SYLLABUS – 2024- 2025

CLASS – **XII**

SUBJECT – **COMPUTER SCIENCE**

Total Marks – 70 **Practical - 30**

COURSE STRUCTURE

Unit I: Computational Thinking and Programming – 2

● Revision of Python topics covered in Class XI.

● Functions: types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope)

● Exception Handling: Introduction, handling exceptions using try-except-finally blocks

● Introduction to files, types of files (Text file, Binary file, CSV file), relative and absolute paths

● Text file: opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text file

● Binary file: basic operations on a binary file: open using file open modes (rb, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load() method, read, write/create, search, append and update operations in a binary file

● CSV file: import csv module, open / close csv file, write into a csv file using writer(),writerow(),writerows() and read from a csv file using reader()

● Data Structure: Stack, operations on stack (push & pop), implementation of stack using list.

Unit II: Computer Networks

● Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)

● Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)

● Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves)

● Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)

● Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)

● Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP

● Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting

Unit III: Database Management

● Database concepts: introduction to database concepts and its need

● Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key)

● Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command, aggregate functions (max, min, avg, sum, count), group by, having clause, joins: cartesian product on two tables, equi-join and natural join

● Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using connect(), cursor(), execute(), commit(), fetchone(), fetchall(), rowcount, creating database connectivity applications, use of %s format specifier or format() to perform queries

SUGGESTED PRACTICAL LIST

Python Programming

●Read a text file line by line and display each word separated by a #.

● Read a text file and display the number of vowels/consonants/uppercase/lowercase characters in the file.

● Remove all the lines that contain the character 'a' in a file and write it to another file.

● Create a binary file with name and roll number. Search for a given roll number and display the name, if not found display appropriate message.

● Create a binary file with roll number, name and marks. Input a roll number and update the marks.

● Write a random number generator that generates random numbers between 1 and 6 (simulates a dice).

● Write a Python program to implement a stack using list.

● Create a CSV file by entering user-id and password, read and search the password for given user id.

Database Management

● Create a student table and insert data. Implement the following SQL commands on the student table:

- ALTER table to add new attributes / modify data type / drop attribute
- UPDATE table to modify data
- ORDER By to display data in ascending / descending order
- DELETE to remove tuple(s)
- GROUP BY and find the min, max, sum, count and average

● Similar exercise may be framed for other cases.

● Integrate SQL with Python by importing suitable module.

SUGGESTED READING MATERIAL

- NCERT Textbook for COMPUTER SCIENCE (Class XII)

HALF YEARLY/ PRE-BOARD/ BOARD FINAL EXAMINATION: 2024-2025
BLUE PRINT OF DISTRIBUTION OF MARKS

Sl No	Topic	MCQ (1)	VSA (1)	SA I (2)	SA II (3)	LA I (4)	LA II (5)	Total Marks
I	Computational Thinking & Programming II	1x6	1x5	2x2	3x1	4x3	5x2	40
II	Computer Networks	1x2	1x2	2x3	-	-	-	10
III	Database Management	1x2	1x2	2x3	-	-	5x2	20
Total Marks (Questions)		**1x10 (10)**	**1x9 (9)**	**2x8 (8)**	**3x1 (1)**	**4x3 (3)**	**5x4 (4)**	**70 (35)**

MARKS DISTRIBUTION FOR PRACTICAL EXAMINATION: 30 MARKS

1. Actual Experiment - 20 Marks
2. Viva voce - 02 Marks
3. Lab Note Book - 03 Marks
4. Attendance - 05 Marks

Total :- 30 Marks