MARKING GUIDE

**TOTAL MARKS (20marks)**

**BASIC COMPUTING TEST. 1 hour**

1.(a) Define a computer.(1 mark)

A computer is a machine that can be programmed to automatically carry out sequences of arithmetic or logical operations. Modern digital electronic computers can perform generic sets of operations known as programs.

A computer is an electronic device that can process, store, and retrieve data according to a set of instructions called a program. It performs a variety of tasks by executing arithmetic and logical operations, enabling users to carry out functions like calculations, data management, communication, and multimedia processing. Computers come in various forms, including desktops, laptops, tablets, and servers, and they are essential tools in modern society for both personal and professional use.

(b).Differentiate between data and information.(1 mark)

Data comprises raw, unprocessed facts that need context to become useful, while information is data that has been processed, organized, and interpreted to add meaning and value. Sure! Here’s a differentiation between data and information:

### Data:

- \*\*Definition\*\*: Raw facts and figures without context. Data can be in the form of numbers, text, images, or sounds.

- \*\*Nature\*\*: Unprocessed and unorganized. For example, a list of numbers or dates.

- \*\*Examples\*\*: 25, "apple," 2024, 98.6°F.

- \*\*Usage\*\*: Data serves as the basic input that, when processed, can lead to meaningful insights.

### Information:

- \*\*Definition\*\*: Processed data that has been organized or structured to provide meaning or context. It is data that has been interpreted and made useful.

- \*\*Nature\*\*: Meaningful and contextual. For example, “The average temperature is 98.6°F, which is normal for a healthy adult.”

- \*\*Examples\*\*: A report summarizing sales data, a graph showing temperature trends, or a news article.

- \*\*Usage\*\*: Information is what we use to make decisions, draw conclusions, and understand the world around us.

In summary, data is the raw material, while information is the result of processing that data into a format that is understandable and useful.

(c).Distinguish between the different computer types in terms of cost, capacity, speed and typical users.(3 marks)

2.What is a computer network and list the major types of computer networks?(2 marks)

Here’s a comparison of different types of computers based on cost, capacity, speed, and typical users:

### 1. \*\*Personal Computers (PCs)\*\*

- \*\*Cost\*\*: Generally affordable, ranging from a few hundred to a couple of thousand dollars.

- \*\*Capacity\*\*: Suitable for individual tasks; storage ranges from 256 GB to several TB.

- \*\*Speed\*\*: Moderate speed, typically sufficient for everyday tasks like web browsing, word processing, and light gaming.

- \*\*Typical Users\*\*: Home users, students, and small businesses.

### 2. \*\*Laptops\*\*

- \*\*Cost\*\*: Varies widely; generally comparable to desktops but can be more expensive for portability (starting from a few hundred to several thousand dollars).

- \*\*Capacity\*\*: Similar to PCs, with storage options from 256 GB to several TB; portable, with a focus on battery life.

- \*\*Speed\*\*: Similar performance to desktop PCs, though high-end gaming laptops can be significantly faster.

- \*\*Typical Users\*\*: Students, professionals, travelers, and remote workers.

### 3. \*\*Servers\*\*

- \*\*Cost\*\*: Higher cost, often ranging from several thousand to tens of thousands of dollars depending on specifications.

- \*\*Capacity\*\*: High storage capacity, often in the range of multiple TBs or more, designed to manage large amounts of data and simultaneous requests.

- \*\*Speed\*\*: High-speed processing power, optimized for handling multiple tasks and users simultaneously.

- \*\*Typical Users\*\*: Businesses, data centers, and organizations requiring reliable data storage and management.

### 4. \*\*Supercomputers\*\*

- \*\*Cost\*\*: Extremely high, often millions to billions of dollars.

- \*\*Capacity\*\*: Exceptional storage and processing capabilities, capable of handling petabytes of data.

- \*\*Speed\*\*: The fastest computers available, performing billions of calculations per second.

- \*\*Typical Users\*\*: Research institutions, government agencies, and industries needing complex simulations (e.g., climate modeling, scientific research).

### 5. \*\*Embedded Systems\*\*

- \*\*Cost\*\*: Generally low, often just a few dollars to a few hundred dollars.

- \*\*Capacity\*\*: Limited storage and processing power, tailored for specific tasks (e.g., sensors, appliances).

- \*\*Speed\*\*: Varies widely based on application; typically optimized for the specific function.

- \*\*Typical Users\*\*: Manufacturers, engineers, and developers creating specific applications in appliances, automotive, and electronics.

This comparison highlights the diversity among computer types and their suitability for different users and purposes.

(c).What is a network topology and list down the different topologies you know.(3 marks)

It defines how these components are connected and interact with each other. Understanding various types of network topologies helps in designing efficient and robust networks. Common types include bus, star, ring, mesh, and tree topologies, each with its own advantages and disadvantages.

3. What is meant by the following terms as used in internet and WWW? (5 marks )

a) Web browser: A **web browser** takes you anywhere on the internet, letting you see text, images and video from anywhere in the world. A web browser is a software application that lets you access and view websites on the internet.

b) URL: A URL (Uniform Resource Locator) is the address of a unique resource on the internet. It is one of the key mechanisms used by browsers to retrieve published resources, such as HTML pages, CSS documents, images, and so on. In theory, each valid URL points to a unique resource.

c) Website: a set of related web pages located under a single domain name, typically produced by a single person or organization. A website is one or more web pages and related content that is identified by a common domain name and published on at least one web server. Websites are typically dedicated to a particular topic or purpose, such as news, education, commerce, entertainment, or social media

d) Webpage : A web page (or webpage) is a document on the Web that is accessed in a web browser. A website typically consists of many web pages linked together under a common domain name. The term "web page" is thus a metaphor of paper pages bound together into a book.

e) Search Engine: A search engine is a software system that provides hyperlinks to web pages and other relevant information on the Web in response to a user's query. The user inputs a query within a web browser or a mobile app, and the search results are often a list of hyperlinks, accompanied by textual summaries and images.

4.Discuss the different computer generations a computer has gone through since it was invented to the present..5 marks)

The generations of computers are typically divided into five distinct phases: First Generation (1940-1956): Vacuum Tubes. Second Generation (1956-1963): Transistors. Third Generation (1964-1971): Integrated Circuits. Fourth Generation (1971-Present): Microprocessors.

The evolution of computers is categorized into five generations, each defined by significant technological advancements. Here’s an overview of each generation:

### 1. \*\*First Generation (1940-1956)\*\*

- \*\*Technology\*\*: Vacuum tubes

- \*\*Characteristics\*\*: Large, expensive, and consumed a lot of power. Used for basic calculations and data processing.

- \*\*Examples\*\*: ENIAC, UNIVAC.

- \*\*Users\*\*: Mainly used by governments and large organizations for complex calculations.

### 2. \*\*Second Generation (1956-1963)\*\*

- \*\*Technology\*\*: Transistors

- \*\*Characteristics\*\*: Smaller, faster, more reliable, and energy-efficient than vacuum tubes. Introduced high-level programming languages like COBOL and FORTRAN.

- \*\*Examples\*\*: IBM 7094, DEC PDP-8.

- \*\*Users\*\*: Expanded to businesses and universities for various applications, including scientific research and commercial data processing.

### 3. \*\*Third Generation (1964-1971)\*\*

- \*\*Technology\*\*: Integrated Circuits (ICs)

- \*\*Characteristics\*\*: Even smaller and more powerful due to miniaturization of components. Improved performance and efficiency, with more complex software capabilities.

- \*\*Examples\*\*: IBM System/360, PDP-11.

- \*\*Users\*\*: More accessible to medium-sized businesses and institutions, facilitating the rise of business applications.

### 4. \*\*Fourth Generation (1971-Present)\*\*

- \*\*Technology\*\*: Microprocessors

- \*\*Characteristics\*\*: Entire CPU on a single chip, leading to personal computers. Development of graphical user interfaces (GUIs) and more user-friendly software.

- \*\*Examples\*\*: Intel 4004, Apple Macintosh, IBM PC.

- \*\*Users\*\*: Became ubiquitous in homes, schools, and offices, enabling a wide range of applications from gaming to productivity software.

### 5. \*\*Fifth Generation (Present and Beyond)\*\*

- \*\*Technology\*\*: Artificial Intelligence (AI) and Quantum Computing

- \*\*Characteristics\*\*: Focus on AI, machine learning, and advanced parallel processing. Emphasis on natural language processing, neural networks, and quantum computing capabilities.

- \*\*Examples\*\*: AI systems like IBM Watson, quantum computers like Google’s Sycamore.

- \*\*Users\*\*: Researchers, businesses, and tech enthusiasts leveraging AI for data analysis, automation, and complex problem-solving.

### Summary

Each generation of computers has brought about significant advancements in technology, size, speed, and usability, making computers an integral part of everyday life and various industries. The transition from vacuum tubes to microprocessors and now to AI represents a profound transformation in computing power and capability.