केंद्रीय विद्यालय संगठन

KENDRIYA VIDYALAYA SANGATHAN

कोलकाता संभाग /KOLKATA REGION

तत् त्वं पूषन् अपावृणु

केन्द्रीय विद्यालय संगठन

पाठ्यक्रम विभाजन एवं प्रायोगिक कार्य हेतु

दिशा निर्देश

SPLIT-UP SYLLABUS
&
GUIDELINES FOR PRACTICALS

[CLASS XI]

COMPUTER SCIENCE (083)

(Based on CBSE Revised curriculum 2019-20)

KENDRIYA VIDYALAYA SANGATHAN, KOLKATA REGION

SPLIT-UP SYLLABUS FOR COMPUTER SCIENCE (083) CLASS - XI

(NEW SYLLABUS)

(Session 2019-20 onward)

DISTRIBUTION OF MARKS

Unit No.	UnitName	Marks	Periods	
			Theory	Practical
1.	Computer Systems and Organization	10	10	2
2.	Computational Thinking and Programming	35	60	45
3.	Data Management–1	15	30	23
4.	Society, Law and Ethics–1	10	10	--
5.	Practical	30		
	Total	100	110	70

MONTH- WISE DISTRIBUTION

Month	Topics to be covered	Th.	Pr.
June	**Unit 1: Computer Systems and Organization (CSO)** Basic computer organization: description of a computer system and mobile system, CPU, memory, hard disk, I/O, battery. • Types of software: application, System, utility. • Memory Units: bit, byte, MB, GB, TB, and PB. • Boolean logic: OR, AND, NAND, NOR, XOR, NOT, truth tables, De Morgan's laws • Information representation: numbers in base 2, 8, 16, binary addition • Strings: ASCII, UTF8, UTF32, ISCII (Indian script code), Unicode • Basic concepts of Flowchart • Concept of Compiler & Interpreter • Running a program: Notion of an operating system, how an operating system runs a program, idea of loading, operating system as a resource manager. • Concept of cloud computing, cloud(public/private), introduction to parallel computing.	10	2
July	**Unit 2: Computational Thinking andProgramming** Basics of Computational Thinking: Decomposition, Pattern Recognition/Data representation, Generalization/Data Abstraction and algorithm. Familiarization with the basics of Python programming: a simple "hello world" program, process of writing a program (Interactive & Script mode), running it, and print statements; simple data-types: integer, float, string. • Features of Python, Python Character Set, Token & Identifiers, Keywords, Literals, Delimiters, operators. • Comments: Single line &Multiline/Continuation statements), Clarity &Simplification of expression. • 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.	25	10

August	• Operators &types: Binary Operators-Arithmetic, Relational operators, Logical Operators, Augmented Assignment operators. • Conditional statements: if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort 3numbers, and divisibility. • Notion of iterative computation and control flow: for (range(), len()),while, flowcharts, suggested programs: Interest calculation and factorials, etc.	15	15
	First Periodic Test (26 – 31 August) –MM: 50		
September	• Idea of debugging: errors and exceptions; debugging: pdb, breakpoints. • Lists, tuples and dictionary: finding the maximum, minimum, mean; linear search on list/tuple of numbers, and counting the frequency of elements in a list using a dictionary. Introduce the notion of accessing elements in a collection using numbers and names. • Sorting algorithm: bubble and insertion sort; count the number of operations while sorting.	10	10
October	• Strings:Traversing,compare,concat,substring. • Introduction to Python modules: Importing math (sqrt, cell, floor, pow, fabs, sin, cos, tan, random (random, randint, randrange), statistics (mean, median, mode)modules.	10	10
	Half Yearly Examination (04-09 November)- Theory (70) + Practical (30)		
November	**Unit 3: Data Management (DM-1)** • Relational databases: Concept of a database, relations, attributes and tuples, keys- candidate key, primary key, alternate key, foreign key; Degree and cardinality of a table. • Use SQL – DDL/ DML commands to CREATE TABLE, INSERT INTO, UPDATE TABLE, DELETE FROM, ALTER TABLE,MODIFY TABLE, DROP TABLE, keys, and foreign keys; to view content of a table: SELECT-FROM- WHERE-ORDER BY alongwith BETWEEN, IN, LIKE, (Queries only on single table)	20	15
Decem ber	• Aggregate functions – MIN,MAX,AVG,COUNT,SUM • Basics of NoSQL databases. **UNIT 4: Society, Law and Ethics (SLE-1)- Cyber Safety** • Cyber safety: safely browsing the web, identity protection, confidentiality, social networks, cyber trolls and bullying	10 2	8
January	• Appropriate usage of social networks: spread of rumors, and common social networking sites(Twitter, LinkedIn and Facebook)and specific usage rules. • Safely accessing websites: adware, malware, viruses, Trojans • Safely communicating data: secure connections, eavesdropping, and phishing and identity verification.	8	

	2nd Periodic Test (16-22 Jan) M.M.- 50		
February	Revision, Project Work, Session Ending Practical Examination		
	Practical/ Project for Session Ending Examination (14-20 Feb)		
March	**Session Ending Examination (Full Syllabus)**		

Note: No. of working days* (Tentative):

June	11
July	26
August	17
September	22
October	15
November	17
December	17
January	10

*Excluding Examination days.

GUIDELINES FOR PRACTICAL WORK

COMPUTER SCIENCE (083)

CLASS - XI (NEW SYLLABUS)

DISTRIBUTION OF MARKS

Sl. No.	UNITNAME	MARKS
1	**Lab Test (12 marks)**	
	Python programs to test PCT (60% logic + 20% documentation +20% code quality)	8
	SQL program (at least 4 queries)	4
2	**Report File + viva (10 marks)**	
	Report file: Minimum 20 Python programs (PCT + DH) and at least 8 SQL commands	7
	Viva voce (based on the report file)	3
3	**Project Work (that uses most of the concepts that have been learnt)** **Project may be allotted to group of 2-3 students.**	8

Programming in Python: At least the following Python concepts should be covered in the lab sessions: expressions, conditionals, loops, list, dictionary, and strings. The following are some representative lab assignments.

- Find the largest and smallest numbers in a list.
- Find the third largest number in a list.
- Test for primarily
- Find whether a string is a palindrome or not.
- Given two integers x and n, compute x^n.
- Compute the greatest common divisor and the least common multiple of two integers.
- Test if a number is equal to the sum of the cubes of its digits. Find the smallest and largest such numbers.

Data Management: SQL Commands At least the following SQL commands should be covered during the labs: create, insert, delete, select, and join. The following are some representative assignments.

- Create a student table with the student id, name, and marks as attributes where the student id is the primary key.
- Insert the details of a new student in the above table.
- Delete the details of a particular student in the above table.
- Use the select command to get the details of the students with marks more than 80.
- Create a new table (name, date of birth) by joining two tables (student id, name) and (student id, date ofbirth).
- Create a new table (orderID, customerName, and orderDate) by joining two tables (orderID, customerID, and orderDate) and (customerID, customerName, contact Name, country).

SUGGESTIVE LIST OF PROGRAMS (LAB WORK)

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[Minimum 20 Programs from Python Programming & 8 SQL queries - covering all the topics must be tested in the Lab and recorded on Practical copy with flow charts, as applicable.]

1. Write a Python program to accepts two integers and print their sum.
2. Write a Python program that accepts radius of a circle and prints its area.
3. Write a Python program that inputs a student's marks in five subjects (out of 100) and prints the total marks and percentage of marks.
4. Write a Python program to accept length and width of a rectangle and compute its perimeter and area.
5. Write a Python program to compute simple interest for given Principal amount, time and rate of interest.
6. Write a Python program to find whether a given number is even or odd?
7. Write a Python program to find largest among three numbers.
8. Write a Python program to print roots of a quadratic equation $ax^2 + bx +c=0$ (where $a\neq0$).
9. Write a Python program to perform arithmetic calculation. This program accepts two operands and an operator then displays the calculated result.
10. Write a Python program to check whether a given year is leap year or not.
11. Write a Python program to print table of a given number.
12. Write a Python Program to print first n Natural numbers and their sum.
13. Write a Python Program to accept two integers X and N, compute X^N
14. Write a Python Program to calculate factorial of given number using while loop.
15. Write a program to print Fibonacci series. i.e. 0 1 1 2 3 5 8…
16. Write a Python program to check whether a given number is equal to the sum of the cubes of its digits.
17. Write a program to print following pattern on screen.

```
    *
  * * *
* * * * *
* * * * *
   * *
```

18. Program to add the odd numbers up to (and including) a given value N and print the result.
19. Compute the greatest common divisor and the least common multiple of two integers.
20. Write a Python program to generate prime numbers for given range.
21. Write a Python Program to read a sentence and count number of alphabets, digits, spaces and other characters.
22. Write a Python Program to check whether the given string is palindrome or not.
23. Write a Python program to input numbers and create two tuples containing even and odd numbers.
24. Write a Python Program to input some numbers in a tuples and create second tuple which contain only unique values (non-repeating) values from the first tuple.
25. Write a Python program to create a tuple storing prime numbers in given range.
26. Write a Python program to calculate mean of a given list of numbers.
27. Write a Python program to count the frequency of a given number in alist.
28. Write a Python program to create Phone Directory (mobile number and name) using dictionary and search and display name for given mobile number.
29. Write a Python program to sort a list of 10 numbers using Bubble Sort method.
30. Write a Python program to sort a list of 10 numbers using Insertion Sort method.

SQL Commands (At least 15 SQL queries related to create, insert, delete, select, and join operation etc. should be covered during the lab activities: