Chapter-1st
Number System

A. Objective Type Questions:

1. Which of the following is the smallest number in the hexadecimal system?
   a) 0 b) 1 c) A d) F
2. What is the binary equivalent of the decimal number 15?
   a) 0111 b) 1111 c) 0101 d) 0011
3. Which number system is most commonly used in everyday arithmetic?
   a) Binary b) Decimal c) Hexadecimal d) Octal
4. Radix of hexadecimal numbers System is
   a) 2 b) 5 c) 8 d) 16
5. $(38CB)_{16}$ is an example of which number system is?
   a) Binary b) Decimal c) Hexadecimal d) Octal

Ans: 1) a) 0 2) b) 1111 3) b) Decimal 4) d) 16 5) c) Hexadecimal

B. Write True or False for the following Statements:

1. The Binary Number 1111 represents the decimal number 15.
2. The hexadecimal system uses 2 as its base/radix.
3. Octal word comes from Latin word Oct which means 8.
4. The Binary Number System can represent any number using digits only 0 and 1.
5. In the Octal Number System, the digit '9' is valid.
6. In the Hexadecimal System, the letter 'B' represents the Decimal value 12.
7. Roman Number System is an example of Positional Number System

Ans: 1) True 2) False 3) True 4) True
5) False 6) False 7) False

C. Short Answer Type Questions:

Que 1: What is Number System? Write the name of basic categories of Number Systems?

Ans: Number systems are used to represent numbers. Each number system has its own set of symbols and rules to represent numbers. Number systems can be divided into two basic categories:

1. Non-Positional Number Systems – Example: Roman numeral system
2. Positional Number Systems – Example: Decimal, Binary, Octal and Hexadecimal systems

Que 2: Explain Decimal Number System?

Ans: This is a Positional Number System. In this Number System, 10 different symbols 0,1, 2, 3, 4, 5, 6, 7, 8 and 9 are used to represent numbers. For this reason, this number system is called the Decimal Number System. The base/radix value of this number system is 10. This number system is also known as Base-10 system. It is the most widely used number system in daily life.

Que 3: What is Binary Number System? Who is the inventor of this Number System?

Ans: This is a Positional Number System. In this Number System, 2 different symbols 0 and 1 are used to represent numbers. For this reason, this number system is called Binary Number System. The base/radix value of this number system is 2. This number system is also known as Base-2 system. This number system is used in computer science and digital electronics. The inventor of binary number system is Gottfried Wilhelm Leibniz.

Que 4: Explain Octal Number System?

Ans: It is a Positional Number System. In this number system, 8 different symbols 0,1, 2, 3, 4, 5, 6 and 7 are used to represent numbers. For this reason, this number system is called the Octal Number System. The base/radix value of this number system is 8. This number system is also known as Base-8 system. This number system is often used in various fields such as Computer Programming, setting file permissions in the Unix OS.

Que 5: What is Hexadecimal Number System?

Ans: It is a Positional Number System. The word Hexadecimal is made up of two words 'Hexa' and 'Decimal', where 'Hexa' means 6 and 'Decimal' means 10. Therefore, this number system uses 16 symbols: ten Decimal Digits from 0 to 9 and six letter A, B, C, D, E, F (or a to f). The base/radix value of this number system is 16. This number system is also known as Base-16 system. Hexadecimal numbers are commonly used in Programming and Digital Electronics.

D. Perform the following Conversions of Number Systems:

1. $(25)_{10}$ = $(11001)_2$ = $(31)_8$ = $(19)_{16}$
2. $(10111)_2$ = $(23)_{10}$ = $(27)_8$ = $(17)_{16}$
3. $(47)_8$ = $(39)_{10}$ = $(100111)_2$ = $(27)_{16}$
4. $(A4)_{16}$ = $(164)_{10}$ = $(10100100)_2$ = $(244)_8$

1.1 Complete the following Table: (Lab Activity)

Decimal	Binary	Octal	Hexa-Decimal
0	0000	0	0
1	0001	1	1
2	0010	2	2
3	0011	3	3
4	0100	4	4
5	0101	5	5
6	0110	6	6
7	0111	7	7
8	1000	10	8
9	1001	11	9
10	1010	12	A
11	1011	13	B
12	1100	14	C
13	1101	15	D
14	1110	16	E
15	1111	17	F

1.2 Complete the following Table: (Lab Activity)

Decimal	Binary	Octal	Hexa-Decimal
23	10111	27	17
61	111101	75	3D
23	10111	27	17
908	1110001100	1614	38C
89	1011001	131	59
17	10001	21	11
143	10001111	217	8F
31	11111	37	1F
154	10011010	232	9A
99	1100011	143	63

Chapter-2nd
Basic Concepts of Python Programming

A. Multiple Choice Questions:

1. The _____ is a default editor that accompanies Python.
   a. IDLE b. IPLE c. Text Editor d. Notepad
2. The _____ is the shell prompt where we type in our commands.
   a. << b. >> c. >>> d. <<<
3. IDE stands for _____
   a. Integrated Direct Environment b. Integrated Development Environment
   c. Information Development Environment d. None of these
4. To run a script file code in Python, we can use _____ shortcut key.
   a. F1 b. F2 c. F5 d. F7
5. _____ are like words and punctuation marks in English language.
   a. Literals b. Identifiers c. Variables d. Tokens
6. _____ are the names given to program elements, such as variable, function, list, tuples, etc. for their identification.
   a. Literals b. Identifiers c. Variables d. Tokens
7. Literals are the_____ values used in a source code.
   a. Fixed b. Boolean c. String d. Float
8. _____ are those identifiers which are used to store values and they allow us to change their value during runtime
   a. Constant b. Variable c. List d. Tokens
9. A comment is basically a text that gives an _____ about the program code.
   a. Execution b. Compilation c. Explanation d. All of these
10. We can display program data to the console in Python with _____ function.
    a. input() b. print() c. output() d. show()

Ans: 1) a. IDLE 2) c. >>> 3) b. Integrated Development Environment
4) c. F5 5) d. Tokens 6) b. Identifiers
7) a. Fixed 8) b. Variable 9) c. Explanation 10) b. print()

B. Short Answer Type Questions:

Que 1: What do you know about Python?

Ans: Python is a popular programming language. It was developed by Guido Van Rossum. It was introduced in 1991. After that, it was developed by the Python Software Foundation. It is a general-purpose High-Level Programming language. The code produced in this language is small and flexible. Python is often used in the fields of Data Science, AI (Artificial Intelligence), and ML (Machine Learning).

Que 2: What is IDE?

Ans: IDE stands for Integrated Development Environment. It is a software that is dedicated to software development. IDEs integrate several tools for software development. These usually include the following tools:

- A Text Editor to handle Source Code
- Build, Execution, and Debugging Tools

Que 3: How can you view the list of Keywords using Python Shell? Write some examples of Keywords.

Ans: Keywords are also known as Reserve Words. To view the list of keywords using the Python shell, we can use the following Python statements:

```
>>> import keyword
>>> print(keyword.kwlist)
```

Some of examples of keywords are: True, False, if, elif, else, while, for etc.

Que 4: How will you declare variables in Python? Given Examples.

Ans: Variable are used to hold values in memory. There is no special command in Python to declare a variable. A variable comes into existence in memory automatically when we assign a value to it. The interpreter allocates memory to the variable according to the data type of the value assigned to it. For example:

```
x = 12
```

In this example, the variable 'x' is declared as an integer variable.

Que 5: Why print() function is used in Python programs?

Ans: The print() function is used to display output in Python programs. This function can be used to display program data on the console screen. By default, the print() function displays values separated by a single space. This function inserts a newline at the end after displaying its output.

Example:	Output:
print("Hello", "Students") print("How are you?")	Hello Students How are you?

C. Long Answer Type Questions:

Que 1: Define Tokens? Explain various types of tokens used in Python.

Ans: Every program is made up of different types of tokens. These tokens are like words and punctuation marks in the English language. They are the smallest individual elements in a program. The tokens used in Python programs are described below:

- **Keywords:** These are the Reserve Words.
- **Identifiers:** These are the names given to program elements, such as variables, functions etc.
- **Literals:** These are the fixed values used in the Source Code.
- **Operators:** These tokens are used to perform operations in the expressions.
- **Delimiters:** These are special characters that play specific roles (grouping, punctuation, etc.) in Python.

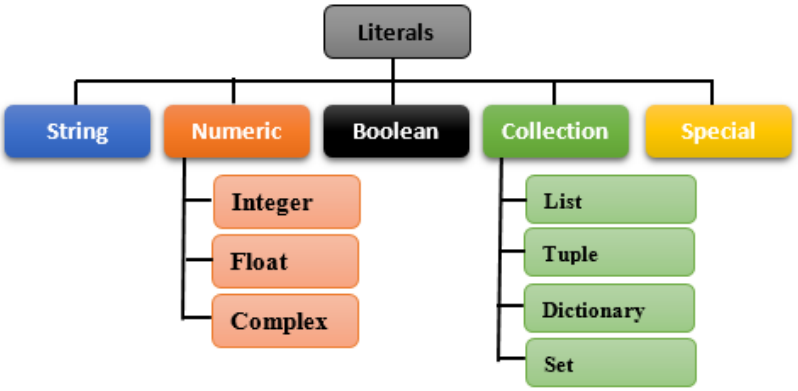
Que 2: What are Identifiers? Write their naming rules.

Ans: The names given to program elements such as variables, functions, etc. are called identifiers. To define the names of elements in a program, we have to use the following naming rules:

- Identifiers must be made up of a combination of lowercase (a-z) or uppercase (A-Z) alphabets, digits (0-9) or underscore (_).
- Identifiers cannot start with a digit.
- No keyword can be used as an identifier.
- No symbol or special character other than underscore (_) can be used in identifiers.
- Identifiers can be of any length; there is no restriction on the length of identifiers.
- Python is a case sensitive language. Therefore, the case of the alphabet is important in naming identifiers. For example: roll and ROLL are two different identifiers.
- Whitespaces cannot be used in an identifier.

Que 3: What are Literals? Draw a chart to represents the different types of literals used in Python.

Ans: Literals are fixed values that are used in the source code of a program. These values are usually assigned to program elements, such as variables, etc. The different types of literals used in Python are shown in the chart shown below:



Que 4: What are Comments? Write the different ways of writing comments in Python.

Ans: Comments are the integral part of a program. A comment in the program is a text that explains the code written in the program. The compiler and interpreter ignore these comments and do not execute them. They make the code easier to understand. There are mainly two ways to write comments in Python programs:

- **Single Line Comments:** These comments are written in a single line. For Example:

  # This is an example of a single comment

- **Multiline or Block Comments:** These comments are written in more than one line. For Example:

  """This is a multiline
  comment."""

Chapter-3rd
Data Types, Operators & Expressions in Python

A. Multiple Choice Questions:

1. Which of the following program element is used to hold value in memory?
   a) Variable b) Comments c) Operators d) All of above
2. Which of the following is not a Standard Numeric Data type in Python?
   a) Integer b) Floating c) Boolean d) Complex
3. Which of the following represents the Mapping Data type in Python?
   a) List b) Dictionary c) Tuple d) Set
4. The _____ keyword is used to define a null value, or no value in Python?
   a) Nothing b) Null c) Zero d) None
5. The _____ keyword is used to represent the True/False value in Python.
   a) bool b) boolean c) Boolean d) None
6. For Creating a list in Python, we write data items in _____.
   a) Parenthesis b) Square brackets c) Curley Brackets d) Angular Brackets
7. _____ in python are used to represent Unicode character values.
   a) String b) Tuple c) List d) Set
8. _____ types are those types whose contents are allowed to be changed after the creation.
   a) Mutable b) Immutable c) None d) Mapping
9. Which of the following is not an Arithmetic Operator in Python?
   a) / b) // c) ** d) ++
10. Which of the following function(s) is used for type conversion?
    a) int() b) float() c) str() d) All of above

Ans: 1) a) Variable 2) c) Boolean 3) b) Dictionary 4) d) None
5) a) bool 6) b) Square Brackets 7) a) String 8) a) Mutable
9) d) ++ 10) d) All of above

B. Write True or False for the following statements:

1. Symbol % represents modulus Operator which is used to get the remainder value after division of two numbers.
2. Relational operators return either True or False value after comparison.
3. Operators are the special symbols which are used to perform common operations on operands.
4. A Set is an unordered collection of comma-separated values in the square brackets.
5. A sequence is an ordered collection of similar or different data-items.

Ans: 1) True 2) True 3) True 4) False 5) True

C. Short Answer Type Questions:

Que 1: What are floating point numbers. Give Examples

Ans: Floating point numbers are also known as Real Numbers. These numbers are written with a decimal point. Decimal Point divides the real number into two parts: Integer and Fractional parts. For example: 56.5, +69.63, 0.56, etc. The maximum value that a floating-point variable can hold is approximately $1.8x10^{308}$. If the inputted value exceeds this maximum value ($1.8x10^{308}$), the Python program will display error inf (infinity).

Que 2: What do you know about the Boolean Data Type of Python?

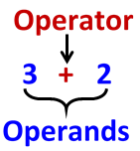
Ans: Boolean data type is used to represent the truth value of Expression. For example, the expression 5 <= 10 is True, while the expression 5 > 10 is False. Boolean data type can have only two possible values: True and False. No other values are possible for the Boolean type. Python's bool() function can be used to convert a given value to a Boolean value.

Que 3: What are the Sequence Data Types in Python? Write their names.

Ans: A Sequence is an ordered collection of values that can be of same type or different types. There are several Sequence data types in Python. The following are the commonly used Sequence types in Python:

- List
- Tuple
- Range
- String

Que 4: Explain Operands with suitable examples.



Ans: Operands are the values on which operators perform their operations. A single operator cannot do anything by itself. Any Operator requires one or more operands to perform its operation. In the given example, the special symbol + is an operator that is performing its operation on the values 3 and 2. These values (3 and 2) are called Operands.

Que 5: What are Arithmetic Operators? Give Examples

Ans: Arithmetic operators are symbols that are used to perform arithmetic (mathematical) operations on numeric values. The table below shows examples of arithmetic operators:

Symbol	Operator	Example
+	Addition	5 + 10 = 15
-	Subtraction	5 – 10 = -5
*	Multiplication	5 * 10 = 50
/	Real Division	19 / 5 = 3.8
//	Integer Division	19 // 5 = 4
%	Modulus	19 % 5 = 4
**	Exponent	5 ** 2 = 25

Que 6: What is Expression?

Ans: An Expression is like a mathematical formula. It is a valid combination of Operators and Operands. Expression returns a value after performing operations on the operands. This returned value is called the result of the expression. For example: 3+2 is an Expression which is a valid combination of operators and operands. Using this expression, we will get the value 5 after performing the addition operation on the values (3 and 2).

D. Long Answer Type Questions:

Que 1: What do you mean by Data Types? Draw a chart representing the various common standard data-types used in Python.

Ans: Data type refers to the type of data to be stored in the variables. In Python, we do not need to mention the data type of variables while declaring them. The interpreter automatically defines the data type of variable according to the type of the value assigned to it. The Built-In Data Types available in Python are also known as Standard Data Types. These data types can be shown using the following chart:

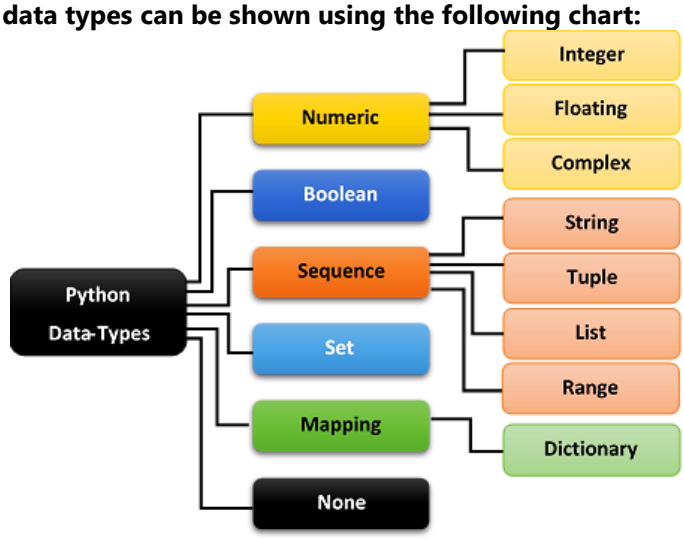


Fig: Commonly used Standard Data-Types in Python

Que 2: What is the difference between Mutable and Immutable Types?

Ans: The differences between mutable and immutable types are given below:

S.N.	Mutable Types	Immutable Types
1	These are those types whose contents are allowed to be changed after creation.	These are those types whose contents are not allowed to be changed after creation.
2	It is possible to add, delete, insert, and rearrange data items in these types.	It is not possible to add, delete, insert, and rearrange data items in these types.
3	Examples: List and Dictionary	Examples: Numbers, Strings and Tuples

Que 3: What are Operators? Explain any two types of operators used in Python.

Ans: Operators are special symbols that are used to perform simple operations on operands. Python supports many different types of operators. Arithmetic and Relational operators of Python are described below:

- **Arithmetic Operators: These operators are used to perform arithmetic (mathematical) operations on numeric values. For examples:**

Symbol	Operator	Example
+	Addition	5 + 10 = 15
-	Subtraction	5 – 10 = -5
*	Multiplication	5 * 10 = 50
/	Real Division	19 / 5 = 3.8
//	Integer Division	19 // 5 = 4
%	Modulus	19 % 5 = 4
**	Exponent	5 ** 2 = 25

- **Relational (Comparison) Operators: These operators are used to compare values. After comparing, these operators return either True or False value. For example:**

Symbol	Operator	Example
==	Equals to	4 == 5 is False
!=	Not Equal to	4 != 5 is true
>	Greater Than	4 > 5 is False
<	Less Than	4 < 5 is true
>=	Greater than or Equals to	4 >= 5 is False
<=	Less than or Equals to	4 <= 5 is true

Chapter 4th
Control Statements

A. Multiple Choice Questions:

1. If we have to select one from two or more options during programming, then we will use which of the following option?
   a) Simple if b) if elif else c) Sequential Execution d) None of these
2. How will you define the logical expression for the following condition?
   "Marks are greater than or equal to 60 but less than 80"
   a) if marks>=80 and marks<60: b) if marks>60 and marks<=80:
   c) if marks>=60 and marks<=80: d) if marks>=60 and marks<80:
3. When we use if else condition within another if else condition, it is called?
   a) else if Ladder b) Simple if else c) Nested if else d) None of these
4. Conditional Flow Control is also known as _____
   a) Branching Statement b) Decision Making Statement
   c) Looping Statement d) Both a and b
5. Looping Statement is also known as _____
   a) Iterative Statement b) Conditional Statement
   c) Sequential Statement d) All of Above
6. If we have to repeat the execution of one or more statements, we can use _____
   a) Iterative Statement b) Conditional Statement
   c) Skipping Statement d) None of these
7. How will you define the range function for generating following sequence ("2,4,6,8,10,12,14,16")?
   a) range(2,16) b) range(2,17) c) range(2,17,2) d) range(2,16,2)
8. When we use a loop within another loop, it is called?
   a) Infinite Loop b) Nested Loop c) for while Loop d) None of these
9. A loop that never ends is called a:
   a) Continuous Loop b) Infinite Loop c) Circular Loop d) None of these
10. The _____ statement in Python brings control out of the loop.
    a) break b) back c) pass d) continue
11. Which of the following loop will continue infinitely?
    a) while 0: b) while 1: c) while :1: d) while False:

Ans: 1) b) if elif else 2) d) if marks>=60 and marks<80: 3) c) Nested if else
4) a) Branching Statement 5) a) Iterative Statement 6) a) Iterative Statement
7) c) range(2,17,2) 8) b) Nested Loop 9) b) Infinite Loop
10) a) break 11) b) while 1:

Chapter 5th
Basic Concepts of Database Management System

A. Multiple Choice Questions:

1. **Which Network Model is designed in the form of Plex Structure?**
   a) Hierarchical Model b) Network Model c) Relational Model d) None of these
2. **Which of the following represents the name of a Column in a table?**
   a) Relational b) Attribute c) Degree d) tuple
3. **Which of the following is not a component of Database?**
   a) Hardware b) Software c) Network d) User
4. **Who is responsible to administrate the database?**
   a) End User b) System Programmer c) Database Administrator d) Data Modelers
5. **An organized or classified DATA is known as:**
   a) Information b) Table c) Result d) None of these

Ans: 1) b) Network Model 2) b) Attribute 3) c) Network
4) c) Database Administrator 5) a) Information

B. Fill in the Blanks:

1. _____ systems were traditional systems for the storage of facts in a manual way.
2. _____ can be referred as a logical structure of the Database.
3. The total no of records present in a table is called _____of a relation.
4. The _____ key refers to identify all the records uniquely in a particular column.
5. _____ is a standardized language which provides commands to define the storage groups, different structures and objects in a database.

Ans: 1) File-Based Data Storage 2) Data Modal 3) Cardinality
4) Primary 5) DDL

C. Write the Full Forms:

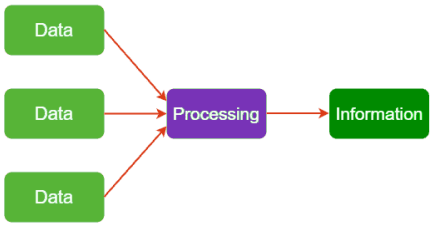
1. **RDBMS** Relational Database Management System
2. **DML** Data Manipulation Language
3. **DDL** Data Definition Language
4. **DBMS** Database Management System
5. **DBA** Database Administrator
6. **SQL** Structure Query Language

D. Short Answer Type Questions:

Que 1: Define Data and Information.

Ans: The definition of data and information is given below:

- **Data:** Data refers to a collection of facts stored in a database. Data is considered as the raw material to produce information in database.
- **Information:** Information is obtained after processing the data. It is used to make decisions or to formulate new policies. Information depends entirely on the data.



Que 2: What do you mean by DBMS?

Ans: DBMS stands for Database Management System. It is a software that acts as an interface between the Database and the End-User. Using DBMS, users can define a database for managing data. With the help of DBMS, the user can store data in database, retrieve stored data, update it and can delete unnecessary data from database. Organizations use DBMS software to manage their data.

Que 3: Explain the hardware component of the database.

Ans: Hardware is an important component of a database system. This part refers to all the physical devices of the database system. The most important and essential part of this component is the computer. It can be a micro-computer, mini-computer or mainframe-computer. Apart from the computer system, input, output, storage and other devices such as: modem, printer, hard disk etc. are also important parts of the hardware component of a database.

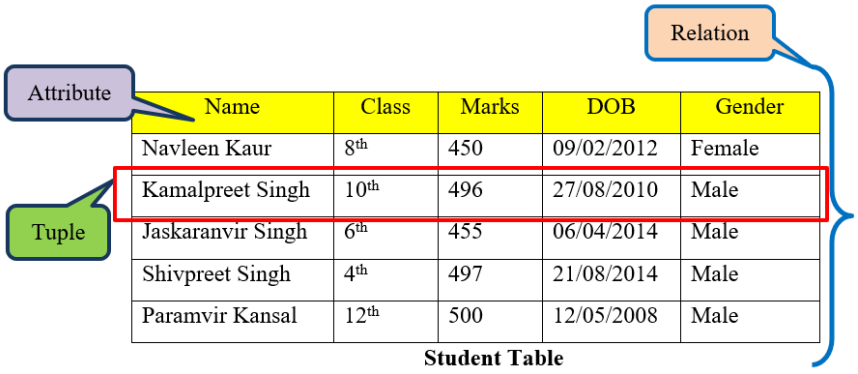
Que 4: Write a short note on Data Models.

Ans: The logical structure of a database is called Data Model. A Data Model represents the objects, events, and associations that exist in the 'real world'. In simple terms, we can say that it represents the organization of data. A Data Model consists of three main components:

1. **Structural Part**
2. **Manipulative Part**
3. **Set of Integrity Rules**

Que 5: Define Relation in a database?

Ans: A relation represents a table in which values are stored in the form of rows and columns. In a Relational Database Management System (RDBMS), data is organized into tables/relations. A row of the table represents a collection of related data values, called a Tuple. Each column of the table/relation is given a unique name, which is called an Attribute. An example of a table/relation of a database is shown below:



Name	Class	Marks	DOB	Gender
Navleen Kaur	8th	450	09/02/2012	Female
Kamalpreet Singh	10th	496	27/08/2010	Male
Jaskaranvir Singh	6th	455	06/04/2014	Male
Shivpreet Singh	4th	497	21/08/2014	Male
Paramvir Kansal	12th	500	12/05/2008	Male

Student Table

Que 6: What do you mean by degree and cardinality of relations?

Ans: The terms degree and cardinality are used in relational database management systems:

- **Degree: The total number of columns (attributes) present in a relation/table is called the degree of that table. The degree of a table is represented by d(R).**
- **Cardinality: The total number of rows (tuples) present in a relation/table is called the cardinality of that table. The cardinality of a table is represented by |R|.**

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Cardinality

Degree

For example: The degree of the above table/relation is 5 and the cardinality is 4.

Que 7: Define the Primary Key of a database.

Ans: Primary key is an important key in Relational Database Management System (RDBMS). It is used to identify records uniquely in a table. There can be only one primary key in a table. All the values of the primary key column should be unique, there should be no repetition in them. For example, we can specify RollNo as the primary key in the Student table.

E. Long Answer Type Questions:

Que 1: What are the components of a Database? Explain in detail.

Ans: A database system is made up of many different components. These components are described below:

1. **Hardware: This component refers to the set of all physical components of a database system. It includes mainly the computer system and storage devices.**
2. **Software: This component describes the software used in a database system. It includes the Operating System, DBMS software, Application Programs, and Utility Software.**
3. **Users: This component represents the different users of database. For example: DBA and End Users.**
4. **Procedures: These are the set of instructions and rules for designing and use of a database.**
5. **Data: It represents the collection of facts stored in the database. It is the core of the database.**

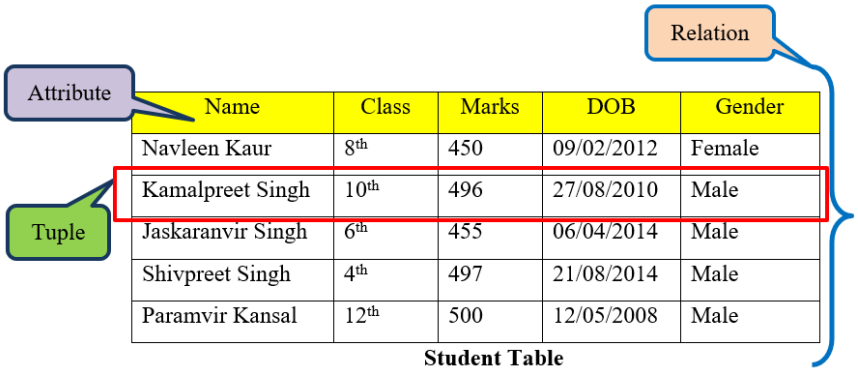
Que 2: Define the characteristics of a Database.

Ans: Databases have many characteristics. Some of the important characteristics are described below:

1. **Minimal Redundancy:** Duplication of data can be avoided using a centralized database.
2. **Inconsistency can be avoided:** In traditional file systems, data is duplicated in different files. When this data is changed in one file but not updated in other files, the inconsistency in data arises. Because data duplication is very minimal in databases, so inconsistency can be avoided in them.
3. **Data Sharing:** Data in a database can be easily shared among different users and applications.
4. **Search Capability:** Data can be quickly searched in the database whenever required.
5. **Privacy and Security:** Data privacy and security can be ensured through authentication methods.
6. **Easy Backup/Recovery:** It is very easy to take backups and recovery of data in databases whenever required.

Que 3: What is Relational Data Model of a database? Explain in detail.

Ans: The relational model uses tables to represent the relationships between different pieces of data. In a relational database, a table is also called a Relation. A table is a set of rows and columns. Each column has a unique name, called an Attribute. Each row in a table represents a collection of related data values. These rows are also called Tuples. For example: The following figure shows an example of a table named - Student



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Navleen Kaur	8th	450	09/02/2012	Female
Kamalpreet Singh	10th	496	27/08/2010	Male
Jaskaranvir Singh	6th	455	06/04/2014	Male
Shivpreet Singh	4th	497	21/08/2014	Male
Paramvir Kansal	12th	500	12/05/2008	Male

Student Table

The total number of columns (attributes) present in a relation/table is called the Degree of that table, while the total number of rows (tuples) is called the Cardinality of that table. The degree of a table is denoted by d(R) and the cardinality by |R|. The degree of the above table is 4 while the cardinality is 5.

Que 4: What is SQL? Explain sub-languages of SQL.

Ans: SQL stands for Structured Query Language. This language is very easy to learn because it uses common English keywords in SQL commands. SQL was introduced in 1970 based on the Relational Data Model. We can use SQL commands to perform various operations on the database.

Sub-Languages of SQL: Commands of SQL language can be divided into the following three main sub-languages:

- **Data Definition Language (DDL):** The commands in this sub-language are used to define various structures and other objects of database, such as tables, indexes, etc. Example commands: CREATE, ALTER, DROP etc.
- **Data Manipulation Language (DML):** The commands of this sub-language are used to perform various operations on data stored in the database, such as: insertion, updation or deletion of data. Example commands: INSERT, DELETE, UPDATE, SELECT etc.
- **Data Control Language (DCL):** Commands in this sub-language are used to control the access of data stored in the database. Example commands: GRANT, REVOKE, etc.

Chapter 6th
Computer System Maintenance

A. Multiple Choice Questions:

1. Software that plays a supporting role for users and developers, are called _____
   a) Operating System b) Utility Program c) Protection Tools d) Developer Tools
2. _____ picks up all the scattered pieces of a data across our hard drive and puts them back together again to improve the performance of a computer system.
   a) Fragmentation b) Disk Cleanup c) Defragmentation d) None of these
3. _____ is a System software which acts as an interface between the user and computer hardware
   a) Utility Program b) Antivirus Program c) Protection System d) Operating System
4. Which of the following mode is a diagnostic mode of a computer operating system?
   a) Developer Mode b) Safe Mode c) Operating Mode d) Diagnostic Mode
5. Which of the following utility can be used to protect our system from malwares?
   a) Compression Tools b) Antivirus Tools c) Disk Maintenance Tools d) None of these
6. A _____ includes bug fixes, and other small improvements.
   a) Software Update b) Software Upgrade c) Disk Management Tool d) All of Above
7. A _____ is a security system that does not allow unauthorized access on our system while we are connected to a network.
   a) Encryption b) Firewall c) Antivirus d) All of Above

Ans: 1) b) Utility Program 2) c) Defragmentation 3) d) Operating System 4) b) Safe Mode
5) b) Antivirus Tools 6) a) Software Update 7) b) Firewall

B. Write the full forms:

1. PnP — Plug and Play
2. USB — Universal Serial Bus
3. PCB — Printed Circuit Board
4. DVI — Digital Video Interface
5. OS — Operating System
6. VGA — Visual Graphics Adapter

C. Short Answer Type Questions:

Que 1: What do you mean by Computer Maintenance?

Ans: The various activities of maintaining a computer system and its components are called Computer Maintenance. These activities help us to keep our computer system and its components in a good working condition for a long time. For maintenance, we need to take care of both the hardware and software components of the computer system. Hardware maintenance involves taking care of the physical components of the computer, such as the keyboard, mouse, etc., while the software maintenance involves the tasks that help the software to work smoothly.

Que 2: Write any four techniques to improve the performance of computer system?

Ans: To improve the performance of the computer system, we should use the following tools and techniques:

- Disable unnecessary start-up programs.
- Delete temporary files.
- Uninstall apps that we are no longer using.
- Delete unnecessary files by running the Disk Clean-up tool.
- Use Disk Defragmentation tool.

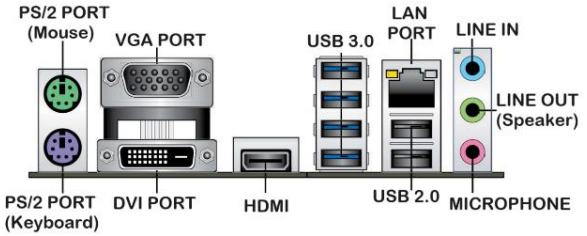
Que 3: What is Booting?

Ans: When we press the power button of the computer system, its operating system starts loading into the main memory (RAM). This process of starting the computer system is called Booting. The booting process takes some time to complete. When the booting process completes, our computer system gets ready to work.

Que 4: Write the name of different types of Ports available in the modern computers?

Ans: Port is an interface through which we connect an external device with the computer system. Different types of ports are available on the system unit to connect different types of devices. The names of some of the common ports are as follows:

- PS/2 Port
- USB Port
- VGA Port
- HDMI Port
- DVI Port
- Ethernet Port



Que 5: How will you add new fonts in the Computer System?

Ans: We can install fonts in the computer system using the following steps:

- Download the new font from the internet.
- Open the folder in which we have downloaded the font.
- Right-click on the font file.
- Click on the Install option that appears in the pop-up menu.

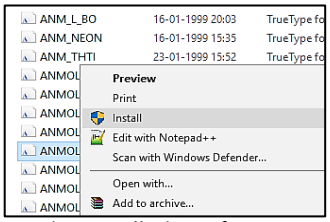


Fig: Installation of Fonts

Que 6: What are Utility Programs?

Ans: Utility programs are the System Software. These software programs help the Operating System to organize, maintain, and optimize the functioning of a computer system. Some of the common tasks performed by utility software are: virus detection and removal, data backup, file compression, disk management, disk cleanup, disk defragmentation, file management, etc.

Que 7: What do you mean by Device Driver?

Ans: A device driver is a software that enables communication between a device and a computer system. Due to these device drivers, we can use a device after connecting it with the computer. Whenever we connect any new device to the computer system, it tries to install the drivers for that device. The Windows operating system can automatically install the drivers for some of the devices. But for some external devices, we need to install the drivers manually.

D. Long Answer Type Questions:

Que 1: What is Hardware Maintenance? Explain some guidelines for maintaining hardware?

Ans: Hardware maintenance refers to maintaining the physical components of computer system, such as keyboard, mouse, hard drive, etc. If we are taking good care of our PC, it will not crash and thus it prevents the loss of our data.

Guidelines for Maintaining Hardware:

1. Remove dust and dirt from the hardware components using a blower, soft brush or vacuum cleaner.
2. The computer should be covered after using it.
3. Keep cleaning the dirt from the mouse surface and always use a mouse pad.
4. Protect hardware components from liquids.
5. Protect the computer and its components from direct sunlight and heat sources, etc.
6. The computer should be connected with a reliable stabilizer.
7. The power cable should be of good quality.

Que 2: What are Ports? Explain any two ports in detail?

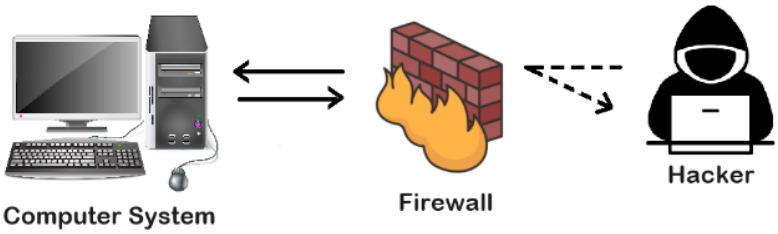
Ans: Port is an interface through which we connect external device with the computer system. Different types of ports are available on the system unit to connect devices with computer system. Some of the common ports are as explained below:

- **PS/2 Port:** This port is used for older keyboards and mouse. The color-code of mouse port is green and the keyboard port is magenta. Color-codes are used for identification.
- **Universal Serial Bus (USB) Port:** This is a very popular and versatile type of port. It can connect all types of external USB devices like external hard disks, printers, scanners, mouse, keyboards, etc. This port was introduced in 1997. Most computers provide USB ports.
- **Visual Graphics Adapter (VGA) Port:** It is also called the Monitor port. It is used to connect a CRT monitor with the computer.

Que 3: What do you mean by PC Security? Explain any two techniques to secure your PC.

Ans: PC security is also known as IT security. It is a protection system that protects data and information stored in a computer from misuse and theft. Computer security ensures that our system and data are protected from various threats such as: viruses, hacking and misuse. Following techniques can be used to secure a PC:

- **Antivirus Software: Computer virus is a malicious software that corrupts our data and other programs. Antivirus software searches for such viruses (malware) from our system and eliminates them and keeps our computer safe. Examples of antivirus software: Norton, Avira Antivirus etc.**
- **Firewall: This security system monitors and controls the data coming over the network based on security constraints. If any outsider (hacker) on the network tries to access our computer in an unauthorized way, then he is immediately blocked. Example software: Windows Defender Firewall**



Que 4: Differentiate Update and Upgrade?

Ans: Update and upgrade are two different ways of making changes to an application or operating system. The main differences between them are as follows:

S.N.	Software Update	Software Upgrade
1	A software update is a patch that includes bug fixes and other minor improvements.	A software upgrade changes an old version to a new version.
2	The original structure of the software is not affected after updating it.	After upgrading the software, its basic structure may get affected.
3	An update mostly includes options related to fixing existing bugs or security patches etc.	An upgrade mostly involves significant changes to the GUI interface and a variety of new features.
4	The software update is small in size and takes a few minutes to apply.	Its size can be up to several gigabytes and it can take a long time to complete installation.
5	Software updates are often free and are essential to apply.	Software upgrades are often expensive and not necessary to implement.
6	Example: Applying security patches to Windows 10 is called a software update.	Example: Upgrading from Windows 10 to Windows 11 is called a software upgrade.

Chapter 7th
Cyber Security and Ethics

A. Multiple Choice Questions:

1. Information Technology Act, 2000 (India) comes into existence in INDIA on
   a) 17th October 2000 b) 27th November 2003 c) 1st January 2006 d) 17th October 2009
2. How E-waste results in data theft?
   a) By Email Forwarding b) By Replacing Old Electronic Device in Exchange without clearing data.
   c) By Sharing Data d) By using Wi-Fi Network
3. Plagiarism means _____
   a) An Act of presenting another person's work or idea as your own
   b) A disease that affects humans and other mammals
   c) A contagious bacterial disease characterized by fever
   d) None of Above
4. Which of the following is not a part of CIA Triad?
   a) Confidentiality b) Integrity c) Availability d) Phishing
5. On which toll free number a complaint can be registered with Punjab Police Cyber Crime Division in case of any online fraud?
   a) 1911 b) 1930 c) 1947 d) 1912
6. Which Act in India focuses on Cyber Crime?
   a) Banking Regulation Act 1949 b) IT Act 2000
   c) Indian Penal Code 1860 d) CrPC 1973

Ans: 1) a) 17 October 2000 2) b) By Replacing Old Electronic Device in Exchange without clearing data
3) a) An Act of presenting another person's work or idea as your own
4) d) Phishing 5) b) 1930 6) b) IT Act 2000

B. Fill in the Blanks:

1. Any offense committed against a person or groups of people using digital gadget is known as _____.
2. _____ refers to the code of responsible behavior on the internet.
3. E-waste management using landfills pollute _____.
4. _____ is an act of secretly or stealthily listening to the private conversation or communications of others without their consent in order to gather some important or secret information.
5. CIA triad stands for _____, Integrity, and Availability.

Ans: 1) Cyber Crime 2) Cyber Ethics 3) underground water and soil
4) Eavesdropping 5) Confidentiality

C. Write True or False for the following Statements:

1. CIA triad stands for Confidentiality, Integrity, and Availability.
2. IT Act in India came into force in the year 1995.
3. E-waste is good for human health.
4. Cyber Ethics ensure that users understand their responsibilities for conducting themselves online.
5. Hacking is used to expose vulnerabilities in systems too.
6. Spying is an act of keeping a secret watch on various activities of opponents for intelligence purposes.

Ans: 1) True 2) False 3) False 4) True 5) True 6) True

D. Short Answer Type Questions:

Que 1: Describe Cyber Crime.

Ans: Cybercrimes include illegal activities related with the use of technology, for example: data theft, online fraud, forgery, etc. To commit these crimes, criminals often use a computer system or a portable computing device and a network. The purpose of cybercrimes is to harm an individual, security of a country or financial assets of someone. Electronic devices can easily become victims of cybercrime.

Que 2: What do you mean by Hacking?

Ans: Hacking is often referred to as an activity related to cybercrime. Through hacking, cybercriminals often try to access our computer systems in an unauthorized manner. Its main objective may be the manipulate of valuable information or to misuse electronic devices such as computers, smartphones, etc. The person who does hacking is called a Hacker.

Que 3: Define Phishing with example.

Ans: Phishing is an activity related to cybercrime. In this crime, a person is tricked into revealing personal information such as credit card numbers, bank details or passwords by offering them false offers. This crime is often performed to steal our money or our identity. For Phishing, cybercriminals send us messages in the form of links that contains false offers via Emails or SMS.

Que 4: Explain CIA Triad.

Ans: CIA stands for Confidentiality, Integrity, and Availability. The CIA triad represents a model that forms the basis for the development of security systems. If an organization's data meets these three criteria, then that organization is considered to have a strong security profile:

1. **Confidentiality:** Confidentiality limits data access. It determines what information we want to keep private.
2. **Integrity:** Integrity determines whether the data or information in our system is completely accurate.
3. **Availability:** Availability determines that data is available only to those who need it.

Que 5: What is Cyberbullying?

Ans: Cyberbullying is a cyber-threat in which someone uses technology to harass, threaten, embarrass, or target another person. Online threats, aggressive texts, tweets, posts, or messages are all examples of cyberbullying. Similarly, posting personal information, pictures, or videos designed to hurt or embarrass someone is also called cyberbullying.

Que 6: What do you mean by Plagiarism?

Ans: Plagiarism is also known as Piracy. Plagiarism means presenting the work or ideas of another person as one's own. In this type of activity, individuals download music, movies, games, and software from the internet in violation of copyright. These activities fall under the category of cybercrime. Many laws have been enacted to prevent people from committing Plagiarism/piracy.

Que 7: Explain Identity Theft.

Ans: Identity theft is a type of cybercrime. This crime occurs when someone uses our personal or financial information without our permission to commit fraud or other crimes. This personal or financial information can include our name, address, credit card number etc. These sensitive details can be used for various illegal purposes, such as applying for loans in our name without our knowledge, making online purchases, or accessing our financial data.

Que 8: Describe the various harmful effects of E-Waste.

Ans: E-Waste usually contains Mercury, Lithium, Lead and Barium etc. Therefore, when E-Waste is not managed properly, it causes harm to the environment and people. E-Waste can affect the environment in various aspects, which are described below:

1. **Air Pollution** Improper management of E-Waste causes air pollution, which harms flora and fauna.
2. **Soil Pollution:** When E-Waste is disposed-of openly in the ground, it contaminates that soil.
3. **Water Pollution:** When E-Waste is disposed of, it eventually makes its way into water bodies like ponds, rivers, canals etc., causing water pollution.
4. **Bad Effects on Human:** The toxic substances in E-Waste have harmful effects on human health.

E. Long Answer Type Questions:

Que 1: What is Cyber Crime? Describe various types of Cyber Crime.

Ans: Cybercrimes involve illegal activities using technology, for example: data theft, online fraud, forgery, etc. Cyber Criminals often use computer systems or any portable computing device and a network to commit these crimes. The purpose of cybercrimes is to harm an individual, the security of a country, or financial assets of someone. Cybercrimes can be classified into several types:

1. **Crime against Persons:** This category of cybercrimes is related to crimes against individuals. Cybercrimes committed against individuals include various crimes such as identity theft, cyberbullying, cyberstalking, piracy, phishing etc.
2. **Crime against Government:** This category of cybercrimes is related to crimes against the government. Cyberterrorism is a separate type of crime in this category.
3. **Crime against Property:** This category of cybercrimes relates to crimes against all forms of property.

Que 2: Explain Cyber Safety. What are the preventive measures to tackle Cyber Crime?

Ans: Cyber security is mainly concerned with protecting our computer systems, networks and data from cyber-attacks. These cyber-attacks often focus on obtaining our personal and financial information, causing us financial losses, etc. Implementation of effective cyber security has become a challenge today. Some of the preventive measures to deal with cybercrimes/attacks are as follows:

Preventive measures to tackle Cyber Crimes:

1. **Use a secure internet connection.**
2. **Protect your devices from malicious software and attackers.**
3. **Stay away from suspicious messages and sites.**
4. **Use strong passwords and change them periodically.**
5. **Regularly check your online banking accounts and credit scores for suspicious activities.**
6. **Avoid sharing your personal information and daily routines on social media.**

Que 3: Define Cyber Ethics. What are the principles of Cyber Ethics?

Ans: Cyber Ethics is also known as Digital Ethics or Internet Ethics. It refers to a set of moral values that govern our behavior in the online environment. Cyber Ethics helps create a safe online environment. Responsible citizens help make cyberspace a safe place. Governments and organizations have implemented regulations and policies to promote Cyber Ethics.

Principles of Cyber Ethics:

- **Privacy: This principle reflects the responsibility of individuals to protect their personal information.**
- **Accuracy: Users should verify information before sharing it, and avoid spreading misinformation.**
- **Property: Respect copyright laws and avoid plagiarism.**
- **Intellectual Behavior: Avoid cyberbullying and abuse while online. We should respect the feelings of others when communicating online.**

Que 4: What do you mean by E-Waste? Explain various methods of disposing E-Waste.

Fig: E-Waste

Ans: E-Waste means Electronic Waste. E-Waste refers to electrical or electronic devices that have been discarded or are no longer in use. Some common e-waste items are: old damaged mobile phones, computers, laptops, hard drives, fans, CD/DVDs, printers, etc. E-Waste is a serious issue for our environment. Therefore, e-waste disposal should be done in a systematic manner.

Methods of disposing E-Waste:

1. **Landfills: This is the most commonly used method of disposing of e-waste. In this method, e-waste is buried in a hole dug in the ground.**
2. **Incineration: This is a commonly used method for disposing of e-waste. In this method, e-waste is burned in special furnaces at high temperatures.**
3. **Acid Bath: In this method, e-waste is destroyed by immersing it in a strong acid solution, which separates the metals from the e-waste. These metals are reused to make other products.**
4. **Mechanical Recycling: Using this method, the metals present in the e-waste are separated from the e-waste using a PCB recycling machine. Doing so does not harm the environment either.**