

SAINIK SCHOOL CHANDRAPUR
CLASS XII
HOLIDAY HOMEWORK
AY 2024-25
SUBJECT – COMPUTER SCIENCE

IMPORTANT INSTRUCTIONS:

1. Cadets will have to write answers for the following questions in a copy during holidays only, no extra time will be provided and those who fails to submit the same will be considered as negligence of cadet and will be marked “**not submitted**” on very day of starting of academic activities.
2. Cadets will submit the Holiday Homework by themselves, without getting asked, if anyone or everyone fails to comply, will be treated as mentioned in point 1.
3. **Along with these questions cadets will have to complete their Practical Journal/Record Book on either ready-made book available in market or on single side ruled pages with hard cover.**

PDF for content is provided on link
https://sainikschoolchandrapur.com/RECORD_BOOK.zip

4. Instructions related to the same are marked on pdf, cadets will have to write Record book and will have to stick screenshots as given in attachment, **on ruled side no screenshot will be pasted, everything will be handwritten.** For any queries cadets can contact on 8275834466, noncompliance or non-completion of record may lead to non-allowance to computer lab for Practical which may lead to failure in final practical exam.

1. DATABASE CONCEPTS:

- a. Discuss the basics of database management systems (DBMS) and their importance in organizing and storing data efficiently.
- b. Case Study: Analyse a scenario where a small business needs to manage customer information and inventory using a database. Discuss the benefits and challenges of implementing a database system in this context.

2. Relational Data Model:

- a. Define the terms relation, attribute, and tuple in the context of a relational database.
- b. Case Study: Consider a university database where student records are stored in a table. Describe the attributes and tuples in this scenario and identify potential keys.

3. STRUCTURED QUERY LANGUAGE (SQL) INTRODUCTION:

- a. Explain the basic syntax of the SQL SELECT statement and its usage for retrieving data from a table.
- b. Case Study: Imagine a bookstore database where information about books, authors, and sales transactions is stored. Write SQL queries to retrieve the top-selling books and the authors with the highest sales.

4. DATA TYPES AND CONSTRAINTS IN SQL:

- a. Discuss common data types in SQL, such as INT, VARCHAR, and DATE, and their significance in defining table structure.
- b. Case Study: Consider a customer database for an e-commerce platform. Discuss the importance of using constraints such as NOT NULL and UNIQUE to ensure data integrity and prevent duplicate entries.

5. SQL DATABASE OPERATIONS:

- a. Explain the purpose of the SQL INSERT, UPDATE, and DELETE statements for manipulating data in a table.
- b. Case Study: Analyse a scenario where a manufacturing company needs to track inventory levels and update product information in a database. Describe how SQL queries can be used to manage inventory data effectively.

6. SQL QUERYING:

- a. Discuss the usage of the WHERE clause in SQL queries for filtering data based on specified conditions.
- b. Case Study: Consider a hospital database where patient records are stored. Write SQL queries to retrieve information about patients admitted between specific dates and with a certain medical condition.

7. SQL AGGREGATE FUNCTIONS AND GROUPING:

- a. Explain the concept of aggregate functions in SQL, such as COUNT, SUM, and AVG, and their role in performing calculations on grouped data.
- b. Case Study: Imagine a sales database for a retail chain. Write SQL queries to calculate total sales revenue for each product category and identify the best-selling category.

8. SQL JOINS:

- a. Discuss the different types of joins in SQL, including INNER JOIN, LEFT JOIN, and RIGHT JOIN, and their usage for combining data from multiple tables.
- b. Case Study: Consider a database for a school where student information and course enrolment data are stored in separate tables. Write SQL queries to retrieve a list of students enrolled in specific courses.

9. PYTHON INTERFACE WITH SQL DATABASE:

- a. Describe the process of connecting Python to an SQL database and executing SQL queries using libraries such as sqlite3.
- b. Case Study: Explore a scenario where a data analysis team needs to extract data from an SQL database and perform statistical analysis using Python. Discuss the steps involved in connecting to the database and retrieving the required data.

10. ADVANCED SQL QUERIES AND TECHNIQUES:

- a. Discuss the concept of subqueries in SQL and their usage for nesting queries within other queries to perform complex data retrieval tasks.
- b. Case Study: Consider a social media platform where user activity data is stored in a database. Write SQL queries to identify users with the highest engagement levels based on likes, comments, and shares.