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FOR PUNJAB CLASS 12 PREPARATION

PSEB 12th Class Syllabus 2027 Computer Application

EXAM	YEAR	TYPE	SUBJECT
Punjab Class 12	2027	Syllabus	Computer Science

Syllabus - Computer Application

Session 2026-27

Class 12th Class

Unit-I

I: Networking and Internet:

- **Introduction to Computer Networks:** Network Concept, Types of Networks (PAN, LAN, MAN, WAN), Networking Topologies (Bus, Star, Ring, Tree, Mesh)
- **Transmission Media:** Guided (Wired) Communication Media (Twisted pair cable, Co-axial cable, Fibre-optic cable), Un-Guided (Wireless) Media (Radio waves, Microwaves, Infrared Waves)
- **Network Devices:** Modem, Network Interface Card (NIC), RJ45, Repeater, Hub, Switch, Router, Gateway
- **Network Protocol:** HTTP, FTP, SMTP, TCP/IP, POP3, HTTPS, TELNET, ARP, RDP, IMAP
- **Internet Concepts:** WWW, Domain Names, URL, Website, Web Browser, Web Servers, Web Hosting, Concept of a Client and Server, New Technologies such as Cloud and IoT

II: Cyber Laws and Ethics:

- **Cyber-Crime:** Definition, Hacking, Spying (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:** Adware, Malware, Viruses, Trojans, Phishing and Identity Verification
- **CIA Triad**
- **Cyber Ethics**

- **E-Waste Management:** Proper disposal of used Electronic Gadgets
- **IT Act:** Indian Information Technology Act (IT Act) 2000

Unit-II

III: Database Management System

- **Database concepts**: Introduction to Data, Information, Database and its needs, Traditional File System v/s Database System
- **Data Models**: Introduction, Hierarchical Data Model, Network Data Model, Relational Data Model
- **Introduction to DBMS:** DBMS, Components of DBMS
- **Relational Data Model:** Relation, Attribute, Tuple, Domain, Degree, Cardinality, Keys (Candidate Key, Primary Key, Alternate Key, Foreign Key)
- **Normalization**: Anomalies in Unnormalized Database, Dependencies, Normal Forms, 1NF, 2NF, 3NF
- **MySQL:** Introduction to MySQL, Data Types, Data Definition: CREATE TABLE, DROP TABLE, ALTER TABLE; Data Query: SELECT, FROM, WHERE; Data Manipulation: INSERT, UPDATE, DELETE; Using Inbuilt Functions such as: Math functions, Text functions etc; Querying and manipulating data using Group by, Having, Order by.

IV: Software Engineering:

- **Software and Software Engineering**: Approach
- **Software Development Life Cycle:** SDLC and Its Phases
- **Software Development Process Models:** Waterfall, Prototyping

Unit-III

V: Introduction to Python:

- **Introduction to Python:** Python and its features
- **Setting up Python:** System Requirements for Python, Downloading and Installing Python, Intro to Python IDE, Executing a Simple "hello world" Program
- **Basic concepts for Python Programming:** Python Character Set, Python Tokens (Keyword, Identifier, Literal, Operator, Punctuator), Variables, Concept of L-Value and R-Value, Use of Comments

VI: Data Types, Operators and Expression in Python:

- **Data Types:** Number (Integer, Floating Point, Complex), Boolean, Sequence (String, List, Tuple), None, Mapping (Dictionary), Mutable and Immutable Data Types
- **Operators:** 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

VII: Control Statements in Python:

- **Introduction**: Use of Indentation, Sequential Flow, Conditional and Iterative Flow control
- **Conditional Statements:** if, if-else, if-elif-else, Flowcharts, Simple Programs: e.g.: absolute value, largest of 2 and 3 numbers, finding divisibility of numbers etc

- **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

Unit-IV

VIII: Strings in Python:

- **Introduction:** Indexing, String Operations (Concatenation, Repetition, Membership & Slicing)
- **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()

IX: Lists, Tuples and Dictionaries in Python:

- **Lists:** 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
- **Tuples**: Introduction, indexing, tuple operations (concatenation, repetition, membership & slicing), built-in functions: len(), tuple(), count(), index(), sorted(), min(), max(), sum(); tuple assignment, nested tuple
- **Dictionary**: 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()

Practical Activities

1. Create the following table in MySQL with table name: stu_table and insert the records as shown below:

Roll No	Student Name	Class	Marks	Result
101	Dazy	12th	56	Pass
102	Amit	12th	15	Fail
103	Rohit	12th	72	Pass
104	Param	12th	96	Pass
105	Divya	12th	76	Pass

2. Write a query In MySQL which shows records (using above table: stu_table) as per the following criteria:
    a. Marks between 50 to 80
    b. Where Student Name ends with t
    c. Where Result is Fail
3. Perform the following on the table: stu_table
    a. Update the marks to 60 for the student with Roll No 101
    b. Delete the record with Student Name "Rohit"
    c. Insert a new entry of student with Roll No 106
    d. Show the table in sorted form (descending order) as per the marks obtained by the student
4. Write a program in Python to calculate the Area of Circle
5. Write a program in Python to Swap two numbers
6. Write a program in Python to find the largest of two numbers
7. Write a program in Python to check if the given number is Zero, Negative or Positive
8. Write a program in Python to Check whether a given character is a vowel or consonant
9. Write a program in Python to find the factorial of a given number.
10. Write a program in Python to Calculate the sum of digits of a given number.
11. Write a program in Python to reverse a number.
12. Write a program in Python to linearly search an element from a List
13. Write a program in Python to find the sum numbers stored in a List.

14. Write programs to generate the following pattern:

*	1234	E
* *	123	ED
* * *	12	EDC
* * * *	1	EDCB

15. Write a program in Python to check if given string is Palindrome or not.
16. Write a Python program which shows the use of various String Operations (Concatenation, Repetition, Membership & Slicing)
17. Write a Python program to sort the list of fruits alphabetically.
18. Write a Python program to show the different methods of slicing on Strings
19. Write a Python program to add the individual elements of two Lists.
20. Write a Python program to create a list of lists (Nested or 2D Lists) and show the Nested List in Matrix form
21. Write a Python program to count the occurrences of an element in a Tuple
22. Write a Python program which shows how to work with Dictionaries

Charts/Models

- Prepare a chart/model which shows the different types of Network Topologies
- Prepare a chart/model which shows the different types of Transmission Media
- Prepare a chart/Model which depicts the Concept of a Client and Server.
- Prepare a chart/Model for the CIA Triad.
- Prepare a chart/model for Waterfall-Software Development Process Model
- Prepare a chart/model that shows the concept of Data and Information
- Prepare a chart/model that shows the MySQL Query Processing Model
- Prepare a chart/model that shows the basic terminologies of Relational Model