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Subject: Computer Science (Deleted)

Class: 11

Units	Topic/Portion deleted
Unit I: Computer Systems and Organisation	<ul style="list-style-type: none"> ● Encoding Schemes : UTF8, UTF32 ● Concept of cloud computing and cloud services (SaaS,IaaS,PaaS), cloud (public/private), Blockchain technology ● Boolean logic: NOT, AND, OR, NAND, NOR, XOR, NOT, truth tables and De Morgan's laws, Logic circuits ● Encoding Schemes : ASCII, ISCII and Unicode
Unit II: Computational Thinking and Programming - 1	<p>Decomposition – concept, need for decomposing a problem, examples of problem solving using decomposition.</p> <ul style="list-style-type: none"> ● Sorting algorithm: bubble and insertion sort; count the number of operations while sorting. ● using flowcharts, suggested programs: calculation of simple and compound interests, finding the factorial of a positive number etc <p>Suggested Practical List Input a list of elements, sort in ascending/ descending order using Bubble/ Insertion sort</p>
Unit-III: Society, Law and Ethics	<ul style="list-style-type: none"> ● Intellectual property rights, plagiarism, digital rights management, and licensing (Creative Commons, GPL and Apache), open source, open data, privacy. <p>Technology and society:</p> <ul style="list-style-type: none"> ● understanding of societal issues and cultural changes induced by technology. ● E-waste management: proper disposal of used electronic gadgets. ● Identity theft, unique ids and biometrics. ● Gender and disability issues while teaching and using computers.

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**Revised Computer Science
CLASS-11
THEORY: 70 MARKS**

Learning Outcomes

- ✓ Ability to understand and apply basic computational thinking.
- ✓ Ability to understand the notion of data types and data structures and apply in different situations.
- ✓ Ability to appreciate the notion of an algorithm and apply its structure including how algorithms handle corner cases.
- ✓ Ability to develop a basic understanding of computer systems - architecture, operating system, mobile and cloud computing.
- ✓ Ability to work in the cyber world with understanding of cyber ethics, cyber safety and cybercrime.
- ✓ Ability to make use the value of technology in societies, gender and disability issues and the technology behind biometric ids.

Distribution of Marks

Unit No.	Unit Name	TheoryMarks
I	Computer Systems and Organisation	10
II	Computational Thinking and Programming - 1	45
III	Society, Law and Ethics	15
Total		70

Unit I: Computer Systems and Organisation

10 Marks

- Basic computer organisation: description of a computer system and mobile system, CPU, memory, hard disk, I/O, battery.
- Types of software: Application software, System software and Utility software.
- Memory Units: bit, byte, MB, GB, TB, and PB.
- Number System: numbers in base 2, 8, 16 and binary addition.
- Concept of Compiler and Interpreter
- Operating System (OS) - need for an operating system, brief introduction to functions of OS, user interface

Unit II: Computational Thinking and Programming – 1

45 Marks

Introduction to Problem solving: Problem solving cycle - Analysing a problem, designing algorithms and representation of algorithm using flowchart and pseudo-code.

Familiarization with the basics of Python programming: a simple “hello world” program, the process of writing a program (Interactive & Script mode), running it and print statements; simple data-types: integer, float and string.

- Features of Python, Python Character Set, Token & Identifiers, Keywords, Literals, Delimiters, Operators.
- **Comments:** (Single line & Multiline/ Continuation statements), Clarity & Simplification of expression

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- Introduce the notion of a variable and methods to manipulate it (concept of L-value and R-value even if not taught explicitly).
- **Knowledge of data types and operators:** accepting input from the console, assignment statement, expressions, operators and their precedence.
- **Operators & types:** Binary operators-Arithmetic, Relational Operators, Logical Operators, Augmented Assignment Operators.
- Execution of a program, errors- syntax error, run-time error and logical error.
- **Conditional statements:** if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number.
- **Notion of iterative computation and control flow:** for(range(),len()), while,
- **Strings:** Traversal, operations – concatenation, repetition, membership; functions/methods–len(), capitalize(), title(), upper(), lower(), count(), find(), index(), isalnum(), islower(), isupper(), isspace(), isalpha(), isdigit(), split(), partition(), strip(), lstrip(), rstrip(), replace(); String slicing.
- **Lists:** Definition, Creation of a list, Traversal of a list. Operations on a list - concatenation, repetition, membership; functions/methods–len(), list(), append(), extend(), insert(), count(), index(), remove(), pop(), reverse(), sort(), min(), max(), sum(); Lists Slicing; Nested lists; finding the maximum, minimum, mean of numeric values stored in a list; linear search on list of numbers and counting the frequency of elements in a list.
- **Tuples:** Definition, Creation of a Tuple, Traversal of a tuple. Operations on a tuple - concatenation, repetition, membership; functions/methods –len(), tuple(), count(), index(), sorted(), min(), max(), sum(); Nested tuple; Tuple slicing; finding the minimum, maximum, mean of values stored in a tuple; linear search on a tuple of numbers, counting the frequency of elements in a tuple.
- **Dictionary:** Definition, Creation, Accessing elements of a dictionary, add an item, modify an item in a dictionary; Traversal, functions/methods – len(), dict(), keys(), values(), items(), get(), update(), del(), del, clear(), fromkeys(), copy(), pop(), popitem(), setdefault(), max(), min(), count(), sorted() copy(); Suggested programs : count the number of times a character appears in a given string using a dictionary, create a dictionary with names of employees, their salary and access them.
- **Introduction to Python modules:** Importing math module (pi, e, sqrt, ceil, floor, pow, fabs, sin, cos, tan); random module (random, randint, randrange),

Unit III: Society, Law and Ethics

15 Marks

- **Cyber safety:** safely browsing the web, identity protection, confidentiality, social networks, cyber trolls and bullying.
- **Appropriate usage of social networks:** spread of rumours, and common social networking sites (Twitter, LinkedIn, and Facebook) and specific usage rules.
- **Safely accessing web sites:** adware, malware, viruses, Trojans
- **Safely communicating data:** secure connections, eavesdropping, phishing and identity verification.
- **Privacy laws, fraud;** cyber-crime- phishing, illegal downloads, child pornography, scams; cyber forensics, IT Act, 2000.

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SUBJECT : Computer Science (Practical) **Max. marks : 10**
Class : 11 **Time : 3 hours**
No. of paper : 1(One)

There must be three sets of questions for practical in Python programming. Students have to choose one set of question and tested in computer during examination.

1. **Programming in Python** **: 8 marks**
 - a. Marks are allotted on the basis of the following
 - i. Logic **: 5 marks**
 - ii. Output presentation **: 3 marks**
2. **Viva Voce** **: 2 marks**

Suggested Practical List for Python Programming

- 1) Input a welcome message and display it.
- 2) Input two numbers and display the larger / smaller number.
- 3) Input three numbers and display the largest / smallest number.
- 4) Given two integers x and n, compute x^n .
- 5) Write a program to calculate the surface area of a sphere using the formula

$$\text{Surface Area } S = 4\pi r^2$$
- 6) Write a program to demonstrate the working of if...else statement.
- 7) Write a program to input the value of x and n and print the sum of the following series:
 - a) $1 + 2 + 3 + \dots + n$
 - b) $x + x^2 + x^3 + x^4 + \dots + x^n$
 - c) $x/1 + x^2/2 + x^3/3 + x^4/4 + \dots + x^n/n$
 - d) $1! + 2! + 3! + \dots + n!$
- 8) Input a number and check if the number is odd or even number
- 9) Determine whether a number is a palindrome or not.
- 10) Display the terms of a Fibonacci series.
- 11) Count and display the number of characters in a string.
- 12) Input a string and convert all characters to upper case.
- 13) Find the largest/smallest number in a list/tuple.
- 14) Write a program to swap two numbers.
- 15) Write a program to illustrate user defined function in python.
- 16) Input a list/tuple of elements, search for a given element in the list/tuple.
- 17) Create a dictionary with the roll number and name of n students in a class and display.