

CLASS – XI
COMPUTER SCIENCE

Unit-Wise weightage**Part – A External****Marks: 70**

Unit	Topics	Marks
I	Computer System and Organisation	10
II	Computational Thinking and Programing-1	45
III	Society, Law and Ethics	15
Total		70

Part – A: External**UNIT 1: Computer System and Organisation****10 marks****Basic Computer Organisation:**

- **Basic Computer Organisation:** Introduction to computer system, Fundamentals, Hardware, Software, Computer System Architecture, Memory, Stored Program Concept, Programming Tools.
- **Number system:** Introduction, Decimal Number System, Binary Numbers, Octal Numbers, Hexadecimal Number System, Octal and Hexadecimal to Binary and Vice-versa.
- **Boolean Algebra and Logic Gates:** Introduction, Boolean Variable, Boolean Operators, Truth Table, Logic Gates, Basic Logic Gates from Universal Gates, Properties of Boolean Algebra, De-Morgan's Laws.
- **Codes:** Introduction, ASCII Code, ISCII Code, Unicode,

Unit II: Computational Thinking and Programming -1**45 marks**

- **Introduction to Problem Solving:** Introduction, Steps for Problem Solving, Problem Solving Using Decomposition, Algorithm, Algorithms: Definition and Characteristics, Pseudo Code and Flow Chart.
- **Familiarization with the Basics of Python Programming:** Introduction to Python, Features of Python, The Paradigms, Chronology, Installation of Anaconda.
- **Fundamentals of Python:** Introduction, Basic Input Output, Program Execution, The Jupyter Notebook, Value Type and Reference Type, Python Character Set: Tokens, Keywords, Identifiers, Literals and Punctuators, Statements, Comments, Operators, Types and Examples of Operators, Basic Data Types, Errors, Flow of Control.
- **List:** Introduction, Lists, Eval() Function, Accessing Elements: Indexing and Slicing, Mutability, List Operations, Traversing List Using Loops, Making a True Copy of a List, Functions, Illustrations.

- **Tuples:** Introduction, Tuple, Indexing and Slicing, Non-Mutability, Tuple Operations, Traversal, Functions.
- **Dictionary:** Introduction, Associative Arrays and Dictionaries, Displaying Elements of a Dictionary, Important Points Regarding Dictionary, Some Important Built-in Functions of Dictionaries, Input from the User, Making a Shallow Copy of a Dictionary, Illustrations.
- **Strings:** Introduction, Traversing String Using Loops, String Operations, In-built Functions, Illustrations
- **Conditional statements:** Introduction, 'if', if-else, if-elif-else Constructs, The if-elif-else Ladder, Logical Operators, The Ternary Operator, The Get Construct, Examples.
- **Looping:** Introduction, Looping Constructs, Range, Break and Continue, Illustrations, while-else, Nested Loops, Generating Patterns.
- **Introduction to Python Modules:** Introduction, Creating Modules and Packages in Python, Accessing Objects of a Module, Math, Random and Statistics Modules, NumPy.

Unit III: Society, Law and Ethics

15 marks

- **Society, Law and Ethics-I:** Introduction, Malware, Virus, Worms, Trojans, Spyware, Adware, Cookies, Digital Footprints, Cyber Crime, Cyber Bullying, Identity Thefts, Phishing, Pharming, PC Intrusion, Eavesdropping, Trolling, Spamming, Spreading Rumours, Credit Card Frauds, Cyber Stalking, Illegal Downloading and Digital Piracy, Child Pornography, How to Prevent Computer Viruses, How to Prevent Phishing, How to Prevent Pharming, How to Prevent Eavesdropping, How to Prevent Spamming, Firewall, Authentication, Social Media: Common Networking Sites and Appropriate usage, Social Media Etiquettes, Safely Browsing the Internet, Information Technology Act 2000.
- **Society, Law and Ethics-II:** Introduction, Plagiarism, Intellectual Property, Copyright Infringement, Trademark Infringement, Licensing, Open Movement: Open Data and Open Source, Technology and Society, Education for All, Electronic Waste Management.

Part – B: Practical

30 Marks

Sl no	Unit Name	Marks
1.	Lab Test (12 marks) Python program (60% logic + 20% documentation + 20% code quality)	12
2.	Report File + viva (10 marks) <ul style="list-style-type: none"> • Report file: Minimum 20 Python programs. • Viva voce 	7 3
3.	Project (that uses most of the concepts that have been learnt) (See CS-XII for the rules regarding the projects)	8

Suggested Practical list:

Python Programming

- Input a welcome message and display it.
- Input two numbers and display the larger / smaller number.
- Input three numbers and display the largest / smallest number.
- Generate the following patterns using nested loop

Pattern 1	Pattern 2	Pattern 3
*	1 2 3 4 5	A
**	1 2 3 4	AB
***	1 2 3	ABC
****	1 2	ABCD
*****	1	ABCDE

- Write a program to input the value of x and n and print the sum of the following series:
 - $1 + x + x^2 + x^3 + x^4 + \dots x^n$
 - $1 - x + x^2 - x^3 + x^4 \dots x^n$
 - $x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots \frac{x^n}{n}$
 - $x + \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} \dots \frac{x^n}{n!}$
- Determine whether a number is a perfect number, an armstrong number or a palindrome.
- Input a number and check if the number is a prime or composite number.
- Display the terms of a Fibonacci series.
- Compute the greatest common divisor and least common multiple of two integers.
- Count and display the number of vowels, consonants, uppercase, lowercase characters in string.
- Input a string and determine whether it is a palindrome or not; convert the case of characters in a string.
- Find the largest/smallest number in a list/tuple
- Input a list of numbers and swap elements at the even location with the elements at the odd location.
- Input a list/tuple of elements, search for a given element in the list/tuple.
- Input a list of numbers and find the smallest and largest number from the list.
- Create a dictionary with the roll number, name and marks of n students in a class and display the names of students who have scored marks above 75.