

INDIRA UNIVERSITY, PUNE

SCHOOL OF INFORMATION TECHNOLOGY-BSC (CS)

Term End Examination (2025 Pattern) December – 2025 - Semester – I

Subject Name: - Database Management System
Subject Code: 25BSC102T

Max. Marks: 25
Time: 1:30 Hrs.

Instructions

- All Questions are Compulsory.
- Draw neat labelled diagram wherever necessary.

CO #	Cognitive Ability	Course Outcome
CO2	Understand	Explain principles of data modeling, constraints, and relational structures to represent real-world scenarios effectively.
CO3	Apply	Use database languages and tools to define, manipulate, and retrieve data in varied application contexts.
CO6	Create	Design and implement database solutions that align with organizational requirements and industry best practices.

Q1.	<p>Attempt any 5 out of 7. (1 mark each)</p> <p>a) Define is DBMS. b) Describe the rules of 2NF. c) Summarize primary functions of DBMS. d) Define Specialization ER model. e) Who uses the physical level of data abstraction? f) Define the term Delete Anomaly g) List any two types of attributes.</p>	(5 Marks)	CO2												
Q2.	<p>Attempt any 2 out of 4. (5 marks each)</p> <p>a) Describe the concept of Set Operations in SQL and Write SQL queries to apply the following set operations on two tables — DeptA_Employees and DeptB_Employees: 1) to combine employee names from both department tables (without duplicates). 2) to find employees common to both department tables. 3) to find employees who work only in Department A</p> <p>b) Differentiate between File System and Database Management System (DBMS) in detail.</p> <p>c) The following table is not in First Normal Form (1NF). Apply the rules of 1NF to normalize it:</p> <table border="1" data-bbox="435 1749 1094 1913"> <thead> <tr> <th>IssueID</th> <th>MemberName</th> <th>BooksIssued</th> </tr> </thead> <tbody> <tr> <td>201</td> <td>Aarav</td> <td>Maths, Physics</td> </tr> <tr> <td>202</td> <td>Priya</td> <td>Chemistry</td> </tr> <tr> <td>203</td> <td>Rohan</td> <td>Physics, Chemistry</td> </tr> </tbody> </table>	IssueID	MemberName	BooksIssued	201	Aarav	Maths, Physics	202	Priya	Chemistry	203	Rohan	Physics, Chemistry	(10 Marks)	CO3
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	d) Define Constraints and Construct examples to show how UNIQUE, DEFAULT, and NOT NULL constraints are used in DBMS.	
Q.3.	<p>Attempt all questions. (5 marks each) (10 Marks)</p> <p>a) There is a one-to-many relationship between Author and Book (one author can write many books).</p> <p>Construct the SQL queries for the following:</p> <ol style="list-style-type: none"> 1) Create the following tables with appropriate data types: Authors(AuthorID, AuthorName, Country) and Books(BookID, Title, AuthorID, Price). 2) Insert any two records in each table. 3) Write SQL queries: <ul style="list-style-type: none"> • List all books in descending order of their price. • list books whose price is greater than 500. • Find all authors whose name starts with the letter 'A' <p>b) An organization manages multiple Events and multiple Participants. A participant can register for multiple events, and each event can have multiple participants. Each registration is recorded as a Registration, which tracks the participation status. Each event is organized by one or more Organizers, and each organizer can organize multiple events.</p> <ol style="list-style-type: none"> i) Identify the entities, attributes and relationships. ii) Construct a detailed E-R diagram showing all entities and relationships.(Assume suitable attributes) <p style="text-align: center;">OR</p>	CO6
Q.3	<p>Attempt all questions. (10 marks)</p> <p>A) Consider the relation schema R(A, B, C, D, E) with the set of functional dependencies:</p> <p>FD's = { A → B, B → C, A → D, CD → E }</p> <ol style="list-style-type: none"> 1) Apply Armstrong's axioms to compute the closure of the functional dependency set (F⁺). 2) Determine the closure of attribute {A} using the given functional dependencies. (5 Marks) <p>B) Write SQL queries using the following keywords. Assume a table Students(StudentID, Name, Age, Marks, City).</p> <ol style="list-style-type: none"> 1) BETWEEN – Create a query to display the Names of students whose Marks are between 60 and 80. 2) DISTINCT – Create a query to display unique city names from the Students table. (3 Marks) <p>C) Create your own example to clearly show the difference between data and information. (2 Marks)</p>	CO6
