Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2021-22** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Introduction to Computer** - What is computer? - Software and hardware - Program - Data and its type - Data Processing - Information **Evolution of Computers and Generation of computers** - Abacus - Pascaline - Difference Engine - Punched card equipment - ABC - UNIVAC – I	Lecture No- **01** Week No- **01** **Essential Prerequisites**- - Basic ideas of computer - Types of Computer and functions - What is CPU? - Uses of Computer

Intended Learning Outcome expected- After the completion of this topic, students will be able to

- Define computer
- Its types and functions
- What is program?
- Differentiate Data and information.
- Differentiate Hardware and software

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask students to What is computer & their types.
- Ask students use of computer.
- Ask students advantage & disadvantage of computer.

DEFINITION:

A computer along with additional hardware and software together is called a computer system. A computer system primarily comprises a central processing unit (CPU), memory, input/output devices and storage devices. All these components function together as a single unit to deliver the desired output.

Reason behind use computer

Computers increase your productivity and, with a good understanding of the software running on them, you become more productive at everything you do. For example, once you have a basic understanding of using a word processor, you can create, store, edit, share, and print documents and letters.

Characteristics of computer
- Speed. A computer works with much higher speed and accuracy compared to humans while performing mathematical calculations.
- Accuracy. Computers perform calculations with 100% accuracy.
- Diligence.
- Versatility.
- Reliability.
- Memory.

Reason behind Evolution :

Each level of a system evolution is built on the previous, so that social computing emerges from personal computing, personal computing emerges from software, and software emerges from hardware. As computing evolves to higher system levels, so its design also changes, from technical to socio-technical design.

Evolution of computer

The abacus was first computing machine developed in 300BC. In 1822 Charles Babbage designed a steam driven calculating machine that laid the foundation of first computer. During 2nd world war first electronic computer ENIAC was developed by john Mauchly and Presper Eckart. In 1946, they developed commercial computer UNIVAC. Originally, their size was like a room and they consumed huge amount of electricity and produced heat. They were very different than modern computers. Modern computers are million times more capable than these early machines and occupy less space.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2021-22**	Lecture No- **02** Week No- **01**

Course Name-Computer Application
Course Code-Th 1b
Periods/week-05
Duration of period - **55mins**
Topic- **Generation of computers**
  • Generations of Computer
	Essential Prerequisites-
	  • First Generation – Vacuum Tubes (1940 – 1956)
	  • Second Generation – Transistors (1956 – 1963)
	  • Third Generation – Integrated Circuits (1964 – 1971)
	  • Fourth Generation – Microprocessors (1972 – 2010)
	  • Fifth Generation – Artificial Intelligence (2010 Onwards)

	• Advantages and disadvantages of generation of computers.

Intended Learning Outcome expected- After the completion of this topic, students will be able to

- Explain the history of computers
- Explain how and why inventions can change the way we live.
- Advantages of First-Generation Computer.
- Explain the key features of computers of each generation?

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask students to Evolution of computer & their types.
- Ask students about Evolution year.
- Ask about different between all evolution.

DEFINITION:

The first generation of computers took place from 1940 to 1956 and was extremely large in size. The inner workings of the computers at that time were unsophisticated. These early machines required magnetic drums for memory and vacuum tubes that worked as switches and amplifiers.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg.
Semester-1ˢᵗ & 2nd
Session- **2022-23**
Course Name-Computer Application
Course Code-Th 1b
Periods/week-05
Duration of period - **55mins**
Topic- **Classification of Computer**
   • Analog Computer
   • Digital Computer
   • Hybrid Computer.
	Lecture No- **03**
	Week No- **01**

	Essential Prerequisites-
	   • Basic idea of Analog, Digital and Hybrid computers
	   • Its Applications and Specification

Intended Learning Outcome expected- After the completion of this topic, students will be able to

- types of computers on basis of sizes
- What are Mainframe and super computers?
- Classify types of Computers

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask students about Computer classification.
- Ask students about method of Computer classification

DEFINITION: -

Generations of computers have seen changes based on evolving technologies. With each new generation, computer circuitry, size, and parts have been miniaturized, the processing and speed doubled, memory got larger, and usability and reliability improved. Note that the timeline specified for each generation is tentative and not definite. The generations are actually based on evolving chip technology rather than any particular time frame.

Reason behind classification: -

Computers differ based on their data processing abilities. They are classified according to purpose, data handling and functionality. According to purpose, computers are either general purpose or specific purpose. General purpose computers are designed to perform a range of tasks.

Classification of computer: -

Sr. No.	Type	Specifications
1	PC (Personal Computer) or Micro-Computers	It is a single user computer system having a moderately powerful microprocessor. It is termed as a computer that is equipped microprocessor as its CPU.
2	Workstation	It is also a single user computer system, similar to the personal computer, however, has a more powerful microprocessor.
3	Mini-Computer	It is a multi-user computer system, capable of supporting hundreds of users simultaneously.

4	Main Frame	It is a multi-user computer system, capable of supporting hundreds of users simultaneously. Software technology is different from minicomputer.
5	Super-Computer	It is an extremely fast computer, which can execute hundreds of millions of instructions per second.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2022-23**	Lecture No- **04** Week No- **01**
Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Basic Organization of Computer (Functional Block diagram)** • Input Devices, CPU and Output devices • Arithmetic and Control Unit • CPU, Caches, Main Memory	**Essential Prerequisites**- • Primary Storage and Secondary Storage • ALU and CU • Input and Output devices • Information Processing Cycle •

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- What is CPU?
- What is ALU?
- Three Input devices used in CPU.
- Differentiate between RAM and ROM.

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask Students to parts of computers
- Function of computer parts
- Ask Student to How to Assemble all the Hardware Parts.
- Ask Student to How to Installation of Computer System.

DEFINITION:

The main component of basic organization of a computer system is micro-processor (C.P.U), memory unit (MU), and input-output devices. Central processing unit: CPU is a brain of computer. It controls the computer system. It converts data to information.

Organisation of Computer: -

- The I/O devices and the CPU both execute concurrently. Some of the processes are scheduled for the CPU and at the same time, some are undergoing input/output operations.
- There are multiple device controllers, each in charge of a particular device such as keyboard, mouse, printer etc.
- There is buffer available for each of the devices. The input and output data can be stored in these buffers.
- The data is moved from memory to the respective device buffers by the CPU for I/O operations and then this data is moved back from the buffers to memory.
- The device controllers use an interrupt to inform the CPU that I/O operation is completed.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg.
Semester-1ˢᵗ & 2nd
Session- **2022-23**
Course Name-Computer Application
Course Code-Th 1b
Periods/week-05
Duration of period - **55mins**
Topic- **Computer Memory and Classification of Memory**
 	
    • CPU, Caches, Main Memory
    • Types of Computer Memory
    • Memory hierarchy
	Lecture No- **05**
	Week No- **02**
	
	Essential Prerequisites-
	    • Computer memory and classification of memory
	    • Primary and Secondary and Secondary memory
	    • Characteristics of Secondary memory

Intended Learning Outcome expected- After the completion of this topic, students will be able to
    • Differentiate between RAM and ROM.
    • What is computer memory?
    • Types of RAM
    • Types of ROM	

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask students about Memory.
- Ask students about Types of memory.
- Ask students about How memory works.

DEFINITION:

Computer memory is any physical device, used to store data, information or instruction temporarily or permanently. It is the collection of storage units that stores binary information in the form of bits. The memory block is split into a small number of components, called cells. Each cell has a unique address to store the data in memory, ranging from zero to memory size minus one. For example, if the size of computer memory is 64k words, the memory units have 64 * 1024 = 65536 locations or cells. The address of the memory's cells varies from 0 to 65535.

classification of Memory:-

Main memory can be generally classified into random-access memory (RAM) and read-only memory (ROM). It is a volatile memory. Due to the absence of power, the content of this memory will be lost. Secondary Memory– Secondary memory is also frequently known as auxiliary memory.

Types of Memory:-

Primary or Main Memory

Primary memory is also known as the computer system's main memory that communicates directly within the CPU, Auxiliary memory and the Cache memory. Main memory is used to kept programs or data when the processor is active to use them. When a program or data is activated to execute, the processor first loads instructions or programs from secondary memory into main memory, and then the processor starts execution.

Accessing or executing of data from primary memory is faster because it has a cache or register memory that provides faster response, and it is located closer to the CPU. The primary memory is volatile, which means the data in memory can be lost if it is not saved when a power failure occurs. It is costlier than secondary memory, and the main memory capacity is limited as compared to secondary memory.

Secondary Memory

Secondary memory is a permanent storage space to hold a large amount of data. Secondary memory is also known as external memory that representing the various storage media (hard drives, USB, CDs, flash drives and DVDs) on which the computer data and program can be saved on a long-term basis. However, it is cheaper and slower than the main memory. Unlike primary memory, secondary memory cannot be accessed directly by the CPU. Instead of that, secondary memory data is first loaded into the RAM (Random Access Memory) and then sent to the processor to read and update the data. Secondary memory devices also include magnetic disks like hard disk and floppy disks, an optical disk such as CDs and CDROMs, and magnetic tapes.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2022-23**	Lecture No- **06** Week No- **02**

Course Name-Computer Application
Course Code-Th 1b
Periods/week-05
Duration of period - **55mins**
Topic- **Software concept, System Software and Application Software**
    • System Software and its type
    • Functions of System Software
    • Application Software
	Essential Prerequisites-
	    • Software and its types
	    • Work of software
	    • Difference between System and Application software

Intended Learning Outcome expected- After the completion of this topic, students will be able to
    • What is software?
    • What is System Software?
    • Mention different types of Software
    • Define Software Concept	

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Software concept
- Ask students about Computers Software.
- Ask about Application Software of computer.

DEFINITION:

Computer software is a set of instructions, data or programs used to operate computers and execute specific tasks. It is the opposite of hardware, which describes the physical aspects of a computer. Software is a generic term used to refer to applications, scripts and programs that run on a device.

How Software is works:

This involves passing instructions from the application software, through the system software, to the hardware which ultimately receives the instruction as machine code. Each instruction causes the computer to carry out an operation—moving data, carrying out a computation, or altering the control flow of instructions.

Main characteristics of computer software include:

- Functionality

- Usability (User-friendly)

- Maintainability
- Flexibility
- Portability

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2022-23**	Lecture No- **07** Week No- **02**

Course Name-Computer Application
Course Code-Th 1b
Periods/week-05
Duration of period - **55mins**
Topic- **Overview of Operating System**
    • Overview of Operating System
    • Types of Operating System
    • Objective and Functions of OS
	Essential Prerequisites-
	    • Basic Idea about Operating System
	    • Basic Idea about Functions of OS

Intended Learning Outcome expected- After the completion of this topic, students will be able to	
	• What is Operating System? • Overview of OS • Services Provided by OS

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask students what is Operating System
- Introduction of Operating System

DEFINITION:

An operating system is a software program required to manage and operate a computing device like smartphones, tablets, computers, supercomputers, web servers, cars, network towers, smart watches, etc. It is the operating system that eliminates the need-to-know coding language to interact with computing devices.

Evolution of OS:

Operating system evolution the first computers used batch operating systems, in which the computer ran batches of jobs without stop. Programs were punched into cards that were usually copied to tape for processing. When the computer finished one job, it would immediately start the next one on the tape.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2022-23**	Lecture No- **08** Week No- **02**

Course Name-Computer Application
 Course Code-Th 1b
 Periods/week-05
 Duration of period - **55mins**
 Topic- **Types of Operating System: Batch Processing, Multiprogramming and Time-Sharing OS**
 Basic concept of:
   1. Batch Processing
   2. Multiprogramming
   3. Time Sharing OS
	Essential Prerequisites-
	 • Basic idea of Batch Processing
	 • Basic idea of Multiprogramming
	 • Basic idea of Time-Sharing OS

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Define Batch Processing   - Difference between Multiprogramming and Time-Sharing OS   - What is Multiprogramming

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Basic idea about Operating System.
- Ask students about Batch Processing, Multiprogramming
- Introduction of Operating System and types of OS.

DEFINITION:-

Batch Operating system is one of the important types of operating system. The users who using a batch operating system do not interact with the computer directly. Each user prepares its job on an off-line device like punch cards and submits it to the computer operator.

Some features of OS:

- Batch Processing. This is the process of collecting programs and data together in a batch before execution or processing.
- Multitasking. The CPU can execute multiple tasks simultaneously by switching among them.
- Multiprogramming.
- Distributive Environment.
- Interactivity.
- Real-Time System.
- Spooling.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg.
Semester-1st & 2nd
Session- **2022-23**
Course Name-Computer Application
Course Code-Th 1b
Periods/week-05
Duration of period - **55mins**
Topic- **Features Of DOS, Windows and UNIX**
    • Features of DOS
    • Heart of MS-DOS
    • Different Versions of Windows
    • UNIX Operating System
	Lecture No- **09**
	Week No- **03**

	Essential Prerequisites-
	    • Basic knowledge about MS DOS
	    • Basic idea of different versions of windows
	    • Three parts of UNIX Operating System

Intended Learning Outcome expected- After the completion of this topic, students will be able to

- What is Kernel?
- What are the versions of UNIX?
- Features of DOS

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Basic idea about DOS.
- Ask students about Windows and Unix.

DEFINITION:-

DOS is a single-tasking, single-user operating system with a command-line interface. DOS acts on commands. Because DOS is ready to perform when given proper command hence, it is also known as Command Prompt. Commands are certain words of English language or short form of English words.

Some features of DOS:

- It is a single user system.
- It controls program.
- It is machine independence.
- It manages (computer) files.

Evolution of DOS:-

DOS primarily consists of Microsoft's MS-DOS and a rebranded version under the name IBM PC DOS, both of which were introduced in 1981. Later compatible systems from other manufacturers include DR DOS (1988), ROM-DOS (1989), PTS-DOS (1993), and Free DOS (1998).

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	

Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg.
Semester-1ˢᵗ & 2nd
Session- **2022-23**
Course Name-Computer Application
Course Code-Th 1b
Periods/week-05
Duration of period - **55mins**
Topic- **Programming Languages, Complier, Interpreter, Computer Virus**
    • Types of Programming languages
    • Compiler
    • Interpreter
	Lecture No- **10**
	Week No- **03**

	Essential Prerequisites-
	    • Basic knowledge of Programming Languages
	    • Work of Compiler
	    • Work of Interpreter
	    • Basic idea about computer virus

Intended Learning Outcome expected- After the completion of this topic, students will be able to

- What is the work of the interpreter?
- Define Compiler.
- Different types of programming languages
- Difference between Compiler and interpreter

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask Students about Programing language
- Introduction of Programming language Compiler

DEFINITION:

A compiler is a special program that processes statements written in a particular programming language and turns them into machine language or "code" that a computer's processor uses. Typically, a programmer writes language statements in a language such as Pascal or C one line at a time using an editor.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	

References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2022-23** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Different Types of Computer Virus** **Detection and prevention of Virus** • Types of Viruses • Detection and Prevention of Virus	Lecture No- **11** Week No- **03**
	Essential Prerequisites- • Basic knowledge about different virus • How a virus can be detected • Anti-virus

Intended Learning Outcome expected- After the completion of this topic, students will be able to
• What is a computer virus? • Explain its types • Identify the virus and measures to prevent it.

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

• Discuss about Computer Virus
• Ask students about Computer Virus

DEFINITION:

A computer virus is a type of malicious software, or malware, that spreads between computers and causes damage to data and software. Computer viruses aim to disrupt systems, cause major operational issues, and result in data loss and leakage.

Signs of a computer virus

• Frequent pop-up windows
• Changes to your homepage
• Mass email being sent from your email account

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2022-23** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Application of computers in different Domain** • Uses of computer	Lecture No- **12** Week No- **03**

	Essential Prerequisites-
	     • Basic knowledge about use of computer:
	     • 1. Home – computer games, entertainment, social media & chatting
	     • 2. Education – Distance Learning, online Exam
	     • 3. Business – marketing, Stock Exchange
	     • 4. Medical – Patient History, Diagnosis purpose

Intended Learning Outcome expected- After the completion of this topic, students will be able to

- Use of computer in our daily life.
- Use and benefit of computers in different domain.

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask students about Domain.
- Introduction Application of computer in different Domain.

DEFINITION:

The definition of a domain is the area a given person or people rules or an area of knowledge. An example of domain is the kingdom ruled by a king. An example of domain is a person's area of expertise, such as mathematics noun.

Uses of Computer at Home:

Computer can be used at home in the following ways

- Home Budget
- Computer Games
- Working from Home

Uses of Computers in Education:

- Computer Aided Learning (CAL)
- Online Examination
- Distance Learning

Uses of Computers in Business:

- Marketing
- Stock Exchange

Uses of computers in Medical Field:

- Hospital Management System
- Diagnosis Purpose
- Patients Monitoring

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Network concept, Protocol, Connecting media** • Introduction to Network • Protocol • Wired media & Wireless media	Lecture No- **13** Week No- **04** **Essential Prerequisites**- • Basic idea about Network • Know about different protocol • Types of connecting media

Intended Learning Outcome expected- After the completion of this topic, students will be able to
    • Define Network & internet
    • Know about connecting medias	

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Draw a picture of computer and ask students to identify different parts of it.
- Ask students about various places where they have seen computers.
- Ask about different applications of computer.

DEFINITION:

The concept of networking is wide but we can define it as the interconnection of two or more networks in different places. Computer Network. In the simplest sense, networking means connecting computers so that they can share files, printers, applications, and other computer-related resources.

Types of networks:
- A computer network is mainly of four types:
- LAN (Local Area Network)
- PAN (Personal Area Network)
- MAN (Metropolitan Area Network)
- WAN (Wide Area Network)

Protocol:

A network protocol is an established set of rules that determine how data is transmitted between different devices in the same network. Essentially, it allows connected devices to communicate with each other, regardless of any differences in their internal processes, structure or design.

Connecting media:

Network media refers to the communication channels used to interconnect nodes on a computer network. Typical examples of network media include copper coaxial cable, copper twisted pair cables and optical fiber cables used in wired networks, and radio waves used in wireless data communications networks.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-07 Duration of period-**55mins** Topic- **COMPUTER TRANSMISION MODE** • Simplex • Half-Duplex • Full Duplex • Synchronous • Asynchronous	Lecture No-**14** Week No- **04** **Essential Prerequisites**- • Basic idea about Transmission mode • Define all types of transmission mode
Intended Learning Outcome expected- After the completion of this topic, students will be able to • Define Transmission mode • How data transfer	
Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

DEFINITION:

Data Transmission mode defines the direction of the flow of information between two communication devices. It is also called Data Communication or Directional Mode. It specifies the direction of the flow of information from

one place to another in a computer network. The data transmission modes can be characterized in the following three types based on the direction of exchange of information:

- Simplex

- Half-Duplex

- Full Duplex

Synchronous transmission mode:

Synchronous transmission is a data transfer method which is characterized by a continuous stream of data in the form of signals which are accompanied by regular timing signals which are generated by some external clocking mechanism meant to ensure that both the sender and receiver are synchronized with each other.

Asynchronous transmission mode:

Asynchronous transfer mode (ATM) is a switching technique used by telecommunication networks that uses asynchronous time-division multiplexing to encode data into small, fixed-sized cells. This is different from Ethernet or internet, which use variable packet sizes for data or frames.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil Engg. Semester-1st & 2nd Session- **2020-21**	Lecture No-**15** Week No- **04**
Course Name-Computer Application Course Code-Th 1b Periods/week-08 Duration of period- **55mins** Topic- **NETWORK TOPOLOGIES** • Bus Topologies • Tree Topologies • Star Topologies • Mesh Topologies • Hybrid Topologies • Ring Topologies	**Essential Prerequisites-** • Know about all Topologies • Work of Topologies

Intended Learning Outcome expected - After the completion of this topic, students will be able to

- Connecting Media
- Network Topologies & Devices
- Internet Connectivity & Services

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Basic idea about Computer topologies.
- Ask students Computer Topologies.

DEFINITION: -

A Network Topology is the arrangement with which computer systems or network devices are connected to each other. Topologies may define both physical and logical aspect of the network. Both logical and physical topologies could be same or different in a same network.

- BUS TOPOLOGIES
- TREE TOPOLOGIES
- STAR TOPOLOGIES
- MESH TOPOLOGIES
- HYBRID TOPOLOGIES
- RING TOPOLOGIES

Evolution of Network: -

In the Internet, Autonomous Systems (ASes) exchange traffic through interconnected links. As traffic demand increases, more traffic becomes concentrated on such links. The traffic concentrations depend heavily on the global structure of the Internet topology. Therefore, a topological evolution considering the global structure is necessary to continually accommodate future traffic amount. In this paper, we first develop a method to identify the hierarchical nature of traffic aggregation on the Internet topology and use this method to discuss the long-term changes in traffic flow. Our basic approach is to extract the "flow hierarchy,"

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period-**55mins** Topic: TYPE OF NETWORK • **PAN** • **LAN** • **MAN** • **WAN**	Lecture No- **16** Week No- **04**
	Essential Prerequisites- • Know about Networking

Intended Learning Outcome expected- After the completion of this topic, students will be able to
• Personal Area Network (PAN) • Local Area Network (LAN) • Wide Area Network (WAN) • Metropolitan Area Network (MAN)

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

DEFINITION:

A computer network is a cluster of computers over a shared communication path that works for the purpose of sharing resources from one computer to another, provided by or located on the network nodes.

1. Personal Area Network (PAN)
2. Local Area Network (LAN)
3. Wide Area Network (WAN)
4. Metropolitan Area Network (MAN)

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21**	Lecture No- **17** Week No- **05**

Course Name-Computer Application
Course Code-Th 1b
Periods/week-05
Duration of period - **55mins**
Topic- **COMPUTER NETWORK AND INTERNET**
  • Types of Network
	Essential Prerequisites-
	  • Basic idea about network
	  • Basic idea about Types of Network

Intended Learning Outcome expected- After the completion of this topic, students will be able to
  • Define network
  • Identify basic types of network

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
  • Ask students about Network.
  • Ask about its type.
  • Introduction of types of network.

DEFINITION:
Types of Network:
There are broadly classified into three types of computer network
1. LAN (Local Area Network)
   LAN is a small and single site network.

2. WAN (Wide Area Network)
   A WAN is a geographically dispersed collection of LANs

3. MAN (Metropolitan Area Network)
   It is a data network designed for a town or city

4. PAN (Personal Area Network)
   A personal area network (PAN) is a computer network used for communication among computer devices close to one person.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-07 Duration of period-**55mins** Topic- **COMPUTER NETWORK AND INTERNET** • Networking Devices like Hub, Repeater, Switch, Bridge, Router, Gateway & NIC	Lecture No- **18** Week No- **05**

	Essential Prerequisites-
	    • Basic idea about Networking Devices
	    • Basic idea about Networking Devices types

Intended Learning Outcome expected- After the completion of this topic, students will be able to

- Define network devices.
- Identify basic types of network devices.

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask students about Networking Devices
- Basic idea about types of network devices.

DEFINITION:

Network devices are required to provide an interface to connect multiple computers in a network.

There are many types of network devices used in networking.

- Hub
- Repeater
- Switch
- Bridge
- Router
- Gateway
- NIC

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-07 Duration of period-**55mins** Topic- **COMPUTER NETWORK AND INTERNET** • Internet Services like E-Mail, WWW, FTP, Chatting, Internet Conferencing, Electronic	Lecture No- **19** Week No- **05** **Essential Prerequisites**- • Basic idea about Internet service • Basic idea about Internet service types

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Define Internet Services
- Identify basic types of Internet services.

tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Ask students about Internet services.
- Introduction of Internet services and its types.

DEFINITION:

Internet is a network of networks that consists millions of private and public network of local to global scope.
An internet user can access to a wide variety of services such as
- E-MAIL (Electronic Mail)
- WWW (World Wide Web)
- FTP (File Transfer Protocol)
- Chatting
- Internet Conferencing
- Electronic Newspaper

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil Engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-08 Duration of period- **55mins** Topic- **COMPUTER NETWORK AND INTERNET** • Electronic Newspaper & Online Shopping	Lecture No- **20** Week No- **05**

	Essential Prerequisites- • Basic idea about Electronic Newspaper • Basic idea about Online Shopping

Intended Learning Outcome expected - After the completion of this topic, students will be able to
- Define Electronic Newspaper
- Define Online Shopping

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Ask students about Electronic newspaper and online shopping
- Introduction of Electronic newspaper and online shopping

DEFINITION:-

Electronic Newspaper:
- An electronic newspaper is a self-contained, reusable and refreshable version of a traditional newspaper that acquires and holds information electronically.
- Information to be displayed will be downloaded through some wireless internet connections.

Online Shopping:
- It is the process of buying goods and services from merchants who sell on the internet.
- The main components of online shopping are product, selling price, accessibility to people, placement of orders, mode of payments, delivery mechanism.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil Engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-08 Duration of period- **55mins** Topic- **COMPUTER NETWORK AND INTERNET** • Different types of Internet connectivity and ISP	Lecture No- **21** Week No- **06**
	Essential Prerequisites- • Basic idea about Internet connectivity • Basic idea about ISP

Intended Learning Outcome expected - After the completion of this topic, students will be able to
- Explain Internet connectivity
- Identify ISP

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Ask students about Internet connectivity
- Ask students about ISP
- Different types of Internet connectivity
- Introduction of ISP

DEFINITION:

There are different types of connections and speeds to get on the information super high way.
- Dial-Up Connections
1 Modem Dial-Up Connections
2 ISDN Dial-Up Connections
- ADSL Connections
- Cable Connections

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21**	Lecture No- **22** Week No- **06**

Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **File Management & Data Processing** • Concept of file and folder	

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- How to create a file & folder
- How to manage file and folder
- How to use file & folder

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask students about File Management.
- Ask about Data Processing.
- Introduction of File Folder.

DEFINITION:

FILE:

Files are the most basic unit of data that user can store on a disk. A file is the common storage unit in a computer. All program and data are contained in a file and the computer needs and writes files. In every program, image, video, song and document are stored in a file.

FOLDER:

- A folder is a collection of multiple files.
- A folder holds one or more files and it can be empty with just a name.
- Folder can also store other folders called subfolders.

Characteristics of FILE and FOLDER:

FILE:-

- A file always has a name.
- A file always takes up storage space.
- A file is always saved in a certain format: a body of text is saved in one of the many text file formats, a photo in one of the many image file formats, etc.

FOLDER:-

- Name specifies the name of the folder.
- Path specifies where the folder is generated in relation to the configuration directory.
- An element mapped to the folder specifies the elements you want to map to a folder.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **File Management & Data Processing** • File access and storage method	Lecture No- **23** Week No- **06**

	Essential Prerequisites-
	    • File access and storage method
	    • Various types of access method

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Sequential, direct, ISAM
- What is sequential access & direct access
- Define indexed sequential access method

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask students about File Access, Storage methods.
- Ask student about Sequential, Direct, ISAM

DEFINITION:

File Access:

When a file is used, information is read and accessed into computer memory and there are several ways to access this information of the file.

There are various types of file access methods: -

- Random Access or Direct Access
- Sequential Access
- Indexed Sequential Access Method (ISAM)

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-07 Duration of period-**55mins** Topic- **FILE MANAGEMENT AND DATA PROCESSING** • Sequential, Direct, ISAM	Lecture No- **24** Week No- **06**
	Essential Prerequisites- • Know about file and folder • Way to access different file system

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Get to know about Sequential, Direct and ISAM data processing Method

tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask students about File Access, Storage methods.
- Ask student about Sequential, Direct, ISAM

DEFINITION:

sequential and direct:

The process of searching the entire movie is called sequential access, because information is read in a particular order or sequence. If you can get to the record without following any sequence, this is called direct access.

ISAM:

ISAM (Indexed Sequential Access Method) is a file management system developed at IBM that allows records to be accessed either sequentially (in the order they were entered) or randomly (with an index). Each index defines a different ordering of the records.

Problems (5 mins)-

Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **File Management & Data Processing** • Data capture & data storage	Lecture No- **25** Week No- **07**

Essential Prerequisites-
  • Define data capture
  • What is single click
  • What is OCR & ICR
  • What is barcode
  • Define and explain IDR
  • Discuss the data storage devices

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Discuss about data capture and storage devices
- ICR , OCR & IDR

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Ask students about   Data Capture, Data storage
- Basic idea about Data Capture, Data storage

DEFINITION:-

What is data capture?

Data capture is the process of extracting information from paper or electronic documents and converting it into data for key systems. It's where most organizations begin their information management and digital transformation journey.

What is data storage?

Data storage refers to the use of recording media to retain data using computers or other devices. The most prevalent forms of data storage are file storage, block storage and object storage, with each being ideal for different purposes.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21**	Lecture No- **26** Week No- **07**
Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **File Management & Data Processing** • Data processing & data retrieval	**Essential Prerequisites**- • Define data processing • Different methods of data processing • Data Retrieval • Different methods of data recovery
Intended Learning Outcome expected- After the completion of this topic, students will be able to • Data processing & its method • Data retrieval & methods for data recovery	
Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Basic idea about Data Processing.
- Ask students about Data Processing and Retrieval.

DEFINITION:-

Data Processing

- Data processing must be processed in order to convert it into information.
- For this purpose, different operations may be performed on data.
- Data processing is defined as a sequence of operations on data to convert it into useful information.

The data processing can be accomplished through following methods:

1. Manual Data Processing
2. Mechanical Data Processing
3. Electronic Data Processing

Data Retrieval:-

- Data is one of the most important assets of any business.
- Data recovery refers to the whole process of salvaging this lost data that is corrupted, failed, damaged or inaccessible.

Following are some different methods of data recovery: -

1. Physical damage to storage devices
2. Media errors and corrupt partitions and file systems
3. Online data recovery

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21**	Lecture No- **27** Week No- **07**
Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Problem solving methodology** • Algorithm	**Essential Prerequisites**- • Basic steps in algorithm • Characteristics of algorithm • Advantage and disadvantage of algorithm • Analysis of algorithm

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Design an algorithm
- Understand about time complexity and space complexity

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Ask students about problem solving.
- Ask about Algorithm.
- Introduction of Algorithm.

DEFINITION:
PROBLEM SOLVING METHOD:
Problem solving is the act of defining a problem; determining the cause of the problem; identifying, prioritizing, and selecting alternatives for a solution; and implementing a solution.

ALGOTRITHM:
An algorithm is a set of instructions for solving a problem or accomplishing a task.
The characteristics of Algorithm are:
- Precise
- Unambiguous
- Finite termination
- Unique solution

Problems (5 mins)-	

Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Problem solving methodology** - Pseudo code - Flowchart	Lecture No- **28** Week No- **07**
	Essential Prerequisites- - Coding or programming - Advantages of pseudo code - Testing and debugging - Basic symbols used in flowchart - Types of flowcharts - Importance of flowchart - Advantage and disadvantage of flowchart

Intended Learning Outcome expected- After the completion of this topic, students will be able to - Define pseudo code and flowchart - Able to identify different types of error - Easy to design flowchart	
Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Ask students about Pseudo code.
- Ask student about Flowchart.

DEFINITION:

PSEUDO CODE:
It is a concise description algorithm in English language that uses programming language constructs. It contains outlines of the program that can be easily converted to program. It focuses on the logic of the algorithm without giving stress on the syntax of programming language.
Some of them are:
- If ... Endif
  Do while ... end do
  While ... end while
  Repeat ... until
  For ... end for
  Case end case
  Call
  Return

FLOWCHART:
Flowchart is a graphical or symbolic representation of the process of solution to a problem or algorithm. It helps to visualize the complex logic of the solution of the problem in a simplified manner through diagrammatic representation. Each step of the algorithm is presented using a symbol and a short description.

Problems (5 mins)-	

Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21**	Lecture No- **29** Week No- **08**

Program- Diploma in Civil engg.
Semester-1st & 2nd
Session- **2020-21**
Course Name-Computer Application
Course Code-Th 1b
Periods/week-05
Duration of period - **55mins**
Topic- **Problem solving methodology**
   • Generation of programming languages
	Essential Prerequisites-
	   • Generations of programming languages
	   • Advantages and disadvantages
	   • Types of programming languages

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Definitions of all generations of programming languages
- Difference between programming languages

tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Ask students about Programming language.
- Introduction of programming languages.

DEFINITION:
PROGRAMMING LANGUAGE:
Programming language is a tool to express the logic or instructions for understanding of the computer.
Any programming language has two components:
1. Syntax
2. Semantics

GENERATION OF PROGRAMMING LANGUAGES:
The Programming languages can be classified into 4 generations:
1. 1stGeneration: Machine Language
2. 2ndGeneration: Assembly Language
3. 3rdGeneration: High Level Language
4. 4thGeneration: Very High Level Language

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Problem solving methodology** • Structured programming languages	Lecture No- **30** Week No- **08**

	Essential Prerequisites-
	  • Structured programming in everyday life
	  • Extensions to structured programming

Intended Learning Outcome expected- After the completion of this topic, students will be able to   • To understand about structured programming in visual basic

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

  • Ask students about Structured programming language

  • Introduction of Structured Programming Language

DEFINITION:-

Structured Programming Language:

Structured Programming is also known as Modular Programming. In this type of programming technique, the program shall be broken into several modules. This helps in managing memory efficiently as the required module of the program will be loaded into the memory only and not the entire program. This will also enhance code reuse. Writing, understanding, debugging and modifying the individual module of the program is also easier.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

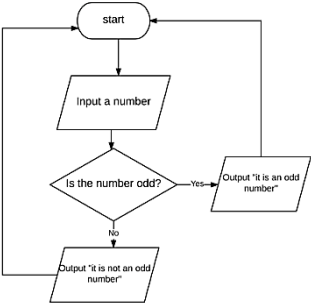| Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Problem solving methodology**	Lecture No- **31** Week No- **08**

	Essential Prerequisites-
	  • Different types of flowchart examples
	  • Explain different shapes of used in flowchart

• Examples of problem solving through flowchart	

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Easy to design flowchart
- To understand program with the help of flowchart

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Ask students to how to solve problem through flowchart.
- Give examples of Problem solving through Flowchart

DEFINITION:-

Algorithms are nothing but sequence of steps for solving problems. So a flow chart can be used for representing an algorithm. A flowchart, will describe the operations (and in what sequence) are required to solve a given problem. You can see a flow chart as a blueprint of a design you have made for solving a problem

Flowchart:-

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21**	Lecture No- **32** Week No- **08**

Course Name-Computer Application
Course Code-Th 1b
Periods/week-05
Duration of period - **55mins**
Topic- **Overviewing of C Programming language**
  • Constant in c programming
	Essential Prerequisites-
	  • When and why C language invented
	  • Basic concept of c programming
	  • Explain constant in C
	  • Different types of constants in C

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- To understand why C language is required
- Define constant

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Software concept
- Ask students about Computers Software.
- Ask about Application Software of computer.

DEFINITION:
In C programming language, a constant is similar to the variable but the constant hold only one value during the program execution. That means, once a value is assigned to the constant, that value can't be changed during the program execution. Once the value is assigned to the constant, it is fixed throughout the program. A constant can be defined as follows... A constant is a named memory location which holds only one value throughout the program execution. In C programming language, a constant can be of any data type like integer, floating point, character, string and double, etc.,
- Floating Point Constant
- Character Constant
- String Constant
- Integer Constant
- Creating Constant

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21**	Lecture No- **33** Week No- **09**
Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Overviewing of C Programming language** • Variables in C	**Essential Prerequisites**- • Define variables • Use of variables • Explain different types of variables
Intended Learning Outcome expected- After the completion of this topic, students will be able to • Why variable is needed • Defines and explain variable	
Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Ask students what is Operating System
- Introduction of Operating System

DEFINITION:
Variables in a c programming language are the named memory locations where the user can store different values of the same datatype during the program execution. That means a variable is a name given to a memory location in which we can store different values of the same data type. In other words, a variable can be defined as a storage container to hold values of the same data type during the program execution.

- Variable name should not start with a digit.
- Keywords should not be used as variable names.
- A variable name should not contain any special symbols except underscore (_).
- A variable name can be of any length but compiler considers only the first 31 characters of the variable name.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Overviewing of C Programming language** • Data types in C	Lecture No- **34** Week No- **09**
	Essential Prerequisites- • Define data types • Explain different types of data types

Intended Learning Outcome expected- After the completion of this topic, students will be able to • Use of data types • How data type is important in C programming

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Basic idea about Operating System.
- Ask students about Batch Processing, Multiprogramming
- Introduction of Operating System and types of OS.

DEFINITION:-

Data types in the c programming language are used to specify what kind of value can be stored in a variable. The memory size and type of the value of a variable are determined by the variable data type. In a c program, each variable or constant or array must have a data type and this data type specifies how much memory is to be allocated and what type of values are to be stored in that variable or constant or array.

¬ Primary data types (Basic data types OR Predefined data types)

¬ Derived data types (Secondary data types OR User-defined data types)

¬ Enumeration data types

¬ Void data type

C programming language provides built-in functions to perform output operation. The output operations are used to display data on user screen (output screen) or printer or any file. The c programming language provides the following built-in output functions.

- printf()

- putchar()

- puts()

- fprintf()

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Overviewing of C Programming language** • Operators in C	Lecture No- **35** Week No- **09**
	Essential Prerequisites- • Define operators • Types of operators

Intended Learning Outcome expected- After the completion of this topic, students will be able to • Use of operators •

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Basic idea about DOS.
- Ask students about Windows and Unix.

DEFINITION: -

An operator is a symbol used to perform arithmetic and logical operations in a program. That means an operator is a special symbol that tells the compiler to perform mathematical or logical operations. C programming language supports a rich set of operators that are classified as follows.

- Arithmetic Operators
- Relational Operators
- Logical Operators
- Increment & Decrement Operators
- Assignment Operators
- Bitwise Operators
- Conditional Operator
- Special Operators

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Overviewing of C Programming language** • Operators	Lecture No- **36** Week No- **09**
	Essential Prerequisites- • Explain different types of operators

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Need of operators in C programming

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

DEFINITION:
In any programming language, if we want to perform any calculation or to frame any condition etc., we use a set of symbols to perform the task. These set of symbols makes an expression.
In the C programming language, an expression is defined as follows.
An expression is a collection of operators and operands that represents a specific value. In the above definition, an operator is a symbol that performs tasks like arithmetic operations, logical operations, and conditional operations, etc. Operands are the values on which the operators perform the task. Here operand can be a direct value or variable or address of memory location.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Overviewing of C Programming language** • Expressions in C	Lecture No- **37** Week No- **10**

	Essential Prerequisites-
	    • Define expressions
	    • Use of expressions

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Use of expressions in C

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

DEFINITION:
In any programming language, if we want to perform any calculation or to frame any condition etc., we use a set of symbols to perform the task. These set of symbols makes an expression.
In the C programming language, an expression is defined as follows.
An expression is a collection of operators and operands that represents a specific value. In the above definition, an operator is a symbol that performs tasks like arithmetic operations, logical operations, and conditional operations, etc. Operands are the values on which the operators perform the task. Here operand can be a direct value or variable or address of memory location.

- Infix Expression
- Postfix Expression
- Prefix Expression

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Overviewing of C Programming language** • Different types of expressions in C	Lecture No- **38** Week No- **10**

	Essential Prerequisites-
	   • Define Infix expression
	   • Define postfix expression
	   • Define Prefix expression

Intended Learning Outcome expected- After the completion of this topic, students will be able to • Explanation of all expressions in C	
Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-

- Infix Expression
- Postfix Expression
- Prefix Expression

Infix expression
Infix expression: The expression of the form a op b. When an operator is in-between every pair of operands.
Postfix expression: The expression of the form a b op. When an operator is followed for every pair of operands.

Postfix expression

If we move the operators after the operands then it is known as a postfix expression. In other words, postfix expression can be defined as an expression in which all the operators are present after the operands. For example: If the infix expression is A + B * C.

Prefix Expression

In other words, prefix expression can be defined as an expression in which all the operators precede the two operands. For example: If the infix expression is given as: A + B * C. As we know that the multiplication operator * has a higher precedence than the addition operator.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Overviewing of C Programming language** • Type conversion & Typecasting	Lecture No- **39** Week No- **10**
	Essential Prerequisites- • Define Type conversion • Define Type casting •

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Need of type conversion and type casting
  - •

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Discuss about Computer Virus
- Ask students about Computer Virus

DEFINITION:

The type conversion is the process of converting a data value from one data type to another data type automatically by the compiler. Sometimes type conversion is also called implicit type conversion. The implicit type conversion is automatically performed by the compiler.

Typecasting is also called an explicit type conversion. Compiler converts data from one data type to another data type implicitly. When compiler converts implicitly, there may be a data loss. In such a case, we convert the data from one data type to another data type using explicit type conversion.

To perform this, we use the unary cast operator. To convert data from one type to another type we specify the target data type in parenthesis as a prefix to the data value that has to be converted. The general syntax of typecasting

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Program- Diploma in Civil engg. Semester-1ˢᵗ & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Overviewing of C Programming language** • Decision Control	Lecture No- **40** Week No- **10**
	Essential Prerequisites- • Control Structures • What is decision making statement • Types of control statement in C

Intended Learning Outcome expected- After the completion of this topic, students will be able to
  • Need of decision control statement in C

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
  • Ask students about Domain.
  • Introduction Application of computer in different Domain.

DEFINITION:
If statement:
The statements inside if body executes only when the condition defined by if statement is true. If the condition is false then compiler skips the statement enclosed in if's body. We can have any number of if statements in a C program.
If-else statement:
In this decision control statement, we have two blocks of statements. If condition results true then if block gets executed else statements inside else block executes. else cannot exist without if statement. In this tutorial, I have covered else-if statements as well.
Switch-case statement:
This is very useful when we need to evaluate multiple conditions. The switch block defines an expression (or condition) and case has a block of statements, based on the result of expression, corresponding case block gets executed. A switch can have any number of cases, however there should be only one default handler.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1ˢᵗ & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins**	Lecture No- **41** Week No- **11**
	Essential Prerequisites- • Syntax for each statement of C

Topic- **Overviewing of C Programming language**	• Write a simple program for each statement of C
• Looping Statement	

Intended Learning Outcome expected- After the completion of this topic, students will be able to
  • Syntax and programs for all decision control statements

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description(35mins)-

Definition:
The looping statements are used to execute a single statement or block of statements repeatedly until the given condition is FALSE.
  • While Statement
  • Do-While Statement
  • For Statement

Problems (10 mins)-	
Model/previous year Questions (5 mins)-	
Discussions/Revisions & Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Overviewing of C Programming language** • Break, Continue & goto	Lecture No- **42** Week No- **11**
	Essential Prerequisites- • Know about different types of loops

Intended Learning Outcome expected- After the completion of this topic, students will be able to
  • Break, Continue & goto

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description(35mins)-

Definition:

break statement
In C programming, break statement is used with conditional if statement.
The break is used in terminating the loop immediately after it is encountered.
it is also used in switch...case statement. which is explained in next topic.

Syntax:

break;

The break statement can be used in terminating loops like for, while and do...while

continue statement

It is sometimes desirable to skip some statements inside the loop. In such cases, continue statement is used.

Syntax:

continue;

goto statement

In C programming, goto statement is used for altering the normal sequence of program execution by transferring control to some other part of the program.

Syntax:

goto label;

....

....

....

label:

statement;

Problems (10 mins)-	
Model/previous year Questions (5 mins)-	
Discussions/Revisions & Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21**	Lecture No- **43** Week No- **11**
Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Overviewing of C Programming language** • Assignment 1	**Essential Prerequisites**- • Know about If-else
Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description(35mins)-

Assignment
- Program to Check Even or Odd
- Program to Check Vowel or consonant

Problems (10 mins)-	
Model/previous year Questions (5 mins)-	
Discussions/Revisions & Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg.	Lecture No- **44**
Semester-1st & 2nd	Week No- **11**
Session- **2020-21**	
Course Name-Computer Application	**Essential Prerequisites**-
Course Code-Th 1b	Know about Loop
Periods/week-05	
Duration of period - **55mins**	
Topic- **Overviewing of C Programming language**	
• Assignment 2	

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description(35mins)-

- Program to Check Leap Year
- Program to Check Alphabet
- To find the Factorial of a Number

Problems (10 mins)-	
Model/previous year Questions (5 mins)-	
Discussions/Revisions & Attendance (5 mins)-	
References-	

Lecture Plan

program-Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-15 Duration of period-**55mins** Topic- Overview of C programming Language Assignment 3	Lecture No- **45** Week No- **12**
	Essential Prerequisites- Know about If-else and loop

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description(35mins)-

- Multiplication Table Up to 10
- To Reverse an Integer number
- Program to Check Palindrome

Problems (10 mins)-	
Model/previous year Questions (5 mins)-	
Discussions/Revisions & Attendance (5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Overviewing of C Programming language** Assignment 4	Lecture No- **46** Week No- **12**
	Essential Prerequisites- Write C programming using each operators

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Simple programs using each operators

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description(35mins)-

- Simple C programs using each operator

Problems (5 mins)-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21**	Lecture No- **47** Week No- **12**

Course Name-Computer Application
Course Code-Th 1b
Periods/week-05
Duration of period - **55mins**
Topic- **Advanced features of C**
    • Functions
	Essential Prerequisites-
	    • Definition of functions
	    • Parts of functions

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Use of functions in C
- All parts of functions

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- Ask students to What is C language.
- Ask students about What is the use of C language.
- Ask about Evolution of C.

The Use Of C Language :

A system programming language is used to create system software. C language is a system programming language because it can be used to do low-level programming (for example driver and kernel). It is generally used to create hardware devices, OS, drivers, kernels, etc. For example, Linux kernel is written in C. It can't be used for internet programming like Java, .Net, PHP, etc.

Function of C:

C Functions help in the optimization of the C Program because we don't need to write much code. Declaration of C Function, tells the compiler about a function's name, it's the return type and the parameters. We can define the actual body of the function separately.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

Program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **Advanced features of C** • Passing parameters in C by using call by value and call by reference	Lecture No- **48** Week No- **12**
	Essential Prerequisites- • Write a program by using call by value • Write a program by using call by reference

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Write a C program to swapping the values of two variables using call by values
- Write a C program to swapping the values of two variables using call by reference

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- What is Passing parameters techniques in C ?
- Passing parameters Terminology.
- Important methods of parameter passing.

Passing parameters techniques :

There are different ways in which parameter data can be passed into and out of methods and functions. Let us assume that a function B() is called from another function A(). In this case A is called the "caller function" and B is called the "called function or callee function". Also, the arguments which A sends to B are called actual arguments and the parameters of B are called formal arguments.

Passing parameters Terminology :

- **Formal Parameter :** A variable and its type as they appear in the prototype of the function or method.
- **Actual Parameter :** The variable or expression corresponding to a formal parameter that appears in the function or method call in the calling environment.
- **Modes:**
  - **IN:** Passes info from caller to callee.
  - **OUT:** Callee writes values in caller.
  - **IN/OUT:** Caller tells callee value of variable, which may be updated by callee.

Important methods of parameter passing :

- Pass By Value Or Call By Value
- Pass By Reference(aliasing) Or Call By Reference

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1ˢᵗ & 2nd Session- **2020-21**	Lecture No- **49** Week No- **13**
Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **ADVANCED FEATURES OF C** • Scope of Variables and Storage Classes	**Essential Prerequisites**- • Syntax of C Programming

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Scope defines the visibility of an object. It defines where an object can be accessed.
- The scope variable is local or global

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- What is Scope of variables in C?
- What are Storage Classes in C?

Scope:
- Scope defines the visibility of an object. It defines where an object can be accessed.
- The scope variable is local or global
- The variable defined within the block has local scope.
- They are visible only to the block in which they are defined.
- The variable defined in global area is visible from their definition until the end of program. It is visible everywhere in program.

Storage Classes:
Storage classes specify the scope, lifetime and binding of variables.
To fully define a variable, one needs to mention not only its 'type' but also its storage class.
A variable name identifies some physical location within computer memory, where a collection of bits are allocated for storing values of variable.

Storage class tells us the following factors –

- Where the variable is stored (in memory or cpu register)?
- What will be the initial value of variable, if nothing is initialized?
- What is the scope of variable (where it can be accessed)?
- What is the life of a variable?

- Following is the C program for the scope of a variable –

```c
#include<stdio.h>
int c= 30; /* global area */
main ( ) {
   int a = 10; //local scope//
   printf ("a=%d,c=%d"a,c);
   fun ( );
```

```
}
fun ( ){
    printf ("c=%d",c); //global variable
}
```

Output

When the above program is executed, it produces the following output –

```
a =10, c = 30
c = 30
```

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **ADVANCED FEATURES OF C** • Recursion Function and types of recursion	Lecture No- **50** Week No- **13**
	Essential Prerequisites- • Define recursion

Intended Learning Outcome expected- After the completion of this topic, students will be able to
  • Write a C program by using recursive call of the function

Tools Used-	Chalk, duster, Blackboard, projector

Recursion Function

Recursion are mainly of two types depending on whether a function calls itself from within itself or more than one function call one another mutually. The process in which a function calls itself directly or indirectly is called recursion and the corresponding function is called a recursive function.

Type of Recursion

Type of Recursion

1. Direct Recursion

2. Indirect Recursion

3. Tail Recursion

4. No Tail/ Head Recursion

5. Linear recursion

6. Tree Recursion

Direct Recursion = When a function calls itself within the same function repeatedly, it is called the direct recursion.

```
#include<stdio.h>
int fibo_num (int i)
{
// if the num i is equal to 0, return 0;
if ( i == 0)
{
return 0;
}
if ( i == 1)
```

```c
{
return 1;
}
return fibo_num (i - 1) + fibonacci (i -2);
}
int main ()
{
int i;
// use for loop to get the first 10 fibonacci series
for ( i = 0; i < 10; i++)
{
printf (" %d \t ", fibo_num (i));
}
return 0;
}
```

Indirect Recursion = When a function is mutually called by another function in a circular manner, the function is called an indirect recursion function.

```c
#include <stdio.h>
// declaration of the odd and even() function
void odd(); // Add 1 when the function is odd()
void even(); // Subtract 1 when the function is even
int num = 1; // global variable
void odd ()
{
   // if statement check and execute the block till n is less than equal to 10
   if (num <= 10)
   {
      printf (" %d ", num + 1);  // print a number by adding 1
      num++; // increment by 1
      even(); // invoke the even function
   }
   return;
}
void even ()
{
   // if block check the condition that n is less than equal to 10
   if ( num <= 10)
```

```c
  {
    printf (" %d ", num - 1); // print a number by subtracting 1
    num++;
    odd(); // call the odd() function
  }
  return;
}
int main ()
{
  odd(); // main call the odd() function at once
  return 0;
}
```

Tail Recursion = A recursive function is called the tail-recursive if the function makes recursive calling itself, and that recursive call is the last statement executes by the function. After that, there is no function or statement is left to call the recursive function.

```c
#include <stdio.h>
// function definition
void fun1( int num)
{
  // if block check the condition
  if (num == 0)
    return;
  else
    printf ("\n Number is: %d", num); // print the number
  return fun1 (num - 1);    // recursive call at the end in the fun() function
}
int main ()
{
  fun1(7); // pass 7 as integer argument
  return 0;
}
```

No Tail/ Head Recursion = A function is called the non-tail or head recursive if a function makes a recursive call itself, the recursive call will be the first statement in the function. It means there should be no statement or operation is called before the recursive calls.

```c
#include <stdio.h>
```

```c
void head_fun (int num)
{
if ( num > 0 )
{
// Here the head_fun() is the first statement to be called
head_fun (num -1);
printf (" %d", num);
}
}
int main ()
{
int a = 5;
printf (" Use of Non-Tail/Head Recursive function \n");
head_fun (a); // function calling
return 0;
}
```

Linear recursion = A function is called the linear recursive if the function makes a single call to itself at each time the function runs and grows linearly in proportion to the size of the problem.

```c
#include <stdio.h>
#define NUM 7
int rec_num( int *arr, int n)
{
   if (n == 1)
   {
      return arr[0];
      }
   return Max_num (rec_num (arr, n-1), arr[n-1]);
}
// get the maximum number
int Max_num (int n, int m)
{
   if (n > m)
      return n;
   return m;
}
int main ()
{
   // declare and initialize an array
```

```c
    int arr[NUM] = { 4, 8, 23, 19, 5, 35, 2};
    int max = rec_num(arr, NUM); // call function
    printf (" The maximum number is: %d\n", max); // print the largest number
}
```

Tree Recursion = A function is called the tree recursion, in which the function makes more than one call to itself within the recursive function.

```c
#include <stdio.h>
// It is called multiple times inside the fibo_num function
int fibo_num (int num)
{
if (num <= 1)
    return num;
return fibo_num (num - 1 ) + fibo_num(num - 2);
}
void main()
{
int num = 7;
printf (" Use of Tree Recursion: \n");
// print the number
printf (" The Fibonacci number is: %d", fibo_num(7));
}
```

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **ADVANCED FEATURES OF C** • One Dimensional Array	Lecture No- **51** Week No- **13**

	Essential Prerequisites-
	   • Define one dimensional array
	   • Some examples of one-dimensional array

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Write a C program of one-dimensional array

Tools Used-	Chalk, duster, Blackboard, projector

Definition:
One-Dimensional Array
A One-Dimensional Array is the simplest form of an Array in which the elements are stored linearly and can be accessed individually by specifying the index value of each element stored in the array. The first two are just like a matrix, but the third dimension represents pages or sheets of elements.

Program
```c
#include <stdio.h>
int main() {
        int arr[3] = {10, 20, 30}; //declaring and initializing one-dimensional array in C

        // After declaration, we can also initialize array as:
        // arr[0] = 10; arr[1] = 20; arr[2] = 30;

        for (int i = 0; i < 3; i++) {
                // accessing elements of array
                printf(" Value of arr[%d]: %d\n", i, arr[i]);
        }
}
```

Output
Value of arr[0]: 10
 Value of arr[1]: 20
 Value of arr[2]: 30

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1ˢᵗ & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **ADVANCED FEATURES OF C** • Multi-Dimensional Array	Lecture No- **52** Week No- **13**
	Essential Prerequisites- • Define Multidimensional array • Some examples of Multidimensional array

Intended Learning Outcome expected- After the completion of this topic, students will be able to
 • Write a C program of Multidimensional array

Tools Used-	Chalk, duster, Blackboard, projector

Definition:
Multidimensional Array
In C/C++, we can define multidimensional arrays in simple words as an array of arrays. Data in multidimensional arrays are stored in tabular form (in row-major order). The total number of elements that can be stored in a multidimensional array can be calculated by multiplying the size of all the dimensions.

Program

```c
// C program to store temperature of two cities of a week and display it.
#include <stdio.h>
const int CITY = 2;
const int WEEK = 7;
int main()
{
  int temperature[CITY][WEEK];

  // Using nested loop to store values in a 2d array
  for (int i = 0; i < CITY; ++i)
  {
   for (int j = 0; j < WEEK; ++j)
   {
     printf("City %d, Day %d: ", i + 1, j + 1);
     scanf("%d", &temperature[i][j]);
   }
  }
  printf("\nDisplaying values: \n\n");

  // Using nested loop to display vlues of a 2d array
  for (int i = 0; i < CITY; ++i)
  {
   for (int j = 0; j < WEEK; ++j)
   {
     printf("City %d, Day %d = %d\n", i + 1, j + 1, temperature[i][j]);
   }
  }
  return 0;
}
```

Output

City 1, Day 1: 33
City 1, Day 2: 34
City 1, Day 3: 35
City 1, Day 4: 33
City 1, Day 5: 32
City 1, Day 6: 31
City 1, Day 7: 30
City 2, Day 1: 23
City 2, Day 2: 22
City 2, Day 3: 21
City 2, Day 4: 24
City 2, Day 5: 22
City 2, Day 6: 25
City 2, Day 7: 26

Displaying values:

City 1, Day 1 = 33
City 1, Day 2 = 34
City 1, Day 3 = 35
City 1, Day 4 = 33
City 1, Day 5 = 32
City 1, Day 6 = 31
City 1, Day 7 = 30
City 2, Day 1 = 23
City 2, Day 2 = 22
City 2, Day 3 = 21
City 2, Day 4 = 24
City 2, Day 5 = 22
City 2, Day 6 = 25
City 2, Day 7 = 26

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **ADVANCED FEATURES OF C** String Operation	Lecture No- **53** Week No- **14**
	Essential Prerequisites- Discuss about string operation

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Use of string operation in C

Tools Used-	Chalk, duster, Blackboard, projector

Definition:

String operations

String operators or string functions can be used directly to manipulate the strings. A language is a finite or infinite set of strings. Besides the usual set operations like union, intersection etc., concatenation can be applied to languages: if both and are languages, their concatenation is defined as the set of concatenations of any string from and any string from

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **ADVANCED FEATURES OF C** • Pointer	Lecture No- **54** Week No- **14**

	Essential Prerequisites-
	    • Define pointers
	    • How to use pointers

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- Use of pointers

Tools Used-	Chalk, duster, Blackboard, projector

Definition:

Pointers

The pointer in C language is a variable which stores the address of another variable. This variable can be of type int, char, array, function, or any other pointer. The size of the pointer depends on the architecture. A pointer is used to access the memory location. There are various types of pointers such as a null pointer, wild pointer, void pointer and other types of pointers.

Pointers Expression

Pointers are used to point to address the location of a variable. A pointer is declared by preceding the name of the pointer by an **asterisk(*)**. We can add an integer or subtract an integer using a pointer pointing to that integer variable. The given table shows the arithmetic operators that can be performed on pointer variables: Examples: *ptr1 + *ptr2 *ptr1 * *ptr2 *ptr1 + *ptr2 - *ptr3. We can also directly perform arithmetic expression using integers

Program
```
#include<stdio.h>
int main(){
int number=50;
int *p;
p=&number;//stores the address of number variable
printf("Address of p variable is %x \n",p); // p contains the address of the number therefore printing p gives the address of number.
printf("Value of p variable is %d \n",*p); // As we know that * is used to dereference a pointer therefore if we print *p, we will get the value stored at the address contained by p.
return 0;
}
```

Output
Address of number variable is fff4
Address of p variable is fff4
Value of p variable is 50

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	

Attendance(5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **ADVANCED FEATURES OF C** • Pointer Arithmetic programming assignment using the pointer	Lecture No- **55** Week No- **14**
	Essential Prerequisites- • Define pointer arithmetic programming

Intended Learning Outcome expected- After the completion of this topic, students will be able to
• About pointer arithmetic programming

Tools Used-	Chalk, duster, Blackboard, projector

Definition:

Pointers Expression

Pointers are used to point to address the location of a variable. A pointer is declared by preceding the name of the pointer by an **asterisk(*)**. We can add an integer or subtract an integer using a pointer pointing to that integer variable. The given table shows the arithmetic operators that can be performed on pointer variables: Examples: *ptr1 + *ptr2 *ptr1 * *ptr2 *ptr1 + *ptr2 - *ptr3. We can also directly perform arithmetic expression using integers

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **ADVANCED FEATURES OF C** • Structure	Lecture No- **56** Week No- **14**

	Essential Prerequisites-
	   • Define structure
	   • How to create structure
	   • How to declare structure variables

Intended Learning Outcome expected- After the completion of this topic, students will be able to
- How to create and declare structure

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- What is Structure in C?

Structure:

A Structure is a type of data that is user-defined. It is available in the C programming language that allows a user to combine together logically related data items of various data types. Structures basically represent a record.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** Topic- **ADVANCED FEATURES OF C** • Union	Lecture No- **57** Week No- **15**

	Essential Prerequisites-
	    • Define union
	    • Standard library functions

Intended Learning Outcome expected- After the **completion** of this topic, students will be able to
- Unions and standard library functions.

Tools Used-	Chalk, duster, Blackboard, projector

Lecture Description (40 mins)-
- What is Union in C?

Union:

A Union is a type of data that is user-defined. It is just like the structure. The Union combines various objects of different sorts and sizes together. A user can define a Union using many members, but only one of them holds a value at any given time. It provides you with an efficient way of using a single memory location for various purposes.

Difference Between Structure and Union in C

Parameter	Structure	Union
Keyword	A user can deploy the keyword struct to define a Structure.	A user can deploy the keyword union to define a Union.
Internal Implementation	The implementation of Structure in C occurs internally- because it contains separate memory locations allotted to every input member.	In the case of a Union, the memory allocation occurs for only one member with the largest size among all the input variables. It shares the same location among all these members/objects.
Accessing Members	A user can access individual members at a given time.	A user can access only one member at a given time.
Syntax	The Syntax of declaring a Structure in C is: struct [structure name] { type element_1; type element_2; . . } variable_1, variable_2, …;	The Syntax of declaring a Union in C is: union [union name] { type element_1; type element_2; . . } variable_1, variable_2, …;
Size	A Structure does not have a shared location for all of its members. It makes the size of a Structure to be	A Union does not have a separate location for every member in it. It makes its size equal to the size of the

	greater than or equal to the sum of the size of its data members.	largest member among all the data members.
Value Altering	Altering the values of a single member does not affect the other members of a Structure.	When you alter the values of a single member, it affects the values of other members.
Storage of Value	In the case of a Structure, there is a specific memory location for every input data member. Thus, it can store multiple values of the various members.	In the case of a Union, there is an allocation of only one shared memory for all the input data members. Thus, it stores one value at a time for all of its members.
Initialization	In the case of a Structure, a user can initialize multiple members at the same time.	In the case of a Union, a user can only initiate the first member at a time.

Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	

Lecture Plan

program- Diploma in Civil engg. Semester-1st & 2nd Session- **2020-21** Course Name-Computer Application Course Code-Th 1b Periods/week-05 Duration of period - **55mins** **Topic**- Previous year Question Answer Discussion	Lecture No- **58-60** Week No- **15**
	Essential Prerequisites-

Questions:

Total Pages— 2   I—Sem/COMMON/2018(W)(New)

COMPUTER APPLICATION

(Theory — 1(b))

Full Marks : 80

Time : 3 hours

Answer any five questions including Q. Nos. 1 & 2

Figures in the right-hand margin indicate marks

1. Answer the following questions :   2 × 10
   (a) What are the principal components used in 2nd and 3rd generation computer ?
   (b) Define GUI.
   (c) Define FTP.
   (d) What is internet ?
   (e) What is the difference between file and folder ?
   (f) Define flowchart.
   (g) What are the various data types available in 'C' language ?
   (h) Write down the equivalent C expression for $b^2 - 4ac$.
   (i) Define array.
   (j) What is ALU ?

2. Answer any *five* questions :   6 × 5
   (a) Give a brief idea about the classification of computers.
   (b) Define compiler. How it is different from Interpreter ?
   (c) Explain about different types of file access method.
   (d) Discuss about different functions of operating system.
   (e) What is E-mail ? Explain the features of E-mail.
   (f) What is loop ? Explain different types of loops in 'C' with syntax.
   (g) Draw a flowchart to find out the largest number among three numbers.

3. Define memory. Give the characteristics of different types of memory of a computer system.   10

4. Draw a flowchart and write a program in 'C' to find out factorial of a given number 'n'.   10

(*Turn Over*)

(2)

5. What do you mean by network topology ? What are the major types of network topologies ? Explain each type in brief.   10

6. What is virus ? How does virus spread and what are the symptoms of virus attack ?   10

7. Write short notes on (any *two*) :   5 × 2
   (i) Software
   (ii) WINDOWS Operating System
   (iii) Arithmetic relational operators in 'C'.

I- SEM COMMON/2019(W)/(New)

TH-1(b)-COMPUTER APPLICATION

Full Marks: 80   Time: 3 Hours

Answer any Five Questions including Q No. 1 & 2

Figures in the right hand margin indicates marks

1. Answer all the questions in briefly :   2×10

   a) What is FTP?

   b) What is computer virus?

   c) What is flowchart?

   d) Define OMR.

   e) What is recursion function?

   f) What are the basic data types available in C?

   g) Write down the name of four input devices?

   h) What is Internet?

   i) What is ALU?

   j) Differentiate between hardware & software?

2. Answer any five questions :

   a) Describe the detection & prevention of computer virus.   6×5

   b) Differentiate between RAM & ROM.

   c) Explain briefly the advantages & disadvantages of network topology.

   d) What are the functions of operating system? Explain Briefly?

   e) Draw a flowchart to find the greatest number among three numbers.

   f) What is Looping? What are the types of looping available in C program? Explain with suitable example?

   g) What is Network? What are the types of network? Explain the function of each network?

3. Write short notes on

   i> LAN   10

   ii> Switch

   iii> Data Capture

   iv> Compiler

   v> Router

4. Write a C program to calculate $x^1 + x^2 + \text{———————} + x^n$ 10

5. What is file & What is Folder? Explain briefly the types of file access methods.   10

6. What is computer memory? Briefly explain different types of computer memory. Differentiate SRAM & DRAM.   10

7. What are the types of software? Explain batch processing operating system. What are the features of DOS & Unix?   10

COMPUTER APPLICATION

(Theory : 1(b))

Full Marks : 80   Time : 3 hours

Answer any five questions including Q. Nos. 1 & 2

Figures in the right-hand margin indicate marks

1. Answer the following :   2 × 10

   (a) Define hybrid computer.

   (b) What is CPU ?

   (c) What do you mean by multitasking operating system ?

   (d) Define WWW.

   (e) Define algorithm.

   (f) What is folder ?

   (g) Differentiate between constants and variables in C program.

   (h) State the different types of relational operators provided by C.

   (i) Define protocol.

   (j) What do you mean by compiler ?

2. Answer the following :   5 × 6

   (a) Discuss the generation of computer. Explain the key features of computers of each generation.

   (b) Compare the features of DOS and WINDOWS operating system.

   (c) Define software. Describe various type of software and briefly explain them.

   (d) What is file access ? Explain the various types of file access method.

   (e) Define network. Explain various types of network.

   (f) Draw a flowchart to convert temperature from degree Celsius to Fahrenheit.

3. Explain the components of computer with a block diagram.   10

4. Draw a flowchart and write a program in 'C' to find out whether a number is odd or even.   10

5. Define operating system. Explain different types of operating system.   10

6. What is topology ? Explain various types of topologies.   10

(Turn Over)

5 / 2

7. Write short notes on (any *two*) :

    (*i*) Loops in C

    (*ii*) Virus

    (*iii*) Data transmission mode

    (*iv*) Arrays in 'C'.

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Tools Used-	Chalk, duster, Blackboard, projector
Problems (5 mins)-	
Model/previous year Questions (5 mins)-	
Attendance(5 mins)-	
References-	