# TOPIC 1: INTRODUCTION TO COMPUTING

**Define the term a Computer**

*A Computer is an electronic device which stores and processes data in binary form according to the instructions given to it in available program.*

**OR;**

*A Computer is an automatic machine made up of electronic and electromechanical devices which manipulates and processes data.*

**OR**

*A Computer is an electronic device that accepts data input, processes it acc9ording to some specified instructions, outputs the information and stores the results for future use.*

**Mention four factors one should consider when buying more computers for use.**

- *Higher processing speed of the computers.*
- *Larger hard disk capacity.*
- *Higher storage capacity*
- *High memory/RAM capacity*
- *Processor type objectives*
- *Need of the organization/volume of transaction*
- *The hardware company*
- *The cost of the computers*
- *Nature of the display unit/monitors.*

**Give the difference between Digital and Analog computers**

*Analog computers are those that measure, record or reproduce continuous data/information*
*Where as;*
*Digital computers are those that process, receive, understand data/information in binary digits of zero's and ones*

**OR;**

*Analog computers a4re those that process, receive data, information in form of changing phenomena,*
*Where as:*
*Digital computers generate, store and process data using discrete values (numbers or digits)*

**Give the difference between data and information.**

***Data** is a collection of raw facts/figures entered into a computer, while, **information** is processed data.*

**Give one feature of a good computer.**

- *Speed*
- *Accurate*
- *Storage*
- *Diligence*
- *Artificial intelligence*
- *Automation*

**Briefly, state the major activity carried out during the following stages of information processing.**

**(a). input**
- *Data is entered into a computer.*

**(b). processing**
- *Data is converted into information.*

**(c). Storage.**
- *Data / information is kept in various storage location for future use.*

**(d). output**
- *Information is reproduced or given out to the user.*

**Explain the following attributes of computers which make them dependable and reliable tools.**

- ***Speed:*** *A computer is a very fast device. It can perform in few seconds, the amount of work that a human being can do in an entire year.*
- ***Accuracy:*** *A computer is an accurate machine it can produce work with minimal errors though it bases on principle cabbage in and cabbage out.*
- ***Automatic (Automation):.*** *Computer is automatic machines, because one started on a job, they carry on, until the job is finished, without any human assistance. However, computer being machines cannot start themselves. They cannot go out find their own problems and solutions. They have to be instructed.*
- ***Diligence:*** *this is the ability of a computer to work without getting tired or bored. It can continuously work for hours without creating any error human beings in doing regular types of jobs, which requires great accuracy..*
- ***Versatility:*** *It means the capacity to perform many different types of tasks. A computer is capable of performing almost any task, if the task can be reduced to series of logical steps.*
- *Storage: A computer can store data and information.*
- ***Artificial Intelligence:*** *This is the ability of a computer to think and reason like a human being. The computer is capable of mimicking human behaviours like sensing, responding to the stimuli and others.*
- ***Reliability:****A computer is consistent in all the tasks it does perform. All the output is dependable and results carry meaning.*

**Define the term information processing cycle.**

*Refers to a sequence of events in processing information, which includes input, processing, storage and output. These processes work together and repeat over and over.*

**Brieflyoutline four stages of the information processing cycle**

1. ***Collection of Data*** *-- capturing data from their sources and recording it onto some media (e.g., paper).*

2. ***Preparation of Data*** *-- copying, grouping, or arranging data in a more convenient way for input. Checking and verifying the data collected are often done at this stage.*

3. ***Input of Data*** *-- entering the data or sending the stored data into the processing system. Checking the accuracy and validity of the input data are often done at this stage.*

4. ***Processing of Data*** *-- calculating or manipulating the input data and even storing the results for future use.*

5. ***Output of Information*** *-- giving out the processed results in a readable form (e.g., a report).*

**Differentiate between data validation and dataverification.**

***Data validation:*** *is the process of comparing the data entered with a set of predefined rules or values to check if the data is acceptable* ***While***

***Data verification:*** *is the process of checking for mistakes and inconsistences in the data that has been copied from one place to another to see it still represents the original data.*

**Describeanythree validation techniques.**

- *Presence check*
- *Range check*
- *Data Type check*
- *Consistency check*
- *Control Total check*
- *Hash total check*
- *Check digit*

**7. Explain anyfiveadvantages of using computers**

- *Computers with communicating capability can share data and information with other computers.*
- *Tasks can be completed faster because computers work at amazing speed.*
- *Computers can process large amounts of data and generate error-free results, provided that the data is entered correctly i.e. GIGO.*
- *Computers can store enormous amounts of data for future use.*
- *The high reliability of components inside modern computers enables computers to produce consistent results.*
- *Efficiency and productivity can be raised.*
- *Running cost becomes lower in the long term.*
- *Tasks can be completed with little human intervention (i.e., automatic).*
- *Overall security can be raised due to less human intervention.*
- *Management can observe new information and new trends more quickly.*
- *Customer services can be improved due to efficient management and operations.*

**8. Explain anyfivedisadvantages of using computers.**

- *Initial investment cost can be high (Setting up).*
- *Extra cost is required to employ specialised staff to operate and design the data processing system.*
- *Some jobs may be lost due to computerization and thus lower the morale of staff members.*
- *Some staff has / have to be trained or retrained*
- *Face-to-face interactions among staff may be reduced.*

- *Easier transmission of viruses via the internet, which may lead to creating untimely, costs to the recipient and sender computers.*
- *Abuse: computers load personal information, which may be misused. It is easy to misuse personal information held about an individual but privacy rights have been enacted to minimize this.*
- *Failure: problems may arise when computers cannot be used either because they are malfunctioning or damaged. This can bring an organization to a halt if no backup exists.*
- *Security has to be provided to protect personnel and staff from preying eyes.*

**Describe the term ICTS.**
*Information Communication Technology refers to a set of technological tools, resources which are used to communicate, create, disseminate, store information and manage information*
*OR*
***Information Communication Technology**. This can be defined as the convergence of information technology, telecommunications and data networking technology into a single technology.*

**Explain the ways how ICT has been applied in the following fields.**
**(a)Application of ICT at home.**

- *Pay bills through pay phone services*
- *Computers are used for Budgeting and personal financial management*
- *Buy share stocks online*
- *Manage investments and family bugdets*
- *Computers are used for Entertainment at home*
- *Take college class online*
- *Computers are used to Produce assignments and reports*
- *Access wealth information such as news, stock prices and education matyerials*
- *Online banking*

**(b) Application of ICT in Bank**

- ***Online banking;** transfer money electronically among different accounts.*
- ***Use of magnetic ink character recognition (MICR)** reader can read text printed with magnetized ink*
- ***Load and credit card** applications*
- *Obtain credit card statements, bank statements and account balances using internet banking systems*
- ***Download monthly transaction** information*
- ***Automated teller machine** (ATM); make deposits, withdraw cash and transfer money between accounts.*

**(c)Application of ICT at school**

- ***Computer based training include;** (CBT) that allows students to learn and complete exercises with instructional software*
- ***Computer –assisted instructions** (CAI) so that students can use computers and appropriate software to learn at their own pace.*
- ***Educational software** is designed to teach a particular skill about any subject.*
- *Computer-assisted assessment (CAA) which may reduce the time and the labour tomake the answer scripts*
- ***Distance learning through computer-based training** and web-based training.*
- ***Electronic library system** forsearching, borrowing and returning books.*
- ***The School Administration Management System** (SAMS) for keeping records of students and producing report cards or related documents.*

**(d)Application of IT in office**

- *Computers are used to Create memos, letters and reports*

- *Calculate payroll, prepare income statements and balance sheets*
- *Inventory management systems to Track inventory and generate invoices and receipts*
- *Present projects and ideas by means of presentation graphics software.*
- *Use of electronic-mail, electronic- bulletin and video conferencing.*
- *Use of document processing system to facilitate data entry*
- *Create websites to provide selected information, advertise products and services and conduct e-commerce.*

**(e)Application of IT in entertainment**

- *Play computer games*
- *Listen to music by using computers*
- *Watch video or amovie*
- *Compose and edit a video using a video camera*
- *Retouch a photograph using a computer*
- *Read a book or magazine online*
- *Plan a vacation basing on interne*

**(f) Applications in everyday life include:**

- *Payment by phone services at home.*
- *Payroll system in a factory.*
- *Report card system in a school.*
- *Billing system in the Town Gas Company.*
- *Electronic funds transfer system in a bank.*
- *Mailing list system in a company.*
- *Stock control system in a department store.*
- *Ticket reservation system in a cinema.*
- *Point-of-sale system in a supermarket.*
- *Traffic control system in transportation.*

**(f) Application of ICT in Health.**

- *Computers are used to carry out many surgical procedures such as laparoscopic surgeries*
- *They are used in diagnosis and cure of many disease forexample CT Scan, Ultra sound devices and Magnetic imaging.(IMR)*
- *They enable online consultations by medical professionals.*
- *Use of computer assisted tests can be carried out before prescribing treatment.*
- *They also enable patient's data records to be manageable.*
- *Can be used for research by medical professionals.*
- *Use of computer assisted life saver machine.*
- *Enable faster communication*
- *Can be used to monitor the patients in hospitals e.g CCTVs*

**(g) Security**

- *They are used for fighting crime e. use of digital forensics*
- *Use of Biometric devices such as finger prints.*
- *Computer based face recognition, scene monitoring and analysis.*
- *They are to manage criminal databases in police*
- *Enable research in military and police*
- *They also enable communication between security agencies.*

**Definethe term E-Commerce as used in ICT.**

- *Electronic commerce (e-commerce) is a financial business transaction that occurs over an electronic network, such as the Internet.*

**Stateanyfouradvantagesofelectroniccommerce**

- *Transactions can occur immediately and globally, thus save time for participants on both ends.*
- *Transactions can occur 24 hours per day.*
- *Businesses have access to millions of people with Internet connections.*
- *Businesses have the ability to gather customer information, analyze it, and react if appropriate.*
- *Information can be changed and be available quickly.*
- *Customers can compare prices easily.*
- *Feedback can be immediate.*
- *Manufacturers can buy and sell directly, avoiding the cost of the middleman.*
- *Distribution costs for information is reduced or eliminated*

**Suggest anyfourlimitations of electroniccommerce**

- *It is prone to insecurity for example client-server risk and data transfer , transactions and virus attack.*
- *There is high cost startup e.g connection cost, hardware and software cost and maintenance cost.*
- *Lack of skilled personnel with technical knowledge on E-Commerce*
- *Loss of contact with customers.*
- *Uncertainty and limited information*
- *Limited business processes.*
- *Some people fear to operate in paperless and faceless electronic world.*
- *There no physical contact of products and no customer tests and preferences*

**(d) Explain anythreee-commerce models**

- *Business - to - Business (B2B)*
- *Business - to - Consumer (B2C)*
- *Consumer - to - Consumer (C2C)*
- *Consumer - to - Business (C2B)*
- *Business - to - Government (B2G)*
- *Government - to - Business (G2B)*
- *Government - to - Citizen (G2C)*

**Suggest anythreeadvantages of using ATMs**

- *You don't have to carry cash around with you.*
- *If your card is stolen, the thief cannot get your money without your PIN.*
- *You can use it to pay at some retail shops.*
- *Keeps your money safe.*
- *ATM or Bank Card You can withdraw cash at any time, day or night. The banks don't need to be open.*
- *ATMs offer the convenience of multiple locations. You can withdraw cash at any bank that is part of the system to which your ATM card is linked.*

- *Your ATM card is protected by a PIN, keeping your money safe.*
- *You don't need to fill out withdrawal and deposit slips as is required at the bank.*
- *ATMs are faster than going to the bank—no long lines.*
- *You can withdraw cash at ATMs in foreign countries any time, day or night. The banks don't need to be open.*
- *ATMs offer the convenience of multiple locations. You can withdraw cash at any bank that is part of the system to which your ATM card is linked.*

**Mention anythreeservices offered bythe ATM**.

- *Cash Withdrawal*
- *Balance Enquiry*
- *Statement Enquiry (printing in some cases)*
- *PIN Change*
- *Cash Deposit*
- *Cheque Deposit*
- *Funds Transfer*
- *Credit Card Payment*
- *Utility Bill Payment*
- *Cheque Book Request*
- *Insurance Premium Payment*
- *Mobile, DTH, etc recharges and topups*
- *NGO donations in some cases*
- *Term deposit opening*
- *User details updation*

**Give four disadvantages of using ATM cards**

- *You may forget your PIN number.*
- *Risk of robbery when you leave the ATM.*
- *The ATM can break down or run out of cash.*
- *Fees charged to use ATMs of other banks can become expensive*
- *The system can be off-line.*
- *Training is needed.*
- *Difficult to maintain spending discipline*

**What is a computer model?**

*This refers to the constructing and manipulating abstract (mathematical and/or graphical) representations of economic, engineering, manufacturing, social, and other types of situations and natural phenomenon, simulated with the help of a computer system. Also called computer simulation*

## Whyarecomputermodels used?Give four reasons

- *Make alterations and quickly see the outcomes*
- *Repeat tests several times over*
- *Learn from "what if?" scenarios*
- *Model dangerous situations safely*

## (c) Mention anythree examples of computer modeling

- *Modeling supermarket queues*
- *Modeling the stresses which will be borne by a new bridge*

- *Modeling traffic flow in a new road system*
- *Flight simulators to help train aircraft pilots*
- *3D models of buildings and products to simulate how designs will look when built*
- *Spreadsheet models to simulate profit/loss based on different levels of income*

**What is an expert system?**

*An expert system is a computer program that is designed to emulate and mimic human intelligence, skills or behavior. It is mainly developed using artificial intelligence concepts, tools and technologies, and possesses expert knowledge in a particular field, topic or skill.*

**Where are expert systems used?Give anyfourareas.**

- *Expert advice available all the time*
- *Knowledge of expert staff can be captured to some extent before they move on.*
- *Can be used as a training aid to increase the expertise of staff*
- *Makes rational decisions without any emotional overhead*
- *Does not get tired or overworked.*
- *Efficient way of getting answers as it does not involve additional help staff e.g. automated help systems*
- *Natural language interface would make the expert system more human friendly*

**Mention anythreelimitations of expert systems**

- *Usually only covers a narrow range of knowledge*
- *A lot of effort and cost has to go into making a good expert system*
- *Not as good as having human experts to hand.*
- *Most expert systems are menu driven which does not deal very well with ambiguous problems.*
- *Advanced interfaces such as natural language processing still has some way to go before they are truly effective.*
- *Does not learn from mistakes unless user feedback and human maintenance is part of its ongoing development.*
- *Unlikely to come up with creative solutions.*

**Suggest anyfour tasks handled byrobots in an industrial plant.**

- *Assembling of products*
- *Handling dangerous material*
- *Spraying fumes*
- *Inspecting parts*
- *Cutting and polishing of products*
- *Welding of metals*
- *Labeling of finished products*
- *Packing of products into containers*
- *Filling and toppling of bottles*

**Whyuse computercontrolled robots?Outline anyfourreasons**

- *Can operate 24 hours a day without taking a break.*
- *Can work without holidays or sick days*
- *Will work without any wages.*
- *Will accurately repeat actions over and over again*
- *Can process data from sensors very quickly*
- *Can take account of hundreds of inputs at the same time*
- *Can be used in dangerous or awkward environments.*

**Mention anyfourlimitations of industrial robots**

- *They are not creative and innovative*
- *They cannot think independently*
- *They cannot complicated decisions*
- *They cannot learn from mistakes*
- *They cannot quickly adapt to new changes in their surroundings*

**Explain anyfiveadvantages of usingICTs**

- ***Enhancement of efficiency****- ICT has brought the ability among workers to produce good results by using the available time, money, supplies etc in most effective manner.*
- ***Communication****. This has been enhanced by the development in the communication industry e.gE-mail, Skype,Facebook etc.*
- ***Networking.*** *This is basically use of computer and other resources thus eliminating duplication of data and other resources in the organization*
- ***Security.****Computers have generally improved security through computer development of security conscious gadgets like automated gates CCTV cameras.*
- ***Service delivery.*** *It has stimulated a sustainable flow of information and interlinking the various stakeholder within the various business.*
- ***Entertainment.****For example playing computerized music, games, computer games etc.*
- ***Enhancement of employment opportunities****e.g computer teachers, software engineer'setcwhich has created employment opportunities.*
- ***ICT explore and facilitates scientific research****e.g solving the problem of physics and engineering design,explore relations of biological and physiological processes.*

**Explain anyfivedisadvantages of usingICTs.**

- ***Health problem.*** *Computers have affected health standards of human life for stance light from the screen affect eyes, sitting down causes back pain etc.*
- ***Fraud.*** *This is where one commits unacceptable activity as the way of getting organization's information or data without permission from the owner. E.g stealing money from one account to another in the Bank.*
- ***Moral degeneration.*** *through the pornographic literature, message clips etc which have led to loss of cultural values*
- ***Cost of production.*** *This is because compute3ers are expensive to buy and maintain hence increased prices.*
- ***Unemployment****. It has negatively affected the society by replacing the workers with no computer skills.*
- ***Computer viruses.*** *These are considered the greatest nightmare because they attack once the computer system and destroy it with in a minute leading to loss of information.*
- ***Death and accidents.*** *They cause death and accidents due to computer explosions*

- ***Over reliance on computer.*** *This has come up due to over dependence on computer making them do everything hence causing mental decadence.*

**Explain anythree healthproblems associated withuse ofICTs**

- *Stress;*
- *Eyestrain;*
- *Wrist injuries;*
- *Neck and back problems.*