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|  | **Chapter-1**  **Number System**  Date  Page No. |
|  | 1. Which of the following is the smallest number in the hexadecimal system? 2. **0** ✅ B) 1 C) A D) F 3. What is the binary equivalent of the decimal number 15 ?   A) 0111 **B) 1111** ✅ C) 0101 D) 011   1. Which number system is most commonly used in everyday arithmetic?   A) Binary **B) Decimal** ✅ C) Hexadecimal D) Octal   1. Radix of Hexadecimal number system is   A) 2 B) 5 C) 8 **D) 16** ✅   1. (38CB) 16 is an example of which number system is?   A) Binary B) Decimal **C) Hexadecimal** ✅ D) Octal  A: Multiple Choice Questions: |
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|  | B : Write True or False for the following statements: |
|  | 1. The Binary Number 1111 represents the decimal number 15. **(True) ✅** 2. The Hexadecimal system use 2 as its base/radix. **(False) ❌** 3. Octal word comes from Latin word Oct which means 8. **(True) ✅** 4. The Binary Number System can represent any number using digits only 0 and 1. (**True) ✅** 5. In the Octal Number System, the digit ‘9’ is valid. (**False) ❌** 6. In the Hexadecimal System, the letter ‘B’ represents the Decimal value 12. (**False)** **❌** 7. Roman Number System is and example of Positional Number System. (**False)** **❌** |
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|  | **C : Short Answer Type Questions:** |
|  | Q1. What is the Number System? Write the name of basic categories of number System?  Ans: A number system is a method of representing numbers, providing a structured way to express quantities and perform arithmetic operations. It defines the symbols used and the rules for combining them. Each number system follows a specific set of rules for writing and calculating values.  There are two basic categories of number systems: **non-positional** and **positional**.   1. In a non-positional number system, the value of a symbol does not depend on its position (e.g., Roman numerals). 2. In a positional number system, the position of a digit affects its value, and this system is widely used in modern mathematics and computing. Common types of positional number systems include the **Decimal system** (base 10), **Binary system** (base 2), **Octal system** (base 8), and **Hexadecimal system** (base 16). These systems are especially important in fields like digital electronics and computer science, where binary and hexadecimal systems play a central role. |
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|  | **Chapter-1**  **Number System**  Date  Page No. |
|  | Q2. Explain Decimal Number System?  Ans: The **Decimal Number System** is the standard system used for representing numbers and is also known as the **Base-10 Number System**. The decimal system has a **base of 10**, meaning it uses **10 digits**: **0, 1, 2, 3, 4, 5, 6, 7, 8, 9** |
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|  | Q3. What is binary Number System? Who is the inventor of this number?  Ans: The **Binary Number System** is a number system that uses only **two digits**: **0 and 1**.  It is also known as the **Base-2** number system.   1. Each binary digit is called a **bit**. 2. It is mainly used in **computers and digital systems** because electronic devices can easily represent two states: **ON (1)** and **OFF (0)**. 3. Each place value in a binary number represents a power of 2.   **Example:**  The binary number **1011** represents:  **1×2³ + 0×2² + 1×2¹ + 1×2⁰ = 8 + 0 + 2 + 1 = 11 (in decimal)**  The binary number system was **formally developed by** the German mathematician and  philosopher **Gottfried Wilhelm Leibniz** in **1703**.  He published a paper titled *"Explication de l'Arithmétique Binaire"*, explaining how all  numbers can be represented using just 0s and 1s. |
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|  | Gottfried Wilhelm Leibniz: Who was the German philosopher ... |
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|  | Q 4. Explain Octal Number System?  Ans: The **Octal Number System** is a **base-8** number system that uses **eight digits**: **0, 1, 2, 3, 4, 5, 6, and 7**. Octal is **Positional System**, Like decimal and binary, the value of each digit depends on its position and the base. Octal is often used in **computing**, especially with **older systems** or **Unix file permissions**. **For Example:**  **Unix/Linux File Permissions**   * Each permission (read, write, execute) is represented by a bit. * Example:   + chmod 755 file.txt sets:     - Owner: read (4) + write (2) + execute (1) = **7**     - Group: read (4) + execute (1) = **5**     - Others: read (4) + execute (1) = **5** * Octal provides a **compact way** to represent binary permission flags. |
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|  | **Chapter-1**  **Number System**  Q5. Explain Hexadecimal Number System?  Ans: The **Hexadecimal Number System** is a **base-16** system that uses **16 symbols**: **0–9** (representing values 0 to 9) and **A–F** (representing values 10 to 15). Each digit in hexadecimal corresponds to **four binary bits**, making it very useful in computing.  **Practical Uses:**   1. **Memory Addresses**: Computers use hexadecimal to represent memory locations because it's shorter and more readable than binary. 2. **Color Codes in Web Design**: Colors in HTML/CSS are often defined using hexadecimal (e.g., #FF5733 = Red: FF, Green: 57, Blue: 33 )   Date  Page No. |
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|  | **D : Perform the following conversion of Number System** |
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|  | 1. (25) 10 = ( 11001 ) 2 =  ( 31 ) 8 = ( 19 ) 16   2 25 1 LSB 8 25 1 16 25 9  2 12 0 3 1  2 6 0  2 3 1  1 MSB |
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|  | 1. ( 10111) 2 = ( 23 ) 10 =  (27) 8 = (17) 16   1 0 1 1 1 0 1 0 **1 1 1** 0 0 0 1 **0 1 1 1**  24 23 22 21 20 22 21 20 22 21 20 23 22 21 20 23 22 21 20  16 8 4 2 1 4 2 1 4 2 1 8 4 2 1 8 4 2 1  1x16 0x8 1x4 1x2 1x1 0x4+ 1x2+0x1 **1x4 + 1x2 +1x1** 0x8+0x4+0x2+1x1 **0x8+1x4+1x2+1x1**  16 + 0 + 4 + 2 + 1  23 2 7 1 7 |
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|  | 1. (47) 8 = (39) 10 =  ( 100111 ) 2 = (27) 16   4 7 4 7 0 0 1 0 0 1 1 1  81 80  22 21 20 22 21 20 23 22 21 20 23 22 21 20  8 1 4 2 1 4 2 1 8 4 2 1 8 4 2 1  4x8 7x1 1x4+ 0x2+0x1 **1x4 + 1x2 +1x1** 0x8+0x4+1x2+0x1 **0x8+1x4+1x2+1x1**  32 + 7 =39 1 0 0 1 1 1 2 7 |
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|  | **Chapter-1**  **Number System**  Date  Page No. | | | | | | | | | | |
|  | 1. (A4) 16 = ( 164 ) 10 =  (1010 0100) 2 = (244) 8   A 4 A 4 0 1 0 1 0 0 1 0 0  161 160  23 22 21 20 23 22 21 20 22 21 20 22 21 20 22 21 20  16 1 8 4 2 1 8 4 2 1 4 2 1 4 2 1 4 2 1  10x16 4x1 1x8+0x4+1x2+0x1 **0x8+1x4+0x2+0x1** 0x4+ 1x2+0x1 1x4 + 0x2 +0x1 1x4 + 0x2 +0x1  160 + 4 =164 1010 0100 2 4 4 | | | | | | | | | | |
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| **Activity** |  | | | | | | | | | | |
|  | **1.1 Complete the Following Table** | | | | | | | | | | |
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|  | **Decimal** | | | **Binary** | **Hexadecimal** | | **Octal** | |  | |
|  | 0 | | | 0 0 0 0 | 0 | | 0 | |  | |
|  | 1 | | | 0 0 0 1 | 1 | | 1 | |  | |
|  | 2 | | | 0 0 1 0 | 2 | | 2 | |  | |
|  | 3 | | | 0 0 1 1 | 3 | | 3 | |  | |
|  | 4 | | | 0 1 0 0 | 4 | | 4 | |  | |
|  | 5 | | | 0 1 0 1 | 5 | | 5 | |  | |
|  | 6 | | | 0 1 1 0 | 6 | | 6 | |  | |
|  | 7 | | | 0 1 1 1 | 7 | | 7 | |  | |
|  | 8 | | | 1 0 0 0 | 8 | | 10 | |  | |
|  | 9 | | | 1 0 0 1 | 9 | | 11 | |  | |
|  | 10 | | | 1 0 1 0 | A | | 12 | |  | |
|  | 11 | | | 1 0 1 1 | B | | 13 | |  | |
|  | 12 | | | 1 1 0 0 | C | | 14 | |  | |
|  | 13 | | | 1 1 0 1 | D | | 15 | |  | |
| **Activity** | 14 | | | 1 1 1 0 | E | | 16 | |  | |
|  | 15  **1.2 Perform the Following Conversions** | | | 1 1 1 1 | F | | 17 | |  | |
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|  | **Decimal** | | **Binary** | | **Octal** | **Hexadecimal** | |  | | |
|  | 23 | | 0001 0111 | | 27 | 17 | |  | | |
|  | 61 | | 111101 | | 75 | 3D | |  | | |
|  | 23 | | 0001 0111 | | 27 | 17 | |  | | |
|  | 908 | | 0011 1000 1100 | | 1614 | 38C | |  | | |
|  | 89 | | 0101 1001 | | 131 | 59 | |  | | |
|  | 17 | | 10001 | | 21 | 11 | |  | | |
|  | 143 | | 1000 1111 | | 217 | 8F | |  | | |
|  | 31 | | 0001 1111 | | 37 | 1F | |  | | |
|  | 154 | | 1001 1010 | | 232 | 9A | |  | | |
| 99 | | 0110 0011 | | 143 | 63 | |
|  | | A: Multiple Choice Questions:  **Chapter-2**  **Basic Concepts of Python Programming**  Date  Page No. | | | | | | | |
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|  | | 1. The \_\_**IDLE**\_\_ is a default editor that accompanies Python. 2. **IDLE** ✅ B) IPLE C) Text Editor D) Notepad 3. The **\_\_>>>\_\_\_\_** is the shell prompt where we type in our commands. 4. << B) >> **C) >>>** ✅ D) <<< 5. IDE stands for **Integrated Development Environment.** 6. Integrated Direct Environment 7. **Integrated Development Environment** ✅ 8. Information Development Environment 9. None of These 10. To run a script file code in Python, we can use \_\_\_\_F5\_\_\_\_ shortcut key. 11. F1 B) F2 C) F5 ✅ D) F7 12. \_\_\_ **Tokens** \_\_\_\_\_ are like words and punctuation marks in English language. 13. Literals B) Identifiers C) Variables D) Tokens ✅ 14. \_\_\_\_\_**Identifiers**\_\_\_\_ are the names given to program elements such as variables, functions, lists, tuples, classes, etc., to uniquely identify them in code.   A) Literals B) Identifiers ✅ C) Variables D) Tokens   1. Literals are the \_\_\_\_*Fixed \_\_\_\_* values used in a source code. 2. **Fixed ✅** B) Boolean C) String D) Float 3. \_\_\_\_\_\_ are those identifies which are used to store values and they allow us to change their value during runtime.   A) Constant **B) Variable ✅** C) List D) Tokens   1. A Comment is basically a text that gives and \_\_\_\_ Explanation\_\_\_\_\_ about the program code. 2. Execution B) Compilation **C) Explanation ✅** D) All of these 3. We can display program data to the console in Python with \_\_\_print() \_\_\_\_ function. 4. Input() **B) print() ✅** C) output() D) All of these | | | | | | | |
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|  | | **B : Short Answer Type Questions:** | | | | | | | |
|  | | Q1. What do you know about Python?  Ans: Python is a high-level, interpreted programming language known for its simple and easy-to-read syntax. It supports multiple programming paradigms like procedural, object-oriented, and functional programming. Python is widely used in web development, data science, machine learning, automation, and more. It was created by **Guido van Rossum** and **first released in 1991.** | | | | | | | |
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|  | Q2. What is IDE?  Ans: An IDE (Integrated Development Environment) in Python is a software application that provides comprehensive facilities for Python programming. It includes features like code editing, debugging, running Python code, and managing projects. Popular Python IDEs include **IDLE**, **PyCharm**, **VS Code**, and **Jupyter Notebook**. They make coding easier by offering syntax highlighting, autocompletion, and other helpful tools.  **Chapter-2**  **Basic Concepts of Python Programming**  Date  Page No. |
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|  | Q3. How can you view the list of Keywords using Python Shell? Write Some examples of Keywords.  Ans: Python has a set of **reserved keywords** that are predefined and have special meanings. These keywords cannot be used as identifiers (such as variable names or function names) because they are used by the Python language itself.  You can view the list of keywords in Python by using the keyword module. In Python Shell, you can execute the following code:  import keyword  print(keyword.kwlist)  This will display a list of all the reserved keywords in Python’s are: *False, await, else, import pass, None, break, except, in, raise, True, class, finally, is, return, and, continue, for, lambda try, as, def, from, nonlocal, while, assert, del, global, not, with, async, elif, if, or, yield* |
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| Q4. How will you declare variable in Python? Give Examples  Ans: In Python, variables are declared by simply assigning a value to a name. No explicit declaration is needed, and Python automatically determines the variable's type based on the assigned value.  x = 5 # Integer  name = "Balli " # String  is\_active = True # Boolean  Here, x is assigned the value 5 (integer), name is assigned "balli " (string), and is\_active is assigned True (boolean). |  |
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|  | Q5. Why print() function is used in Python programs?  Ans: The print() function in Python is used to output data to the console or terminal. It allows you to display values, variables, or messages for the user to see. This is helpful for debugging, showing results, or providing information to the user.  print("Hello, World!") *# This will print the string "Hello, World!" on the screen.* |
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|  | **Chapter-2**  **Basic Concepts of Python Programming**  **C : Long Answer Type Questions:**  Date  Page No. |
|  | Q1. Explain Token ? Explain Various types of tokens used in Python.  Ans: A **token** is the smallest unit of a program that has meaningful representation in Python. In simpler terms, tokens are the building blocks of a Python program. When you write Python code, the interpreter breaks it down into these individual tokens for further processing. Tokens can be classified into several categories, each representing a specific type of element in the program.  The main types of tokens in Python are:   1. **Keywords**: These are reserved words with predefined meanings that cannot be used as identifiers. They define the structure of the language, such as control flow and function definitions. 2. **Identifiers**: These are names used to identify variables, functions, classes, and other objects in a program. They are defined by the programmer. 3. **Literals**: These represent constant values directly in the code, such as numbers, strings, and boolean values. They are used to assign values to variables. 4. **Operators**: Symbols that perform operations on variables and values, including arithmetic, comparison, logical, and assignment operations. 5. **Punctuation (Delimiters)**: These include symbols such as parentheses, brackets, commas, and colons, which structure the code and separate different elements. 6. **Comments**: These are used for adding explanations or notes within the code and are not executed. |
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|  | Q2. What are Identifiers ? write down their naming rules.  Ans: In Python, **identifiers** are names used to identify variables, functions, classes, modules, or other objects. An identifier allows the program to access and manipulate the value associated with it. It is essentially a label used to reference data in the program.  **Naming Rules for Identifiers in Python:**   1. **Start with a Letter or Underscore**: An identifier must begin with a letter (a-z, A-Z) or an underscore (\_). It cannot start with a digit (0-9). 2. **Subsequent Characters**: After the first character, an identifier can contain letters, digits (0-9), and underscores (\_). 3. **Case Sensitivity**: Identifiers are case-sensitive, meaning myvariable, MyVariable, and MYVARIABLE are considered different identifiers. 4. **No Reserved Keywords**: Identifiers cannot be Python keywords (such as if, else, True, False, etc.), as these have special meanings in Python. 5. **No Special Characters**: Identifiers cannot contain spaces or special characters (e.g., @, #, &, \*, etc.). 6. **Length**: There is no fixed length for identifiers, but it is recommended to keep them descriptive yet concise for readability. |
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|  | Q3. What are Literals? Draw a chart to represents the different types of literals used in Python.  Ans: In Python, **literals** are fixed values or raw data that appear directly in your code. They represent constant values of built-in data types. When you write a literal, you are essentially telling Python the exact value you want to use.  For example, 10 is an integer literal, "hello" is a string literal, 3.14 is a floating-point literal, and True is a boolean literal. These values are embedded directly into the source code.  **Chapter-2**  **Basic Concepts of Python Programming**  Date  Page No. |
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|  | Literals |
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|  | Collection  Numeric  Special  Boolean  String |
|  | Integer |
|  | List |
|  | Integer |
|  | Tuple |
|  | Integer  Dictionary |
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|  | Set |
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|  | Q4. What are Comments? Write the Different Ways of Writing Comments in Python.  Ans: Comments are explanatory notes added to your code that are ignored by the Python interpreter. They are used to make your code more readable and understandable for yourself and others. Good comments explain the "why" behind the code, not just the "what."  Here are the different ways to write comments in Python:  **1. Single-line Comments:**  You can write a single-line comment by starting the line with a hash symbol (#). Anything after the # on that line is considered a comment and will not be executed.  *x = 10 # Assigning the value 10 to the variable x.*  **2. Multi-line Comments (Using Triple Quotes):**  While Python doesn't have a specific syntax for multi-line comments like some other languages (e.g., /\* ... \*/ in C++ or Java), the common and widely accepted way to write multi-line comments is by enclosing the text within triple quotes (''' or """). These are technically multi-line strings, but when they are not assigned to a variable, they are treated as comments by the interpreter.  """ You can also use double  triple quotes for  multi-line comments. """ |
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|  | A: Multiple Choice Questions:  Date  Page No. |
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|  | 1. Which of the following program element is used to hold value in memory?   **A) Variable ✅** B) Comments C) Operators D) All of these   1. Which of the following is not a Standard Numeric Data type in Python? 2. Integer B) Floating **C) Boolean** ✅ D) Complex 3. Which of the following represents the Mapping Data type in Python? 4. List **B) Dictionary** ✅ C) Tuple D) Set 5. The \_\_\_\_\_\_\_\_ keyword is used to define a null value, or no value in Python? 6. Nothing B) Null C) Zero **D) None** ✅ 7. The \_\_\_\_\_\_\_\_\_\_\_ Keyword is used to represent the True/ False value in Python. 8. **bool** ✅ B) boolean C) Boolean D) None 9. For Creating a list a Python, we write data items in \_\_\_\_\_\_\_\_\_\_\_ 10. Parenthesis **B) Square brackets** ✅ C) Curley Brackets D) Angular Brackets 11. \_\_\_\_\_\_\_\_\_ in python are used to represent Unicode character values. 12. **String** ✅ B) Tuple C) List D) Set 13. \_\_\_\_\_\_\_\_\_\_ types are those types whose contents are allowed to be changed after the creation. 14. **Mutable** ✅ B) Immutable C) None D) Mapping 15. Which of the following is not an Arithmetic Operator in Python? 16. / B) // C) \*\* **D) ++ ✅** 17. Which of the following function(s) is used for type conversion? 18. int() B) float() C) str() **D) all of these** ✅ |
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|  | B: Write Ture or False for the Following statements: |
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|  | 1. Symbol % represents modulus operator which is used to get the remainder value after division of two numbers.✅ **True** 2. Relational operators return either True or False value After Comparison. ✅ **True** 3. Operators are the special symbols which are used to perform common operations on operands. ✅ **True** 4. A set is an unordered collection of comma-separated values in the square brackets. ❌ **False** 5. A Sequence is an ordered collection of similar or different data items. ✅ **True** |
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**Chapter-3**

**Data Types, Operation & Expressions**

**Python Programming**

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|  | C: Short Answer Type Questions:  **Chapter-3**  **Data Types, Operation & Expressions**  **Python Programming**  Date  Page No. |
| Q1. What are floating point numbers. Give Examples.  Ans: **Floating point numbers** are numbers that have a **decimal point** or are written in **exponential (scientific) notation**. They are used to represent **non-integer (real) values**, including very large or very small numbers with fractional parts. In Python (and many other languages), float is the data type used for floating point numbers. Examples: 3.14, 0.5, 1.2e3 *(which means 1.2 × 10³ = 1200.0)* |  |
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|  | Q2. What do you know about the Boolean Data Type of Python?  Ans: The Boolean data type (Booleans are a subtype of integers, Boolean values are case-sensitive) in  Python represents one of two possible values:   1. **True is treated as 1** 2. **False is treated as 0**   These values are used to represent the truth value of expressions and are commonly used in  conditions, comparisons, and logical operations. |
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|  | Q3. What are the sequence Data Type in Python? Write their Name.  Ans: The sequence data types in Python are those that can hold multiple items in an ordered manner, meaning the position of each item matters. Here are their names:   1. List 2. Tuple 3. Range 4. String (also a sequence of characters) 5. Byte (for binary data) 6. Bytearray (mutable version of bytes) |
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|  | Q4. Explain Operands with suitable examples.  Ans: An **operand** is a value or variable on which an operator performs an operation. In expressions, operators act on operands to produce a result. For Example:  a = 10  b = 5  result = a + b # **a and b are operands**, + is the operator  print(result) # Output: 15 |
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|  | **Chapter-3**  **Data Types, Operation & Expressions**  **Python Programming**  Date  Page No. |
|  | Q5. What are Arithmetic Operators? Give Examples.  Ans: In Python, Arithmetic operators are symbols used to perform mathematical operations on numerical values, known as operands. For Example: **Arithmetic Operators: +, -, \*, /, %, //, \*\***  a = 10 # a is operands  b = 3 # b is operands  print(a + b) # 13  print(a - b) # 7  print(a \* b) # 30  print(a / b) # 3.333...  print(a % b) # 1  print(a // b) # 3  print(a \*\* b) # 1000 |
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|  | Q6. What is Expression?  Ans: An expression in Python is a combination of values, variables, operators, and function calls that Python interprets and evaluates to produce a result.  result = 5 + 3  # Expression: 5 + 3 → Evaluates to 8 |
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|  | D: Long Answer Type Questions: |
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|  | Q1. What do you mean by Data Types? Draw a chart representing the various common standard data  types used in Python.  Ans: **Data types** in Python define the kind of value a variable can hold and what operations can be performed on that value. For example, whether it's a number, text, list, or something else.  **Examples:**   * int: a = 10 * float: b = 3.14 * str: name = "balli" * list: numbers = [1, 2, 3] * dict: info = {"name": "balli", "age": 25} |
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|  | Date  Page No. |
| Q2. What is the difference between Mutable and Immutable Types?  Ans: In Python, **Mutable** refers to **objects that can be changed after they are created**. That means you can modify their **content, size, or structure** without changing their identity (i.e. the object stays the same in memory). **For Example** : list, dict, set and butearray  numbers = [1, 2, 3]  numbers[0] = 100 # Modifies the original list  numbers.append(4) # Adds new item  print(numbers) # Output: [100, 2, 3, 4]  An **immutable** object in Python is **one that cannot be changed** after it is created. If you try to modify it, a new object is created instead. **For Example** : int, float, str, tuple, bool  frozenset and bytes  x = 5  x = x + 1 # A new integer object is created  print(x) # Output: 6 |  |
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|  | Q3. What are Operators? Explain any two types of operators used in Python.  Ans: **Operators** in Python are **symbols or keywords** used to perform operations on variables and values. They are the core of all computations, allowing actions like addition, comparison, logic testing, and more.  Python supports several types of operators, including:   * **Arithmetic operators** * **Comparison (relational) operators** * **Assignment operators** * **Logical operators** * **Bitwise operators** * **Membership operators** * **Identity operators**   **Arithmetic Operators:** Used to perform mathematical operations like addition, subtraction, multiplication, etc. . For Example: **Arithmetic Operators: +, -, \*, /, %, //, \*\***  **a = 10 , b = 3**  **print(a + b) # Output: 13**  **print(a % b) # Output: 1**  **Comparison Operators:** Used to **compare two values**. They return True or False. For example  x = 10 , y = 20 ,  print(x < y) # Output: True  print(x == y) # Output: False |
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**Chapter-3**

**Data Types, Operation & Expressions**

**Python Programming**

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| Q3.2 Try find the Answer for the following Statements:   1. Which of the following statement is not correct ? 2. print(“7”+”9”) **B) print(int(“seven”))** ✅ C) print(7+9) D) print(7)   ***Explanation: You can't convert the string "seven" to an integer. It will raise a ValueError.***   1. Which of the Following is not a correct Arithmetical Expressions? 2. A=3-1\*2 B) Y+=1 **C) 15+6=Z** ✅ D) Ten=5\*4   ***Explanation: In Python, assignment must be written as Z = 15 + 6. The expression 15 + 6 = Z is a syntax error.***   1. Which of the following is correct example of type conversion ? 2. Int(5.0+”0.1”) B) int(“four”) C) int(“77”+”five”) **D) int(5.0+2.3)** ✅   ***Explanation: 5.0 + 2.3 gives 7.3, and int(7.3) results in 7. It's a valid conversion.***   1. Which of the following expression does not produce 4 result ? 2. 17//4 B) 13%9 **C) 2\*\*9** ✅ D) 17/4   ***Explanation: 2\*\*9 = 512, not 4. Others:***   * ***17//4 = 4*** * ***13 % 9 = 4*** * ***17 / 4 = 4.25 (but close, though technically not exactly 4)***   ***So if "does not produce 4" means exactly not 4, C and D are both technically correct. But C is the most clearly incorrect.***   1. Which of the following is a wrong way of comments in Python ? 2. “””this is comment “”” B) # this is Comment   C**) //this is comment** ✅ D) ###### This is Comment  ***Explanation: // is not a comment symbol in Python (it is in languages like C++ and Java). Python uses # or triple quotes for multiline strings***.   1. Which of the following are the correct values of Boolean data type in Python ? 2. Yes/No B) Agree/Disagree **C) True/False** ✅ D) Right/Wrong   ***Explanation: True and False are the only valid Boolean values in Python.***   1. If the Value of a=20 and b=20, then a+=b will assign \_\_\_\_\_ to a 2. **40** ✅ B)30 C) 20 D) 10   ***Explanation: a += b is equivalent to a = a + b, so 20 + 20 = 40***   1. The \_\_\_\_\_\_\_\_ operator is used to find out if division of two number yield any remainder. 2. / B)+ C) **%** ✅ D) //   ***Explanation: The modulus operator % returns the remainder of a division.*** | **Chapter-3**  **Data Types, Operation & Expressions**  **Python Programming**  Date  Page No. |
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|  | **Chapter-3**  **Data Types, Operation & Expressions**  **Python Programming**  Date  Page No. |
|  | Q3.3 Execute the following statements in Python IDLE and write down the outputs :   1. print(“Hello” +”Friends”) 2. print(15+7-3\*2%4) 3. a=5.2 #float Value   msg=”Good Morning” # String Value  c=4+3j #complex value  d=5%2.0 #Modulus Operator  print(msg+”Friends”)  print(msg,”Friends”)  print(a,c,5/2.0,5//2.0,d)   1. x,y=12,6   x,y,=y,x+2  print(x,y)   1. p,q,r=5,2,1   p\*\*=q+r  r=’5’+’5’  print(p,q,r)   1. result=float(10)+int(5.2)   print(result)   1. a=7   b=4  exp1=(a>b)  print(“Result of Expression: ”,exp1) |
|  | **Explanation:** String concatenation using +  HelloFriends |
|  | **Explanation:**  3 \* 2 = 6  6 % 4 = 2  15 + 7 - 2 = 20 |
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|  | "Good Morning" + "Friends" → concatenated string2 5 / 2.0 → float division → 2.5  5 // 2.0 → floor division → 2.0  5 % 2.0 → modulus → 1.0  4 + 3j is a complex number |
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|  | Good MorningFriends  Good Morning Friends  5.2 (4+3j) 2.5 2.0 1.0 |
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|  | 6 14  **Explanation:**   * x = 12, y = 6 * After x, y = y, x + 2:   + x = 6 (old value of y)   + y = 12 + 2 = 14 |
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|  | **Explanation:**   * q + r = 2 + 1 = 3 * p \*\*= 3 → 5 \*\* 3 = 125 * r = '5' + '5' → string concatenation → '55'   125 2 55 |
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|  | 15.0  **Explanation:**   * float(10) = 10.0 * int(5.2) = 5 * 10.0 + 5 = 15.0 |
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|  | Result of Expression: True |
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|  | **Explanation:**   * a > b → 7 > 4 → True |
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|  | Q3.4 Find the Errors in the following code and write the Correct Statements:   1. print 7   **Error:** Missing parentheses.  In Python 3, print is a function and must be used with parentheses.   1. print(Hello)   **Error:** Hello is treated as a variable because it's not in quotes, but it’s not defined.   1. print(“Hello”+Friends)   **Errors:** Friends is not quoted and treated as an undefined variable.   1. a==10   print(“Value of a is “ a)  **Errors:**   * a == 10 is a comparison, but assignment is needed (a = 10). * The print statement is missing a comma or + between string and variable.   **Chapter-3**  **Data Types, Operation & Expressions**  **Python Programming**  Date  Page No. |
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|  | print(7) |
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|  | print("Hello") |
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|  | print("Hello" + "Friends") |
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|  | a = 10  print("Value of a is", a) |
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| 1. If we have to select one from two or more options during programming, then we will use which of the following options: 2. Simple if **B) ifelif else** **✅** C) Sequence Execution D) None of these 3. How will you define the logical expression for the following condition?   “Marks are greater than or equal to 60 but less than 80”   1. If marks >=80 and marks<=60 C) If marks >60 and marks<=80 2. 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? 4. else if ladder B) Simple if else **C) Nested if else ✅** D) None of these 5. Conditional Flow Control is also known as? 6. Branching Statement C) Looping Statement 7. Decision Making Statement **D) Both a and b** ✅ 8. Looping Statement is also known as? 9. **Iterative Statement ✅** C) Sequential Statement 10. Conditional Statement D) All of these 11. If we have to repeat the execution of one or more statements, we can use 12. **Iterative Statement ✅** C) Conditional Statements 13. Skipping Statements D) None of these 14. How will you define the range function for generating following sequence?   “2,4,6,8,10,12,14,16”   1. range(2,16) C) range(2,17) 2. **range(2,17,2) ✅** D) range(2,16,2) 3. When we use a loop within another loop, it is called ? 4. Infinite Loop **B) Nested Loop ✅** 5. for while loop d) None of these 6. A loop that never ends is called a: 7. Continuous Loop  **C) Infinite Loop ✅** 8. Circular Loop D) None of these 9. The \_\_\_\_\_\_\_\_\_ statements in Python brings control out of loop. 10. **Break** ✅ B) back C) pass D) continue 11. Which of the following loop will continue infinitely ? 12. while 0: B) **while 1:** ✅ C) while:1: D) while False: | A: Multiple Choice Questions:  **Chapter-4:** Control Statements  Date  Page No. |
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|  | **Chapter-4:** Control Statements  C: Complete/ Modify the Following Code :  Date  Page No. |
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|  | num1 = **int(input("Enter first number: "))**  num2 = **int(input("Enter second number: "))**  if **num1 == num2**:  print("Both numbers are equal")  elif **num1 > num2**:  print("num1 is greater than num2")  else:  print("num2 is greater than num1") |
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|  | D: Write the Output of following Code and do changes as specified below: |
|  | num1 = 10  num2 = 5  if **num1 > num2**:  if(num1%num2==0):  print(num1, "num1 is Divisible by”, num2)  else:  print(num1, "num1 is not Divisible by", num2)  else:  print(num1\*num2)    Ans. **Output Explanation:**   * num1 = 10, num2 = 5 * 10 > 5 → True * 10 % 5 == 0 → True (10 is divisible by 5) |
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|  | **Output:**  **10 num1 is Divisible by 5** |
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|  | What changes will you do in above code to execute print(num1\*num2) statement?  When the statement “**if num1 > num2:”** becomes false, the else block is executed, and the print(num1 \* num2) statement runs. For example  num1 = 3  num2 = 5  Now, 3 > 5 is False, so it enters the else block. |
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|  | **Chapter-4:** Control Statements   1. Factorial using while loop   i=1;f=1;n=5  while i <=n:  f= f\*i  i=i+1  print(f)   1. Print a **right-angled triangle pattern of asterisks** using nested for loops   for row in range(1,5):  for col in range(1,row):  print(“\*”, end=””)  print()  E: Write the Output of following Code  Date  Page No. |
|  | 1. Decrementing num using while loop:   Num=10  While num> 1:  print(num)  num-=2   1. Multiples of 5 using for loop   For i in range(1,11):  print(i\*5)     1. Counting Down   for r in range(15, 0, -2):  print(r)   1. Iterating over a string   State=’PUNJAB’  for s in state:  print(s) |
|  | **10**  **8**  **6**  **4**  **2** |
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|  | A: Multiple Choice Questions:  **Chapter-5:** Basic Concepts of Database Management System  Date  Page No. |
| 1. Which Network Model is designed in the form of plex network? 2. Hierarchical Model **C) Network Model ✅** 3. Relational model D) None of these   **Explanation:** The **Network Model** allows complex relationships with many-to-many connections and is often visualized as a **plex structure** (graph-like).   1. Which of the following represents the name of Column in a table? 2. Relational **B) Attribute** ✅ C) Degree D) tuple   **Explanation:** In relational databases, **columns** are referred to as **attributes**.   1. Which of the following is not a component of Database? 2. Hardware B) Software **C) Network** ✅ D) User   **Explanation:** Database components include **hardware**, **software**, **users**, and **data**. **Network** is part of infrastructure but not a core database component.   1. Who is responsible to administrate the database? 2. End Use B) System Programmers **C) Database Administrator** ✅ D) Data Modelers   **Explanation:** A **Database Administrator (DBA)** manages, maintains, and secures the database.   1. An organized or classified Data is known as:   **A) Information ✅** B) Table C) Result D) None of these  **Explanation:** When **data** is processed, organized, or structured, it becomes **information**. |  |
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|  | B: Fill in the Blanks: |
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|  | 1. **\_\_File-based\_\_\_\_** systems were traditional systems for the storage of facts in a manual way. 2. \_\_***Schema*** \_\_\_\_\_ can be referred as logical structure of the Database. 3. The total number of records present in table is called **\_\_\_cardinality\_\_\_** of a relation. 4. The \_***primary*** \_\_\_\_\_\_ key refers to identify all the records uniquely in a particular column. 5. **\_ SQL (Structured Query Language)\_\_** is a standardized language which provides commands to define the storage groups, different structures and objects in a database. |
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|  | C: Write the full forms of the following: |
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| 1. RDBMS – **Relational Database Management System** 2. DBMS – **Database Management System** 3. DML – **Data Manipulation Language** 4. DBA **- Database Administrator** 5. DDL – **Data Definition Language** 6. SQL – **Structured Query Language** |  |
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|  | **Chapter-5:** Basic Concepts of Database Management System  D: Short Answer Type Questions:  Date  Page No. |
|  | Q1. Define Data and Information.  Ans: 1. **Data**: Raw, unorganized facts or figures without context. Data can be numbers, text, images, sounds, etc., and by itself, it may not have meaning. **Example**: "100", "blue", "John", "23".  2. **Information**: Processed, organized, or structured data that has meaning and is useful for decision-making or understanding. **Example**: "John is 23 years old and has blue eyes." |
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|  | Q2. What do you mean by DBMS.  Ans: **DBMS** stands for **Database Management System**, It is a **software system** that allows users to **create**, **store**, **manage**, **retrieve**, and **update** data in a **structured** and **efficient** way. A DBMS is like a **digital filing cabinet** that helps you organize and manage lots of information easily and securely. |
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|  | Q3. Explain the Hardware Component of the Database.  Ans: The **hardware component** of a database refers to the **physical devices** required to run the database system and store/manage data. These are the foundational parts that support the functioning of the DBMS. The hardware ensures the **performance**, **availability**, and **reliability** of a database system. Without appropriate hardware, even the best DBMS software cannot function efficiently. |
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| Q4. Write a sort note on Data Models.  Ans: A **data model** is a **conceptual framework** that defines how data is **organized**, **stored**, and **related** within a database. It provides a **blueprint** for designing a database structure and helps in understanding the data flow.  **Types of Data Models:**   1. **Hierarchical Model** 2. **Network Model** 3. **Relational Model** 4. **Object-Oriented Model** 5. **Entity-Relationship (E-R) Model** |  |
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| Q5. Define the relation in Database.  Ans: In database terminology, a **relation** refers to a **table** in a **relational database**. It is a structured format to store data in **rows** and **columns**. A **relation** is simply a **table** in a relational database that organizes data in a meaningful, structured way.  Each **row** (also called a **tuple**) represents a single record.  Each **column** (also called an **attribute**) represents a field of the record. |  |
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|  | **Chapter-5:** Basic Concepts of Database Management System  Q6. What do you mean by degree and **cardinality** of relations ?  Ans: In relational databases, **degree** and **cardinality** describe the **structure** and **size** of a table (relation).  **1. Degree of a Relation**   * **Definition**: The **number of attributes (columns)** in a relation. * It indicates how many fields each record contains.   **Example:**   | **ID** | **Name** | **Age** | | --- | --- | --- | | 1 | John | 22 |   This table has **3 columns** → So, **degree = 3**  **2. Cardinality of a Relation**   * **Definition**: The **number of tuples (rows)** in a relation. * It shows how many records are stored in the table.   **Example:**   | **ID** | **Name** | **Age** | | --- | --- | --- | | 1 | John | 22 | | 2 | Mary | 23 | | 3 | Alex | 21 |   This table has **3 rows** → So, **cardinality = 3**  Date  Page No. |
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|  | Q7. Define the Primary Key of a database.  Ans: A **Primary Key** is a **special attribute or a set of attributes** in a database table that **uniquely identifies each record (row)** in that table.   1. **Unique**: No two rows can have the same primary key value. 2. **Not Null**: A primary key cannot contain null (empty) values. 3. Each table can have **only one primary key**.   **Example:**   | **StudentID** | **Name** | **Age** | | --- | --- | --- | | 101 | Alice | 20 | | 102 | Bob | 21 | | 103 | Clara | 22 |  * Here, StudentID is the **primary key** because it uniquely identifies each student. |
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|  | **Chapter-5:** Basic Concepts of Database Management System  D: Long Answer Type Questions:  Q1. What are the components of a Database? Explain in detail.  Ans: A **database** is a structured system for storing, managing, and retrieving data. To function effectively, it relies on several key components. These components work together to ensure the database is **efficient**, **secure**, and **reliable**.     | **Component** | **Description** | | --- | --- | | **Hardware** | Physical equipment that runs the database | | **Software** | DBMS and related programs | | **Data** | Actual stored information | | **Procedures** | Guidelines for managing and using the database | | **Database Language** | SQL or similar language for data operations | | **Users** | People who interact with the database system |   Date  Page No. |
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|  | Q2. Define the characteristics of a Database.  Ans: A **database** is more than just a collection of data — it is designed to be **efficient**, **reliable**, **and accessible**. Here are the key characteristics that define a good database system:   | **Characteristic** | **Description** | | --- | --- | | Data Independence | Separates data structure from application logic | | Data Integrity | Maintains correctness of data | | Data Security | Protects data from unauthorized access | | Redundancy Control | Eliminates duplicate data | | Data Consistency | Ensures data accuracy across the system | | Concurrent Access | Supports multi-user access safely | | Backup and Recovery | Restores data after failures | | Scalability | Handles increased data and user loads | | Query Language Support | Enables easy data manipulation and retrieval | |
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|  | **Chapter-5:** Basic Concepts of Database Management System  Date  Page No. |
|  | Q3. What is Relational Data Model of a database? Explain in detail.  Ans: The **Relational Data Model** is a type of **data model** used to organize data into **tables (called relations)** that are logically connected. It was proposed by **E.F. Codd** in **1970** and is the foundation of most modern **Relational Database Management Systems (RDBMS)** like MySQL, Oracle, SQL Server, and PostgreSQL. The **Relational Data Model** stores data in the form of related tables. It is efficient, flexible, and widely used in real-world applications like banking, education, e-commerce, etc.  **Advantages:**   * Easy to understand and use. * Supports powerful query languages (like SQL). * Ensures data consistency and integrity. * Easier to maintain and extend.   **Example: Students Table**   * **Relation**: Students * **Attributes**: StudentID, Name, Age * **Tuples**: Each row (101, Alice, 17) is a tuple * **Primary Key**: StudentID  | **StudentID** | **Name** | **Age** | | --- | --- | --- | | 101 | Alice | 17 | | 102 | Bob | 18 | |
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|  | Q4. What is SQL? Explain sub language of SQL.  Ans: **SQL** (Structured Query Language) is a **standard programming language** used to **manage and manipulate relational databases**. It allows users to **create**, **retrieve**, **update**, and **delete** data stored in a relational database. SQL is supported by most RDBMSs (Relational Database Management Systems) such as **MySQL, Oracle, PostgreSQL, SQL Server**, and others.  **Sub-Languages of SQL :** SQL is divided into several **sub-languages**, each designed for specific types of tasks. The main sub-languages of SQL are:   | **Sub-Language** | **Purpose** | **Examples** | | --- | --- | --- | | **DDL** | Define/alter database structure | CREATE, ALTER, DROP | | **DML** | Manipulate data | INSERT, UPDATE, DELETE | | **DQL** | Query data | SELECT | | **DCL** | Control access | GRANT, REVOKE | | **TCL** | Manage transactions | COMMIT, ROLLBACK, SAVEPOINT | |
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|  | 1. Software that plays a supporting role for users and developers, are called \_\_\_\_\_\_ 2. Operating System **C) Utility Programs ✅** 3. Protection Tools D) Developer Tools   **Explanation: Utility programs assist users and developers by performing specific system tasks like file management or system optimization.**   1. \_\_\_\_\_\_\_ 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. 2. Fragmentation C) Disk Cleanup 3. **Defragmentation ✅** D) None of these   **Explanation: Defragmentation reorganizes scattered data on the hard drive to improve system performance.**   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a system software which acts as an interface between the user and computer hardware. 2. Utility Program C) Antivirus Program 3. Protection System **D)** **Operating System** **✅**   **Explanation: An operating system acts as an interface between the user and computer hardware.**   1. Which of the following mode is a diagnostic mode of computer operating system? 2. Developer Mode **C)** **Safe Mode** **✅** 3. Operating Mode D) Diagnostic Mode   **Explanation:** **Safe Mode is a diagnostic mode used to troubleshoot issues by loading only essential system files.**   1. Which of the following utility can be used to protect out system from malwares? 2. Compression Tools **C)** **Antivirus Tools** **✅** 3. Disk Management Tools D) None of these   **Explanation: Antivirus tools protect the system from malware and other security threats.**   1. A\_\_\_\_\_\_\_\_\_\_\_\_ Includes bug fixes , and other small improvements.    1. **Software Update** **✅** C) Software Upgrade    2. Disk Management Tool D) All of these   **Explanation: A software update includes minor changes like bug fixes and small improvements.**   1. A \_\_\_\_\_\_\_\_\_\_\_\_\_ is a security system that does not allow unauthorized access on out system while we are connected to a network    1. Encryption **C) Firewall ✅**    2. Antivirus D) all of these   **Explanation: A firewall blocks unauthorized access to a computer system over a network.**    A: Multiple Choice Questions:  **Chapter-6: Computer System Maintenance**  Date  Page No. |
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|  | **Chapter-6: Computer System Maintenance**  B: Write the Full Forms for the Following :  Date  Page No. |
|  | 1. PnP – **Plug and Play** 2. USB – **Universal Serial Bus** 3. PCB – **Printed Circuit Board** 4. DVI – **Digital Visual Interface** 5. OS – **Operating System** 6. VGA – **Video Graphics Array** |
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|  | C: Short Answer Type Questions: |
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|  | Q1. What do you mean by Computer Maintenance?  Ans  **Computer Maintenance** refers to the regular practices and tasks performed to keep a computer system running efficiently, securely, and reliably. It includes both **hardware** and **software** upkeep.  **Common Tasks in Computer Maintenance:**   * Cleaning the computer (physically and digitally). * Updating operating systems and drivers. * Defragmenting hard drives (for HDDs). * Backing up data regularly. * Removing unnecessary files and programs. * Scanning for and removing malware.   **Importance:**   * Improves computer performance. * Extends the life of the system. * Protects data and privacy. * Prevents unexpected failures. |
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|  | Q2 Write any four techniques to improve the performance of computer system?  Ans Here are **four techniques to improve the performance of a computer system**:   1. **Uninstall Unnecessary Programs**    * Removing unused software frees up system resources like memory and storage, making the computer run faster. 2. **Upgrade RAM (Memory)**    * Adding more RAM helps the computer handle more tasks at once, improving speed and performance, especially during multitasking. 3. **Use an SSD Instead of HDD**    * Replacing a traditional hard drive with a Solid State Drive (SSD) can significantly increase boot time, file access speed, and overall system responsiveness. 4. **Run Regular Disk Cleanup and Defragmentation**    * Cleaning up temporary files and defragmenting (on HDDs) helps organize data more efficiently, speeding up file access and system operations. |
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|  | Q3. What is booting?  Ans Booting is the process of starting a computer and loading the operating system into RAM (Random Access Memory) so that it becomes ready for use.  **Types of Booting:**   1. **Cold Booting (Hard Booting):**    * Starting the computer from a completely powered-off state.    * Example: Turning on the computer using the power button. 2. **Warm Booting (Soft Booting):**    * Restarting the computer without turning off the power.    * Example: Clicking "Restart" in the Start menu.   **Steps in Booting:**   1. **Power is turned on.** 2. **BIOS/UEFI** runs a hardware check called **POST (Power-On Self Test)**. 3. The system locates and loads the **Operating System** (like Windows or Linux) from the hard drive or SSD. 4. The computer is ready for use.   **Chapter-6: Computer System Maintenance**  Date  Page No. |
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| Q4. Write the name of different types of Ports available in the modern computers?  Ans 1. **USB Port (Universal Serial Bus)**   * Used to connect devices like keyboards, mice, flash drives, and printers.   2. **HDMI Port (High-Definition Multimedia Interface)**   * Used to connect monitors, TVs, and projectors for audio and video output.   3. **Ethernet Port (RJ-45)**   * Used for wired internet/network connections.   4. **Audio Jack (3.5 mm port)**   * Used for headphones, microphones, and speakers.   **5. VGA Port (Video Graphics Array)** *(less common now)*   * Used for older monitors and projectors. |  |
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|  | Q5. How will you add new fonts in the computer system?  Ans Here are the steps to add new fonts to a Windows computer:  **The Control Panel**   1. **Open Control Panel**    * Go to **Start Menu** → search for **Control Panel**. 2. **Click on “Fonts”**    * In the Control Panel, find and click **Fonts**. 3. **Drag and Drop the Font File**    * Drag your downloaded font file into the Fonts window.    * The system will automatically install it. |
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|  | **Chapter-6: Computer System Maintenance**  Date  Page No. |
|  | Q6. What are Utility Programs?  Ans **Utility programs** are special types of software designed to help manage, maintain, and optimize a computer system. They perform specific tasks to support the overall functioning of the computer. **Utility programs** are tools that help keep your computer running smoothly, safely, and efficiently.  **Examples of Utility Programs:**   1. **Antivirus Software** – Protects the computer from malware (e.g., Windows Defender, Avast). 2. **Disk Cleanup Tool** – Deletes temporary and unnecessary files. 3. **Backup Software** – Helps create copies of important files and restore them if needed. 4. **File Compression Tools** – Reduces file size (e.g., WinRAR, 7-Zip). 5. **Defragmentation Tool** – Organizes data on a hard disk to speed up access (mainly for HDDs). 6. **Firewall** – Monitors network traffic to block unauthorized access. |
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|  | Q7. What do you mean by Device Driver?  Ans A **device driver** is a special type of software that allows your computer's operating system to **communicate with hardware devices**.  **Examples of Device Drivers:**   * **Printer Driver** – Lets the computer send print commands to a printer. * **Graphics Driver** – Controls how images and videos are displayed. * **Sound Driver** – Enables audio output through speakers or headphones. * **Network Driver** – Manages internet or network connections. |
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|  | Q1. What is Hardware Maintenance? Explain some guidelines for maintaining hardware?  Ans **Hardware Maintenance** refers to the process of regularly checking, cleaning, repairing, and upgrading the **physical components** of a computer system to ensure it works efficiently and lasts longer. Proper hardware maintenance improves system performance, prevents breakdowns, and increases the life span of your devices.  **Guidelines for Maintaining Hardware:**   1. **Keep Hardware Clean**    * Regularly dust off the computer, keyboard, and monitor using a soft cloth or air blower.    * Avoid eating or drinking near computers. 2. **Ensure Proper Ventilation**    * Keep the system in a cool, open space to avoid overheating.    * Clean air vents and fans regularly. 3. **Handle Devices Carefully**    * Avoid dropping or shaking hardware.    * Use surge protectors to prevent damage from power fluctuations. 4. **Use Original Accessories**    * Use genuine cables, chargers, and parts to avoid compatibility or safety issues. 5. **Regularly Check for Damage**    * Inspect cables, ports, and connectors for signs of wear or damage.    * Replace faulty hardware promptly. 6. **Update Firmware/Drivers**    * Keep device drivers and firmware up to date for better performance and compatibility. 7. **Shut Down Properly**    * Always turn off the computer using the operating system rather than unplugging it directly.     D: Long Answer Type Questions:  **Chapter-6: Computer System Maintenance**  Date  Page No. |
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| Q2 What are ports? Explain any two ports in detail?  Ans **Hardware ports** are physical interfaces on a computer or other electronic devices that allow you to connect peripherals (external devices) such as keyboards, mice, printers, external storage, monitors, and network cables. These ports serve as communication points where data is transmitted between the computer and the connected device.  There are various types of ports, each designed for specific purposes, with different shapes and data transfer capabilities.  **Two Common Hardware Ports Explained in Detail**  **1. USB (Universal Serial Bus) Port**  **Function:** USB ports are used to connect a wide range of devices such as keyboards, mice, printers, external hard drives, flash drives, smartphones, and more.  **Types:**   * **USB-A**: The most common rectangular port. * **USB-B**: Typically used for printers. * **USB-C**: Newer, reversible, and faster data transfer and charging. * **Micro-USB / Mini-USB**: Used mainly in older mobile devices.   **Features:**   * Plug and play support. * Supports hot swapping (devices can be connected/disconnected without restarting). * Can transmit both data and power. * Data transfer rates vary (USB 2.0 up to 480 Mbps, USB 3.0 up to 5 Gbps, USB 3.1 and above even faster).   **Use Case Example:**  Charging your phone or transferring files from a flash drive.  **2. HDMI (High-Definition Multimedia Interface) Port**  **Function:** HDMI ports are used to transmit high-quality audio and video signals from a device to a display like a TV, monitor, or projector.  **Features:**   * Supports both video and audio in a single cable. * Capable of transmitting high-definition and even 4K video. * Comes in standard, mini, and micro sizes. * Common in TVs, laptops, game consoles, and media players.   **Use Case Example:** Connecting a laptop to a projector for a presentation or linking a gaming console to a television. | **Chapter-6: Computer System Maintenance**  Date  Page No. |
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|  | **Chapter-6: Computer System Maintenance**  Q3. What do you mean by PC Security? Explain any two techniques to secure your PC.  Ans **PC Security** refers to the measures and techniques used to protect a personal computer (PC) and its data from unauthorized access, damage, theft, viruses, malware, and other security threats. It involves both hardware and software strategies to ensure the **confidentiality, integrity, and availability** of data and system functionality.  PC security is essential for protecting sensitive information, maintaining system performance, and preventing cyber-attacks.  **Two Techniques to Secure Your PC**  **1. Antivirus Software**  **Explanation:** Antivirus software is a program designed to detect, prevent, and remove malware (like viruses, worms, spyware, ransomware, etc.) from your PC. It regularly scans your files and system for malicious code and warns or automatically removes threats.  **Features:**   * Real-time protection. * Automatic updates to detect new viruses. * Quarantine and removal of infected files.   **Example:** Software like **Windows Defender**, **Norton Antivirus**, or **McAfee** protects your PC from threats you might encounter while browsing the internet or opening email attachments.  **2. Firewall**  **Explanation:** A firewall is a security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules. It acts as a barrier between your PC and potentially harmful external networks (like the internet).  **Types:**   * **Software firewall** (runs on your PC) * **Hardware firewall** (built into routers)   **Features:**   * Blocks unauthorized access. * Prevents hackers from gaining control of your system. * Can be customized to allow or block specific applications.   **Example:** The built-in **Windows Firewall** helps protect your PC by blocking suspicious activity from the internet.  Date  Page No. |
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| Q4. Differentiate between Update and Upgrade.  Ans Difference Between **Update** and **Upgrade**   | **Aspect** | **Update** | **Upgrade** | | --- | --- | --- | |  |  |  | | **Definition** | A small change or patch to fix bugs, improve security, or enhance features in existing software. | A major change that replaces the existing version with a newer, often significantly different version. | | **Purpose** | To fix issues, patch vulnerabilities, and improve performance. | To add new features, interface changes, or major improvements. | | **Scope** | Minor changes – typically within the same version. | Major changes – involves a new version or generation. | | **Example** | Updating Windows 10 with security patches. | Upgrading from Windows 10 to Windows 11. | | **Frequency** | Happens more frequently (weekly/monthly). | Happens less frequently (yearly or when major release occurs). | | **Cost** | Usually, free. | May be free or paid, depending on the software. |   **In simple terms:**   * **Update** = Small fix or improvement. * **Upgrade** = Big change or new version. | **Chapter-6: Computer System Maintenance**  Date  Page No. |
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|  | 1. Information Technology Act. 2000(India) comes into existence in INDIA on 2. **17th October 2000 ✅** C. 27th November 2003 3. 1st January 2006 D. 17th October 2009   ***Explanation*: The IT Act 2000 was notified on 17th October 2000, making it**  **the day it came into force.**   1. How E-Waste result in data theft ? 2. By Email Forwarding 3. **By Replacing Old electronics devices in Exchange without clearing data. ✅** 4. By Sharing Data 5. By using Wi-fi network   ***Explanation: Data stored in old devices can be recovered and misused if not properly erased before disposal.***   1. Plagiarism means \_\_\_\_\_\_\_\_\_ 2. **An Act of presenting another person’s work or ideas as your own. ✅** 3. A disease that affect humans and other mammals 4. A contagious bacterial characterized by fever. 5. None of Above.   ***Explanation: Plagiarism is using someone else’s intellectual property (ideas, words, work) without giving credit.***   1. Computer Vandalism\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. Action involving deliberate of or damage to property 3. **Malicious action that involves the destruction of computer and data ✅** 4. An action to protect computer from virus. D. None of Above.   ***Explanation: It refers to intentional harm or destruction of computer systems, programs, or data.***   1. On Which toll free number a complaint can be register with Punjab Cyber Crime Division in case of any online fraud? 2. 1911 **B) 1930** **✅** C) 1947 D) 1912   ***Explanation: 1930 is the national helpline number in India to report cyber fraud and financial fraud.***   1. Which Act in India Focus on Cyber Crime ? 2. Banking Regulation Act 1949 3. **IT Act 2000** **✅** 4. India Penal Code 1860 5. CrPC 1973   ***Explanation: The Information Technology Act 2000 is the primary law in India dealing with cybercrime and electronic commerce.***  A: Multiple Choice Questions:  **Chapter-7: Introduction to Cyber Security**  Date  Page No. |
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|  | 1. Any offence committed against a person or groups of people using digital gadget is known as \_ ***Cyber Crime***. \_\_\_\_\_\_\_\_\_\_ 2. **\_ Cyber Etiquette or Netiquette**\_ refers to the code of responsible behaviour on the internet. 3. E-Waste management using landfills pollute \_\_\_ ***soil and groundwater*** *\_\_\_\_*. 4. ***Cyber Espionage*** \_\_\_ is an act of secretly or stealthily gathering some important or secret information with revealing our internet. 5. CIA triad stands for **\_\_ Confidentiality\_\_,** Integrity, and Availability.   B: Fill in the Blanks:  **Chapter-7: Introduction to Cyber Security**  Date  Page No. |
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|  | C: Write True and False for the following statements: |
|  | 1. CIA triad stands for Confidentiality, Integrity and Availability. ✅ **True** 2. IT act in India came into force in the year 1995. ❌ **False** 3. E-waste is good for human health. ❌ **False** 4. Cyber Ethics ensure that users understand their responsibility for conducting themselves online. ✅ **True** 5. Hacking is used to expose vulnerabilities in system. ✅ **True** 6. Spying is an act of keeping a secret watch on various activities of opponents for intelligence purpose. ✅ **True** |
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|  | D: Short Answer Type Questions: |
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| Q1. Describe Cyber Crime.  Ans **Cybercrime** refers to criminal activities that involve the use of computers, digital devices, or networks. These crimes are committed through the internet or other forms of digital communication and can target individuals, organizations, or even governments. Cybercrime can range from simple scams to highly sophisticated attacks that cause major disruption or theft.  **Consequences of Cybercrime:** Financial loss, Loss of privacy and data, Reputation damage  Emotional distress, National security threats |  |
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| Q2. What do you mean by Hacking.  Ans **Hacking** refers to the act of gaining unauthorized access to computer systems, networks, or digital devices. It often involves bypassing security measures to steal, modify, or destroy data, or to disrupt services.  **Risks of Hacking:**   * Loss of sensitive data * Financial damage * Damage to reputation |  |
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A: Multiple Choice Questions:

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| Q3. Define with Phishing with example?  Ans **Phishing** is a type of cybercrime where attackers try to trick people into revealing sensitive information—such as usernames, passwords, credit card numbers, or bank account details—by pretending to be a trustworthy source, usually through email, SMS, phone calls, or fake websites.  **Example of Phishing:**  You receive an email that looks like it’s from your bank:  **Subject:** Urgent: Verify Your Account Now  Dear Customer,  We have detected unusual activity on your account. For your security, please verify your identity by clicking the link below:  [Click here to verify your account](http://fakebank123.com)  Failure to act within 24 hours will result in account suspension.  Thank you, Your Bank's Security Team  If you click the link, you may be taken to a fake website that looks like your bank’s login page. If you enter your username and password, the attackers will capture that information and could use it to steal money or commit fraud. | **Chapter-7: Introduction to Cyber Security**  Date  Page No. |
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|  | Q4. Explain CIA Triad  Ans The **CIA Triad** is a fundamental model in cybersecurity that represents the three core principles used to guide policies and practices for securing data and systems. **CIA** stands for: the **CIA Triad**—**Confidentiality, Integrity, and Availability**—forms the backbone of all cybersecurity efforts and helps ensure the secure handling of information in any organization. The CIA Triad provides a clear framework for thinking about cybersecurity risks and solutions. A breach in **any one** of these areas can lead to serious consequences, such as data leaks, fraud, system outages, or loss of trust.   1. **Confidentiality:**  Ensuring that information is accessible only to those authorized to have access. 2. **Integrity:** Ensuring that information is accurate and complete, and has not been altered without authorization. 3. **Availability:** Ensuring that authorized users have reliable access to information and systems when needed. |
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| Q5. What is Cyber Bullying?  Ans **Cyberbullying** is the use of digital technology—such as social media, messaging apps, websites, or gaming platforms—to harass, threaten, humiliate, or target another person. It is a form of bullying that takes place online and can be just as harmful as face-to-face bullying.  **Examples:**   * A student posts a mean comment about a classmate on Instagram. * Someone creates a fake profile pretending to be another person to post offensive content. * A person repeatedly sends insulting messages through a chat app or text.   Cyberbullying is a serious issue in today’s digital age. Just like traditional bullying, it can deeply affect a person’s mental and emotional well-being. Being respectful and kind online is essential to creating a safe internet environment for everyone. | **Chapter-7: Introduction to Cyber Security**  Date  Page No. |
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| Q6. What do you mean by Plagiarism?  Ans **Plagiarism** is the act of using someone else's work, ideas, or words without giving proper credit, and presenting it as your own. It is considered unethical and dishonest, whether done intentionally or unintentionally.  **Example of Plagiarism:**  **Original Text:** “Cyberbullying is a form of bullying that takes place over digital devices like phones or computers.”  **Plagiarized Version:** Cyberbullying happens when bullying occurs through phones or computers.  *(This is paraphrased but still copied without credit.)*  Plagiarism is a serious offense in both academic and professional settings. Always give credit to the original creators to maintain honesty, respect, and integrity in your work. |  |
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| Q7. Explain Identity Theft.  Ans **Identity theft** is a type of cybercrime where someone illegally obtains and uses another person's personal information—such as their name, Social Security number, credit card details, or bank account information—usually to commit fraud or other crimes.  **Examples of Identity Theft:**   * A thief uses your credit card number to make purchases. * Your social media or email account is taken over and used to scam others.   Identity theft is a serious crime that can damage your finances, reputation, and personal life. Staying alert, protecting your data, and acting quickly if your information is stolen are key to minimizing harm. |  |
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|  | **Chapter-7: Introduction to Cyber Security**  Date  Page No. |
| Q8. Describe the Various harmful effects of E-Waste.  Ans **E-waste** (electronic waste) refers to discarded electronic devices like old computers, mobile phones, TVs, batteries, and other gadgets. When not disposed of properly, e-waste poses serious risks to the **environment** and **human health**.  Improper disposal of e-waste has **serious and long-lasting effects** on our environment, health, and economy. Safe recycling, public awareness, and government regulations are essential to reduce the damage caused by e-waste. |  |
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| E: Long Answer Type Questions: |  |
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| Q1. What is Cyber Crime? Describe various types of Cyber Crime.  Ans **Cybercrime** refers to any illegal activity that involves the use of computers, digital devices, or the internet. Cybercriminals use technology to access, steal, damage, or manipulate data, systems, or networks for personal, financial, or political gain. Cybercrime is a serious and growing threat in the digital age. It affects individuals, businesses, and governments. Understanding the various types of cybercrime is the first step toward protecting yourself and others in the online world. Strong passwords, antivirus software, and awareness are key to staying safe.  **Types of Cybercrime:**   1. **Hacking:** Unauthorized access to a computer or network. Can be used to steal data, disrupt systems, or install malware.   **Example:** Breaking into a company’s server to steal customer information.   1. **Phishing:** Fraudulent attempts to trick people into giving personal information by pretending to be a trusted source. Usually done through fake emails or websites.   **Example:** A fake email from a "bank" asking for your login details.   1. **Identity Theft:** Stealing someone’s personal information (e.g., name, ID number, credit card details) to commit fraud or crimes in their name.   **Example:** Using someone else’s identity to apply for a loan.   1. **Cyberbullying:** Using digital platforms to harass, threaten, or humiliate others. Common on social media, messaging apps, and gaming platforms.   **Example:** Posting insulting or threatening messages online.   1. **Online Fraud and Scams:** Deceiving people to steal money or information. Includes fake shopping websites, lottery scams, and job scams.   **Example:** Paying for a product online that never gets delivered. |  |
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|  | Q2. Explain Cyber Safety. What are the preventive measures to tackle Cyber Crime?  Ans **Cyber Safety** refers to the practices, strategies, and precautions taken to protect yourself, your data, and your devices while using the internet and digital technologies. It involves staying safe from online threats like cybercrime, cyberbullying, identity theft, and data breaches. Cyber safety is essential in today’s digital world to protect yourself and your information. By following preventive measures and staying aware of cyber risks, you can greatly reduce your chances of falling victim to cybercrime.  **Preventive Measures to Tackle Cybercrime:**  **1. Use Strong Passwords**   * Create complex passwords with letters, numbers, and symbols. * Avoid using easily guessable passwords like birthdays or “123456.” * Change passwords regularly.   **2. Enable Two-Factor Authentication (2FA)**   * Adds an extra layer of security by requiring a second verification step (like a code sent to your phone).   **3. Keep Software Updated**   * Regularly update your operating system, apps, and antivirus software to fix security vulnerabilities.   **4. Be Cautious with Emails and Links**   * Don’t open emails or attachments from unknown senders. * Avoid clicking on suspicious links or pop-ups.   **5. Use Secure Networks**   * Avoid public Wi-Fi for sensitive transactions. * Use VPNs (Virtual Private Networks) to encrypt your internet connection.   **Chapter-7: Introduction to Cyber Security**  Date  Page No. |
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|  | Q3. Define Cyber Ethics. What are the principals of Cyber Ethics.  Ans **Cyber Ethics** refers to the moral principles and guidelines that govern the behaviour of individuals when using computers, the internet, and digital technologies. It focuses on using technology responsibly, respecting others’ rights, and ensuring fairness and safety online.  **Principles of Cyber Ethics:**   1. **Respect Others’ Privacy**    * Do not access or share someone else’s personal information without permission. 2. **Do Not Harm Others**    * Avoid cyberbullying, harassment, or spreading false information that can hurt people. 3. **Respect Intellectual Property**    * Do not steal or copy software, music, videos, or written content without proper authorization or giving credit. 4. **Use Technology Fairly and Legally**    * Follow laws related to cybercrime and do not engage in hacking, identity theft, or unauthorized access. 5. **Be Honest and Truthful**    * Avoid lying, cheating, or misrepresenting yourself online. 6. **Protect Your Own and Others’ Security**    * Use strong passwords, update software, and avoid risky online behaviour that can compromise safety. 7. **Respect Others’ Rights to Freedom of Expression**    * Allow others to share their views, but do so respectfully and without spreading hate speech or offensive content. 8. **Practice Accountability**    * Take responsibility for your actions online and understand the consequences.   **Chapter-7: Introduction to Cyber Security**  Date  Page No. |
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| Q4. What do you mean by E-Waste? Explain various methods of disposing E-Waste.  Ans **E-Waste** (Electronic Waste) refers to discarded electronic devices or components that are no longer useful or working. This includes items like old computers, mobile phones, televisions, printers, batteries, and other electronic appliances. E-waste contains **toxic materials** such as lead, mercury, and cadmium. If not disposed of properly, it can pollute the environment and harm human health. However, it also contains **valuable materials** like gold, copper, and aluminum that can be recovered through proper recycling.  **Methods of Disposing E-Waste:**  **1. Recycling**   * **Process:** E-waste is collected, dismantled, and useful materials like metals, plastics, and glass are separated and reused. * **Benefit:** Reduces pollution and saves natural resources. * **Example:** Recycling old smartphones to extract gold and copper.   **2. Reuse and Refurbishing**   * **Process:** Old devices are repaired and upgraded for further use. * **Benefit:** Extends the life of electronic products and reduces waste. * **Example:** Donating an old but working laptop to a school or charity.   **3. Incineration**   * **Process:** E-waste is burned at high temperatures to reduce volume. * **Benefit:** Reduces the amount of waste in landfills. * **Drawback:** Can release harmful gases if not properly managed.   **4. Landfilling (Not Recommended)**   * **Process:** Dumping e-waste in landfills. * **Drawback:** Toxic substances can leach into soil and water, causing serious environmental damage.   **5. Take-Back Programs**   * **Process:** Many companies offer to take back old electronics for safe recycling or disposal. * **Example:** Mobile phone brands collecting old phones for recycling.   **6. Exchange or Buy-Back Programs**   * **Process:** Some manufacturers offer discounts or money in exchange for old devices when buying a new one. * **Benefit:** Encourages responsible disposal and recycling | **Chapter-7: Introduction to Cyber Security**  Date  Page No. |
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