



Roll No.....

End Semester Examination, December 2024
Pan University – 1st Semester
Data Analytics using SQL (UDT101)

Time: 2.5 hrs.

Max Marks: 50

Note: **All Questions are compulsory.** Marks are indicated against each question.

PART-A

Q.1 **Attempt any five questions:**

- (a) What is a primary key in SQL? Why is it important in relational databases? [CO1] [L2].
(b) Write an SQL query to retrieve all records from the Customers table where the Country is 'India'. [CO1] [L2].

Table: Customers

CustomerID	CustomerName	ContactName	Country
1	John Doe	John	India
2	Jane Smith	Jane	USA
3	Ali Khan	Ali	India
4	Emma Watson	Emma	UK

- (c) Write a simple query using a subquery to find employees who earn more than the average salary. [CO1] [L1,2].
(d) What is the difference between the WHERE and HAVING clauses in SQL? Provide an example for each. [CO1] [L 1,2].
(e) Explain the use of the GROUP BY clause in SQL with an example. [CO1] [L1, 2].
(f) Write an SQL query to retrieve all records from a table Customers. [CO1] [L2]
(g) Write an SQL query to find all orders and their associated customer names USING Inner Join Operation. [CO1] [L 2]

Orders Table:

OrderID	CustomerID	OrderAmount
1	101	500
2	102	300
3	101	700

Customers Table:

CustomerID	CustomerName
101	John Doe
102	Jane Smith

(2 x 5 = 10 Marks)

PART-B

- Q.2 (a) Write a SQL query to clean a dataset by replacing missing values in the EmployeeSalary column with the average salary of all employees in the Employee table. [CO2] [L-3] 10

Table: Employee

EmployeeID	EmployeeName	EmployeeSalary
1	Alice	50000
2	Bob	NULL
3	Charlie	45000
4	David	70000

OR

(b) Discuss the following operations:

- I. Describe how you would handle missing or NULL values in SQL. Include examples of how to use the **IS NULL**, **IS NOT NULL**, **COALESCE**, and **IFNULL** functions to replace or filter NULL values in a dataset.

- II. Describe how to perform basic data transformations in SQL, such as changing data types, concatenating columns, and applying mathematical functions to clean or modify the data.

[CO2] [L-3] 10

Q.3 (a) You have a Sales table with columns SaleID, ProductID, Amount, and SaleDate. Write a query to calculate the total sales per product. Identify any patterns based on your results.

[CO3] [L-3] 10

OR

(b) Given a table Employees with columns EmployeeID, Salary, and DepartmentID, write a query to identify the average salary per department. Summarize the key statistics for insights.

[CO3] [L-2, 3] 10

Q.4 Write an SQL query to retrieve all teacher details (TEACHER_CODE, TEACHER_NAME, DOJ) for teachers whose names contain the letter "I". Once you have the query results, evaluate the data by creating a pie chart or bar graph showing the number of teachers with and without the letter "I" in their name. Provide an interpretation of the chart and highlight any noticeable trends.

[CO4] [L-5] 10

OR

You are tasked with evaluating the **employee performance** data for an organization. Write SQL queries to perform the following:

- Calculate the **total number of employees** in each **department**.
- Find the **average salary** for employees in each department.
- Identify the **department with the highest average salary**.
- Write an SQL query to list employees whose salary is greater than the average salary of their respective departments.

[CO4] [L-5] 10

Q.5 Write a SQL query to calculate the running total of sales using the SUM() window function for a Sales table sorted by SaleDate.

[CO2] [L-2,3] 10

Table: Sales

SaleID	ProductID	Amount	SaleDate
1	101	100	2024-11-01
2	102	200	2024-11-02
3	101	150	2024-11-03

OR

Observe the given Table TEACHER and give the output of question (i) and (ii)

TEACHER_CODE	TEACHER_NAME	DOJ
T001	ANAND	2001-01-30
T002	AMIT	2007-09-05
T003	ANKIT	2007-09-20
T004	BALBIR	2010-02-15
T005	JASBIR	2011-01-20
T006	KULBIR	2008-07-11

- SELECT TEACHER_NAME,DOJ FROM TEACHER WHERE TEACHER_NAME LIKE „%I%“
- SELECT * FROM TEACHER WHERE DOJ LIKE „%-09-%“;

[CO- 2] [L-3,4] 10