5. Suggested Practical List

5.1 Programming in Python

- 1. To find average and grade for given marks.
- 2. To find sale price of an item with given cost and discount (%).
- 3. To calculate perimeter/circumference and area of shapes such as triangle, rectangle, square and circle.
- 4. To calculate Simple and Compound interest.
- 5. To calculate profit-loss for given Cost and Sell Price.
- 6. To calculate EMI for Amount, Period and Interest.
- 7. To calculate tax GST / Income Tax.
- 8. To find the largest and smallest numbers in a list.
- 9. To find the third largest/smallest number in a list.
- 10. To find the sum of squares of the first 100 natural numbers.
- 11. To print the first 'n' multiples of given number.
- 12. To count the number of vowels in user entered string.
- 13. To print the words starting with a alphabet in a user entered string.
- 14. To print number of occurrences of a given alphabet in each string.
- 15. Create a dictionary to store names of states and their capitals.
- 16. Create a dictionary of students to store names and marks obtained in 5 subjects.
- 17. To print the highest and lowest values in the dictionary.

5.2 Data Management: SQL Commands

- 1. To create a database
- 2. To create student table with the student id, class, section, gender, name, dob, and marks as attributes where the student id is the primary key.
- 3. To insert the details of at least 10 students in the above table.
- 4. To display the entire content of table.
- 5. To display Rno, Name and Marks of those students who are scoring marks more than 50.
- 6. To display Rno, Name, DOB of those students who are born between '2005- 01-01' and '2005-12-31'.

Suggested material

NCERT Informatics Practices - Text book for class - XI (ISBN- 978-93-5292-148-5)

Informatics Practices (2024-25) CLASS XII Code No. 065

1. Prerequisite: Informatics Practices – Class XI

2. Learning Outcomes

At the end of this course, students will be able to:

- Create Series, Data frames and apply various operations.
- Visualize data using relevant graphs.
- Design SQL queries using aggregate functions.
- Import/Export data between SQL database and Pandas.
- Learn terminology related to networking and internet.
- Identify internet security issues and configure browser settings.
- Understand the impact of technology on society including gender and disability issues.

3. Distribution of Marks and Periods

Unit No	Unit Name	Marks	Periods Theory	Periods Practical	Total Period
1	Data Handling using Pandas and Data Visualization	25	25	25	50
2	Database Query using SQL	25	20	17	37
3	Introduction to Computer Networks	10	12	-	12
4	Societal Impacts	10	14	-	14
	Project	-	-	7	7
	Practical	30	-	-	-
	Total	100	71	49	120

4. Unit Wise syllabus

Unit 1: Data Handling using Pandas -

Introduction to Python libraries- Pandas, Matplotlib. Data structures in Pandas - Series and Data Frames. Series: Creation of Series from – ndarray, dictionary, scalar value; mathematical operations; Head and Tail functions; Selection, Indexing and Slicing.

Data Frames: creation - from dictionary of Series, list of dictionaries, Text/CSV files; display; iteration; Operations on rows and columns: add, select, delete, rename; Head and Tail functions; Indexing using Labels, Boolean Indexing;

Importing/Exporting Data between CSV files and Data Frames.

Data Visualization

Purpose of plotting; drawing and saving following types of plots using Matplotlib – line plot, bar graph, histogram

Customizing plots: adding label, title, and legend in plots.

Unit 2: Database Query using SQL

Revision of database concepts and SQL commands covered in class XI

Math functions: POWER (), ROUND (), MOD ().

Text functions: UCASE ()/ UPPER (), LCASE ()/ LOWER (), MID ()/ SUBSTRING () /SUBSTR (), LENGTH (), LEFT (), RIGHT (), INSTR (), LTRIM (), RTRIM (), TRIM ().

Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME ().

Aggregate Functions: MAX (), MIN (), AVG (), SUM (), COUNT (); using COUNT (*).

Querying and manipulating data using Group by, Having, Order by.

Working with two tables using equi-join

Unit 3: Introduction to Computer Networks

Introduction to networks, Types of network: PAN, LAN, MAN, WAN.

Network Devices: modem, hub, switch, repeater, router, gateway

Network Topologies: Star, Bus, Tree, Mesh.

Introduction to Internet, URL, W W W, and its applications- Web, email, Chat, VoIP.

Website: Introduction, difference between a website and webpage, static vs dynamic web page, web server and hosting of a website.

Web Browsers: Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies.

Unit 4: Societal Impacts

Digital footprint, net and communication etiquettes, data protection, intellectual property rights (IPR), plagiarism, licensing and copyright, free and open source software (FOSS), cybercrime and cyber laws, hacking, phishing, cyber bullying, overview of Indian IT Act.

E-waste: hazards and management.

Awareness about health concerns related to the usage of technology.