:** Because tablets by design are mobile computers, most of them have Wi-Fi, blue tooth and mobile connectivity.

**Q.No.29. Write about Smart phone. (B)****(PM, N14RTP)**

- a) A Smart Phone is a mobile phone built on a mobile operating system with more advanced computing capability connectivity than a feature phone.
- b) This handheld device integrates mobile phone capabilities with the more common features of a handheld computer or PDA.
- c) Smartphone allows users to store information, e-mail and install programs.
- d) Modern Smart Phones also include high-resolution touch screens and web browsers for internet browsing.
- e) It also supports Wi-Fi and mobile broadband.

Q.No.30. Write about Touchpad. (B)

(PM, M15RTP, N14 MTP1 - 2M)

- A Touchpad is a pointing device featuring a tactile sensor, a specialized surface that can translate the motion and position of a user's fingers to a relative position on screen.
- Touchpads are common feature of laptop computers.
- These are also used as a substitute for a mouse where desk space is limited.
- These are also used on Personal Digital Assistants (PDAs) and some portable media players.
- Touchpads operate in one of several ways, including capacitive sensing and conductance sensing.

Q.No.31. Write about iPad. (C)

(PM)

- iPad is a line of tablet computers designed and marketed by Apple Inc., which runs Apple's iOS.
- iOS is designed for finger based use. iOS uses less power, and gives better battery life.
- Apple introduced responsive multi touch gestures, like moving two fingers apart to zoom in.
- The iPad has built-in Wi-Fi and cellular connectivity.
- An iPad can shoot video, take photos, play music, and perform Internet functions.

Q.No.32. Write about ipod. (C)

(PM, M16 - 2M)

- The iPod is a line of portable media players designed and marketed by Apple Inc.
- There are four current versions of the iPod: the ultra-compact iPod Shuffle, the compact iPod Nano, the touch screen iPod Touch, and the hard drive-based iPod Classic.
- iPods can serve as external data storage devices.
- Storage capacity varies by model, ranging from 2 GB to 160 GB.



Q.No.33. Write about Ultra - mobile PC (UMPC). (C)

(PM)

- An ultra-mobile PC is a small form factor version of a pen computer.
- UMPCs are smaller than subnotebooks, have a TFT display about 5 to 7 inch screen, are operated like tablet PCs using a touch screen and can also have a physical keyboard.
- The first-generation UMPCs were simple PCs running Linux or an adapted version of Microsoft's tablet PC operating system.



Q.No.34. Write about Android. (A)

(PM, M15 - 2M, M15 MTP2 - 2M)

- Android is a Linux-based operating system designed primarily for touch screen mobile devices such as smart phones and tablet computers.
- Android devices come in all shapes and sizes, with vibrant high-resolution displays and cameras.
- The user interface of Android is based on direct manipulation, using touch such as swiping, tapping, pinching and reverse pinching to manipulate on-screen objects.
- Android is open source software, which allows the software to be freely modified and distributed by device manufacturers, wireless carriers and developers.

**TOPIC 5: NEED FOR INFORMATION TECHNOLOGY****Q.No.35. Why Most of the organisations use Computers and Information Technology? (B)**

Due to the following reasons, today most organizations use computers and technology.

**1. Communication Capabilities:**

- a) IT provides the enterprises with the resources, to communicate quickly and effectively.
- b) With these communication capabilities, enterprises can integrate(=join together) their business functions across different geographical areas.  
*E.g.: Email, video conferencing equipment and internal chat rooms.*
- c) **WhatsApp Messenger** is a cross-platform mobile messaging application which allows us to exchange messages without having to pay for SMS. It is available for: iPhone, BlackBerry, Android, Windows phone, there is no cost to message. **(N15 - 2M)**

**2. Data and Information Management:**

- a) Today, most enterprises store digital versions of documents on servers, storage devices and on cloud systems.
- b) These documents are instantly available to anyone with access rights, regardless of their geographical location.
- c) IT enables Information Security, which encompasses the protection of information from accidental or intentional misuse by persons inside or outside an enterprise.

**3. Automated Processes:**

- a) Business Process Automation (BPA) is a strategy that is used to optimize and streamline the essential business processes, using the latest technology to automate the functions involved in carrying them out. **(M15RTP, M16 MTP2 - 1M)**
- b) *The idea behind BPA is to allow the organizations to extract maximum benefit by using the available resources to their best advantage, while keeping the operational cost as low as possible.*

**SIMILAR QUESTION**

1. List out the reasons why today most of the organizations use computers and technology?

**TOPIC 6: IMPORTANCE OF IT IN AUDITING****Q.No.36. Explain the Importance of IT in Auditing? (C)**

- a) Impact of IT is extensive for enterprises, professionals and individuals. IT encompasses all aspects of functioning of enterprises from strategy to operations, conception to completion and from ideation to value creation.
- b) Accountants and Auditors, in their various roles ranging from accounting to auditing have to use and embrace technology to perform their jobs effectively and efficiently. They deal with data in myriad forms for analysis and decision-making.
- c) Auditors will have to provide assurance on the security, effectiveness, and reliability of information, applications, and new and effective business practices and processes.
- d) As IT increasingly becomes a key enabler in enterprises of all types and sizes there is transformation from 'Technology Oriented' to 'Business and Technology Oriented'.

**SIMILAR QUESTION**

1. Why auditors should have knowledge about IT? Explain?

**Q.No.37. What are The Objectives of Audit? Explain Differences in audit procedures? (B)  
(N15RTP, N15 MTP2 - 4M)**

The objectives of Audit would vary depending on the type, purpose objective and scope of audit. However, the general objectives of auditing in a computerized environment are:

- a) **Existence:** Verify that the assets, liabilities, ownership, and/or activities are real.
- b) **Authorization:** Verify that events have occurred in accordance with management's intent.
- c) **Valuation:** Verify that the accounting values fairly present items worth.
- d) **Cutoff:** Verify that the transaction is recorded in the proper accounting period.
- e) **Compliance:** Verify that the processing is in compliance with government laws and regulations, generally accepted accounting procedures, and the organization's policies and procedures.
- f) **Operational:** Verify that the Program, area, or activity is performed economically efficient, and effectively.
- g) Determining whether efficient use is made of the organization's Computer resources.
- h) Determining whether computer system used accomplishes the business objectives and goals.

**Differences in audit procedures are given as follows:**

- a) **Study Technical Aspects:** *Gather evidential matter related to technical aspects of systems under study, including all relevant documentation describing the computer facility, application Programs, operating procedures, security procedures and so on.*
- b) **Use Unique Techniques:** *Audit in a computerized environment would require application of unique techniques to these efforts. For example, the audit planning step includes review of technical documentation and interviewing technical specialists. The auditor must understand the procedures for testing and evaluating Computer Controls.*
- c) **Audit Software Usage:** *These procedures include the use of generalized audit software to survey the contents of data files, the use of specialized software to assess the contents of operating system parameter files and flow-charting techniques for documenting the automated applications.*

## **TOPIC 7: NEED FOR CONTROLS IN INFORMATION SYSTEMS**

**Q.No.38. Explain the Need for Controls in Information Systems. (B) (M16 - 4M)**

- a) Technology has increased the ability to capture, store, analyse and process tremendous amounts of data and information by empowering the business decision maker.
- b) With the advent of affordable hardware, technology has become a critical component of business.
- c) Today's dynamic global enterprises need information integrity, reliability and validity for timely flow of accurate information throughout the organization.
- d) Safeguarding assets to maintain data integrity to achieve system effectiveness and efficiency is a significant control process.
- e) A well designed information system should have controls built-in for all its sensitive or critical sections.

**IS control procedure may include:**

- |                                                        |                                                        |
|--------------------------------------------------------|--------------------------------------------------------|
| a) Strategy and direction                              | d) System development methodologies and change control |
| b) General Organization and Management                 | e) Operation procedures                                |
| c) Access to IT resources, including data and Programs |                                                        |

- f) System Programming and technical support functions;
- g) Quality Assurance Procedures
- h) Physical Access Controls
- i) Business Continuity Planning (BCP) and Disaster Recovery Planning (DRP)
- j) Network and Communication
- k) Database Administration
- l) Protective and detective mechanisms against internal and external attacks.

**SIMILAR QUESTION**

1. Why should we use controls in information system?
2. Explain importance of controls information system?

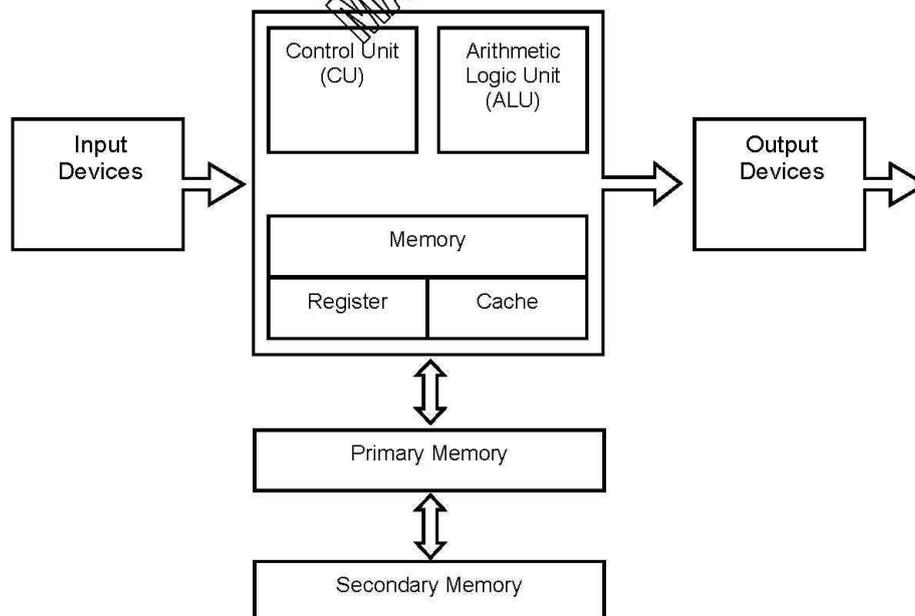
**QUESTIONS FOR ACADEMIC INTEREST**

Q.No.39. What is meant by Hardware? Explain briefly.? (C)

(Student Self - study)

Hardware is the tangible portion of computer systems which a user can touch and see. It basically consists of devices that perform the functions of input, processing, data storage and output activities of the computer.

- a) **Input devices** are devices through which we interact with the systems. Ex: Keyboard, Mouse and other pointing devices.
- b) **The Central Processing Unit** is the actual hardware that interprets and executes the program (software) instructions and coordinates how all the other hardware devices work together
- c) **Data Storage Devices** refers to the memory where data and Programs are stored.
- d) **Output devices** can be used to view the output in Hard copy form and Soft copy form. Various types of Output Devices are: Cathode-Ray Tubes, Liquid Crystal Displays, Plotters, Printers etc.

**SIMILAR QUESTION**

1. Explain components of computer system?

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Q.No.40. Write short notes on input and output devices? (B) (PM)

**Input Devices:**

(N15 RTP, M15 MTP2 - 1M)

- a) Input devices are devices through which we interact with the systems.
- b) They include devices like Keyboard, Mouse.

**Output Devices:**

- a) Computers provide output to decision makers at all levels of an enterprise to solve business problems.
- b) The desired output may be text, graphics or video information.
- c) Printers, plotters can be used to print the output in Hard copy form. Monitors can display output in Softcopy form.

**Several output devices are:**

- a) **Cathode-Ray Tube (CRT):** A vacuum tube that uses an electron gun (cathode) to emit a beam of electrons that illuminate phosphors on a screen as the beam sweeps across the screen repeatedly. A monitor is often called a CRT.
- b) **Liquid Crystal Display (LCDs):** A low-powered display technology used in laptop computers where rod-shape crystal molecules change their orientation when an electrical current flows through them.
- c) **Laser Printer:** A printer that forms images using an electrostatic process, the same way a photocopier works.
- d) **Ink - jet Printer:** A printer that makes images by forcing ink droplets through nozzles.
- e) **Plotter:** A printer that uses computer-directed pens for creating high-quality images, blueprints, schematics, etc.
- f) **Speakers:** Gives an audio output.

Q.No.41. Explain the major objectives of organization and explain the operations performed by DBMS? (C)

- 1. Every organization needs to manage its information in an appropriate and desired manner. It has to do the following for managing it:
  - a) To know the information needs
  - b) Acquiring the needed information
  - c) Organizing the acquired information in a meaningful way
  - d) Assuring information quality
  - e) Providing software tools so that users in the enterprise can access information they require.
- 2. To achieve the above objectives, we use Data Base Management System. The following operations can be performed on files
  - a) Adding new files to database
  - b) Deleting existing files from database
  - c) Inserting data in existing files
  - d) Modifying data in existing files
  - e) Deleting data in existing files
  - f) Retrieving or querying data from existing files.

3. DBMS are software that aid in organizing, controlling and using the data needed by the application program (front end).
4. DBMS provide the facility to create and maintain a well-organized database.
5. Applications access the DBMS, which then accesses the data. Commercially available Data Base Management Systems are Oracle, My SQL, SQL Servers and DB2 etc.

**Q.No.42. Write about computer networks or network links. (C)**

a) Computer Network is a collection of computers and other hardware interconnected by communication channel that allow sharing of resources and exchange of data among different computers.

b) Each component, the computer or a hardware device in a computer network is called a 'Node'.

**Communication can be done through two ways: (N15 MTP2 - 2M)**

a) **Connection Oriented networks:** In this network, a connection is established first and then data is exchanged. Example is telephone networks.

b) **Connectionless Networks:** There is no prior connection is made before data exchanges. Data which is being exchanged from sender to receiver through several ways or several paths instead of a permanent path. Example is Internetworks.

#### **Issues a computer network**

The following four terms can be considered while transferring data from Sender to Receiver.

a) **Routing:** It refers to the process of deciding on how to communicate the data from source to destination in a network.

b) **Bandwidth:** It refers to the amount of data which can be sent across a network in given time.

c) **Resilience:** It refers to the ability of a network to recover from any kind of error like connection failure, loss of data etc. (N15 RTP)

d) **Contention:** It refers to the situation that arises when there is a conflict for some common resource. For example, network contention (conflict) could arise when two or more computer systems try to communicate at the same time. (M16RTP, M15 MTP2 - 1M)

#### **SIMILAR QUESTION:**

1. What is network? Explain issues of a computer network?

**Q.No.43. Write about Machine cycle? Explain the 'computing process' in detail? (B)**

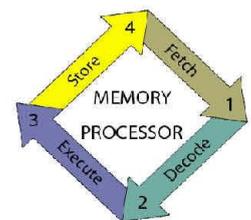
#### **MACHINE CYCLE:**

a) **Instruction Fetch (IF):** Fetch an instruction from the current program, pass it to the next stage.

b) **Instruction Decode (ID):** Instruction would be decoded to figure out what we actually need to do.

c) **Execution (Ex):** Execution unit will then perform some operation like an addition, multiplication or Memory access.

d) **Write Back (WB):** Write the result to another register. So, it is ready to go for the next operation.



The above is the Machine Cycle, Fetch-Decode-Execute-Store which gets executed within CPU.

Fetch and decode are done by Control Unit (CU) whose job is to understand and explain to Arithmetic Logic Unit (ALU). ALU is used to execute and results are stored in Register.

**Computing process:**

- Load:** Load some data from the RAM into a register.
- Store:** Free up a register by storing its data back into RAM.
- Add:** Add two pieces of data together. This could also be other common math operations like subtract, multiply, divide, shift, etc.
- Compare:** Check to see if one piece of data is bigger or smaller than another.
- Branch:** Jump to the new location in the program code and continue executing from there.

**Q.No.44. Write about Laptop or Notebook Computer. (C)**

(PM)

- Laptop is a small, portable computer and small enough that it can sit on a lap.
- Notebook is an extremely light weight personal computer, typically weighs less than 3 Kg and is small enough to fit easily in a briefcase.
- Notebook computers use flat-panel technologies, to produce a light weight and non-bulky display screen.
- Now a days due to reduction in size, weight the difference between Laptop and Notebook has become very thin and computer laptop is more frequently called a notebook computer.

**Q.No.45. What are the activities which are tied up with the BPA application? (B) (PM, N16 RTP)****BPA rests on the following three critical pillars:**

- Integration:** BPA allows applications and operating systems not only to read data that the systems produce, but also to pass data between the component applications of the business process and to modify the data as necessary.
- Orchestration:** The process of orchestration enables the ability to bring tasks that exist across multiple computers and different business departments or branches under one umbrella that is the business process itself.
- Automation:** Orchestration and integration unit with automation to deliver the capability to provide a rules-based process of automatic execution that can span multiple systems and enable a more effective, nimble and efficient business process.

**SIMILAR QUESTION:**

- What are the three critical pillars of Business Process Automation?

**Q.No.46. What type of IT Infrastructure should an organization need for automation? (B)**

(M16 RTP)

The IT Infrastructure an organization should need for automation are:

- Database access and changes:** It provides access to data via ODBC (Open Database Connectivity) connections, data updates, and file transfers.
- File replication and data backup:** It protects valuable data by backing up databases and key systems.
- Systems and event log monitoring:** It reviews and analyzes the event log and critical systems, and create multistep corrective action, such as restarting a server service. With BPA, these processes run automatically when certain events occur.
- Job scheduling:** It automates processes that perform a variety of daily or unscheduled tasks.

- e) **Application integration:** It automates IT and business processes by combining applications that drive business. Complex processes such as database queries, data transformation and spreadsheet integration can be automated.
- f) **File transfers:** It can be automated to deliver and retrieve data on predefined schedules.
- g) **Printing:** It automation to simplify print jobs.

**SIMILAR QUESTION:**

1. From IT perspective, what are the IT Processes that are usually involved in any typical business enterprise?

**Q.No.47. What are Risks and Issues of IT in enterprises? (C)**

- a) Regulations make it mandatory for auditors to review the structure and systems of governance and risk management, which is embedded in IT in most enterprises.
- b) A key requirement of enterprises in IT deployment is to ensure that business objectives are achieved and not mere implementation of latest technology.
- c) A key challenge in implementing IT is: "**Higher the technology, Greater is the need for controls**".
- d) The scope and objective of assurance do not change with technology, but the way controls are reviewed is drastically changed.
- e) Auditors with their in-depth knowledge and core competencies in business process and internal control, are uniquely positioned to provide assurance and consulting services in IT area.
- f) Technology risks are faced by enterprises that are heavily driven by and dependent on technology, especially where the types of technology used are rare and keep changing.
- g) When the technology used fails or becomes obsolete, the enterprise may not be able to continue with its business.

**SIMILAR QUESTION**

1. What are the technology risks in enterprises? Explain?

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**THE END**