RUBY PARK PUBLIC SCHOOL

SYLLABUS FOR THE ACADEMIC SESSION 2022-23

Subject - Computer Science

CLASS - XI

Month	Topic	Sub-Topic
June	Introduction to Problem Solving	Steps for problem solving (analysing the problem, developing an algorithm, coding, testing and debugging). representation of algorithms using flow chart and pseudo code, decomposition
	Computer System Overview	Basic Computer Organisation: Introduction to computer system, hardware, software, input device, output device, CPU, memory (primary, cache and secondary), units of memory (Bit, Byte, KB, MB, GB, TB, PB)
		Types of software: system software (operating systems, system utilities, device drivers), programming tools and language translators (assembler, compiler & interpreter), application software
		Operating system (OS): functions of operating system, OS user interface. Encoding schemes: ASCII, ISCII and UNICODE (UTF8, UTF32)
		Emerging trends: Cloud computing, cloud services (SaaS, IaaS, PaaS), blockchains, Artificial Intelligence (AI), Machine Learning (ML), Internet of Things (IoT)
June / July	Data Representation	Binary, Octal, Decimal and Hexadecimal number system; conversion between number systems.
	Boolean Logic	Boolean logic: NOT, AND, OR, NAND, NOR, XOR, truth table, De Morgan's laws and logic circuits
Unit Test – I		
July	Getting Started with Python	Introduction to Python, features of Python, executing a simple "hello world" program, execution modes: interactive mode and script mode, Python character set, Python tokens (keyword, identifier, literal, operator, punctuator), variables, concept of l-value and R-value, use of comments

	Python Fundamentals	Knowledge of data types: number (integer, floating point, complex), Boolean, sequence (string, list, tuple), none, mapping (dictionary), mutable and immutable data types
	Data Handling	arithmetic operators, relational operators, logical operators, assignment operator, augmented assignment operators, identity operators (is, is not), membership operators (in, not in)
		Expressions, statement, type conversion & input/output: precedence of operators, expression, evaluation of expression, python statement, type conversion (explicit & implicit conversion), accepting data as input from the console and displaying output.
August	Conditional And Iterative Statements	Flow of control: introduction, use of indentation, sequential flow, conditional and iterative flow control
August	Conditional And Iterative Statements	Conditional statements: if, if-else, if-elif-else, flowcharts, simple programs: e. g.: absolute value, sort 3 numbers and divisibility of a number
		Iterative statements: for loop, range function, while loop, flowcharts, break and continue statements, nested loops, suggested programs: generating pattern, summation of series, finding the factorial of a positive number etc
	String Manipulation	introduction, indexing, string operations (concatenation, repetition, membership & slicing), traversing a string using loops, built-in functions: len(), capitalize(), title(), lower(), upper(), count(), find(), index(), endswith(), startswith(), isalnum(), isalpha(), isdigit(), islower(), isupper(), isspace(), lstrip(), rstrip(), strip(), replace(), join(), partition(), split()
September	Block Test I	
October	Debugging Pro - grams	Errors: syntax errors, logical errors, runtime errors
	List Manipulation	introduction, indexing, list operations (concatenation, repetition, membership & slicing), traversing a list using loops, built-in functions: len(), list(), append(), extend(), insert(), count(), index(), remove(), pop(), reverse(), sort(), sorted(), min(), max(), sum(); nested lists, suggested programs: 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
November	Tuples	introduction, indexing, tuple operations (concatenation, repetition, membership & slicing), built-in functions: len(), tuple(), count(), index(), sorted(), min(), max(), sum(); tuple assignment, nested tuple, suggested programs: 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
	Unit Test – II	
December	Dictionaries	introduction, accessing items in a dictionary using keys, mutability of dictionary (adding a new item, modifying an existing item), traversing a dictionary, built-in functions: len(), dict(), keys(), values(), items(), get(), update(), 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
December	Introduction to Python modules	Importing module using 'import <module>' and using from statement, importing math module (pi, e, sqrt, ceil, floor, pow, fabs, sin, cos, tan); random module (random, randint, randrange), statistics module (mean, median, mode)
Unit Test – III		
January	Cyber Safety	Digital Footprints
		Digital society and Netizen: net etiquettes, communication etiquettes, social media etiquettes
		Data protection: Intellectual Property Right (copyright, patent, trademark), violation of IPR (plagiarism, copyright infringement, trademark infringement), open-source software and licensing (Creative Commons, GPL and Apache)
		Cyber-crime: definition, hacking, eavesdropping, phishing and fraud emails, ransomware, preventing cyber crime
		Cyber safety: safely browsing the web, identity protection, confidentiality, cyber trolls and bullying.
		Safely accessing web sites: malware, viruses, trojans, adware
		E-waste management: proper disposal of used electronic gadgets
		Indian Information Technology Act (IT Act)
		Technology & Society: Gender and disability issues while teaching and using computers
Revision		
Block Test – II