

CLASS-XII COMPUTER SCIENCE (PYTHON)

UNIT	UNIT NAME	MARKS
1	Computational thinking & Progg.-2 (Python)	40
2	Computer Networks	10
3	Database Management	20

Unit 1: Programming and Computational Thinking

→ Revision of **Class XI (Python Programming)**

- Conditional statement (if, if-else, if-elif, nested if)
- Looping Statement (for, while), Jump Statement (break, continue), **Nested Loops**
- Strings (Traversing, String Operators, String Slices, String Functions)
- Lists (Lists vs. Strings, List manipulation, List Functions)
- Tuples (Tuples vs. Lists, Tuple Operations, Tuple Functions and Methods)
- Dictionaries (Dictionary Operations, Dictionary Functions and Methods)
- Introduction to **Python modules**: Importing Module (Math, Random, Statics Module)

• **Functions**

- Defining Functions, Built-In functions, User defined functions
- Passing Parameters (Default Parameters & Positional Parameters)
- Returning values from Functions, Flow of execution
- Scope of variables (Local & Global Scope)
- **Introduction to Python Libraries**

• **Introduction to File (File handling)**

- Types of files (Text file, Binary file, CSV file), Absolute and Relative Path
- Opening and Closing of Files, File Opening modes (r, r+, w, w+, a, a+)
- **Text file**: Reading and writing from/onto files (write(), writelines(), read(), readline(), etc functions), Seek and Tell methods, Manipulation of data in a text file
- Standard Input, Output, Error Streams
- **Binary file**: Basic operations on a binary file: file open modes (rb, rb+, wb, wb+, ab, ab+), 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 csv.writer() and read from a csv file using csv.reader()
- **Data Structure**: Stack, operations on stack (push & pop), implementation of stack using list.

Unit 2: Computer Networks (CN)

- **Evolution of networking:** intro to computer networks, evolution of networking (ARPANET, etc)
- **Data communication terminologies:** Components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of comm. 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, etc.)
- Network topologies ((Bus, Star, Tree) and Network types (PAN, LAN, MAN, WAN)
- **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 3: Database Management (MySQL)

- **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 (DDL) and Data Manipulation Language (DML)
 - **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 fetchone(), fetchall(), rowcount, creating database connectivity applications

Key Features:

➔ Theory + Practical Sessions ➔ Assignments ➔ Backup Classes

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