



PRESIDENCY UNIVERSITY

BENGALURU

Roll No.														
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End - Term Examinations – May / June 2026

Date: 26 – 05- 2026

Time: 09:30am – 12:30pm

School: SOCSE	Program: CSE, CDV, CBC, CIT, ISE, IST	
Course Code : CSE2260	Course Name: Database Management Systems	
Semester: IV	Max Marks: 100	Weightage: 50%

CO - Levels	C01	C02	C03	C04	C05
Marks	12	14	24	26	24

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

1.	What is data independence? Differentiate between logical and physical data independence	2 Marks	L2	C01																														
2.	Define Entity Relationship (ER) model.	2 Marks	L2	C02																														
3.	Given relation R(A,B,C) with tuples {(1,2,3), (1,3,4)}, find: a) $\sigma(A=1)(R)$ b) $\pi(B,C)(R)$	2 Marks	L3	C02																														
4.	Convert SQL query to relational algebra: SELECT * FROM R WHERE A=10	2 Marks	L3	C03																														
5.	Define Query optimization.	2 Marks	L3	C03																														
6.	Check if relation is in 2NF: R(A,B,C), $A \rightarrow B$, $AB \rightarrow C$	2 Marks	L3	C04																														
7.	Consider the following relation: R(BOOK_ID, TITLE, AUTHOR, PRICE, PUBLISHER) <table border="1"> <thead> <tr> <th>BOOK_ID</th><th>TITLE</th><th>AUTHOR</th><th>PRICE</th><th>PUBLISHER</th></tr> </thead> <tbody> <tr> <td>1</td><td>DBMS</td><td>X</td><td>500</td><td>P1</td></tr> <tr> <td>2</td><td>AI</td><td>Y</td><td>600</td><td>P2</td></tr> <tr> <td>3</td><td>DBMS</td><td>X</td><td>500</td><td>P1</td></tr> <tr> <td>4</td><td>ML</td><td>Z</td><td>700</td><td>P3</td></tr> <tr> <td>5</td><td>AI</td><td>Y</td><td>600</td><td>P2</td></tr> </tbody> </table>	BOOK_ID	TITLE	AUTHOR	PRICE	PUBLISHER	1	DBMS	X	500	P1	2	AI	Y	600	P2	3	DBMS	X	500	P1	4	ML	Z	700	P3	5	AI	Y	600	P2	2 Marks	L3	C04
BOOK_ID	TITLE	AUTHOR	PRICE	PUBLISHER																														
1	DBMS	X	500	P1																														
2	AI	Y	600	P2																														
3	DBMS	X	500	P1																														
4	ML	Z	700	P3																														
5	AI	Y	600	P2																														

	BOOK_ID → TITLE TITLE → BOOK_ID			
8.	Define recoverability in transactions.	2 Marks	L2	C04
9.	Give any 2 examples of spatial queries.	2 Marks	L2	C05
10.	Define valid time and transaction time?	2 Marks	L2	C05

Part B

Answer the Questions.

Total Marks 80M

11.	a.	Describe 3 schema architecture in DBMS.	10 Marks	L2	C01																								
	b.	Construct an ER diagram for employee database with following constraints. i. An employee works for a department. ii. Every department is headed by a manager. iii. An employee works on one or more projects. iv. An employee has dependents. v. A department controls the project	10 Marks	L3	C02																								
Or																													
12.	a.	Given 2 tables EMPLOYEE_A(EMP_ID, NAME) <table><tr><th>EMP_ID</th><th>NAME</th></tr><tr><td>201</td><td>Amit</td></tr><tr><td>202</td><td>Sneha</td></tr><tr><td>203</td><td>Raj</td></tr><tr><td>204</td><td>Pooja</td></tr><tr><td>205</td><td>Vikram</td></tr></table> EMPLOYEE_B(EMP_ID, NAME) <table><tr><th>EMP_ID</th><th>NAME</th></tr><tr><td>203</td><td>Raj</td></tr><tr><td>204</td><td>Pooja</td></tr><tr><td>206</td><td>Neeraj</td></tr><tr><td>207</td><td>Kavya</td></tr><tr><td>208</td><td>Rohan</td></tr></table> Write output for the following set operations. i) EMPLOYEE_A ∪ EMPLOYEE_B ii) EMPLOYEE_A ∩ EMPLOYEE_B iii) EMPLOYEE_A ⋈ EMPLOYEE_B iv) EMPLOYEE_A – EMPLOYEE_B v) EMPLOYEE_A × EMPLOYEE_B	EMP_ID	NAME	201	Amit	202	Sneha	203	Raj	204	Pooja	205	Vikram	EMP_ID	NAME	203	Raj	204	Pooja	206	Neeraj	207	Kavya	208	Rohan	10 Marks	L3	C02
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	b.	Explain Database languages in DBMS.	10 Marks	L2	CO1
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13.	a.	Describe Aggregate functions with an example.	10 Marks	L2	CO3
	b.	Construct the SQL Queries for the following requirements with the help of following schema. EMPLOYEE (EID, ENAME, ADDRESS, SALARY, DEPTID) DEPARTMENT (ID, DNAME, HOD) PROJECT (PID, PNAME, DEPTID, LOCATION) DEPENDENT (NAME, EID, AGE) WORK_ON (PID, EID, HOURS) i) Retrieve the name and address of employees who works for department no 5. ii) Retrieve the id of employee who has no dependents. iii) Retrieve name and department id of employees who put up from 'Bengaluru' and earning salary greater than 60000/-. iv) Find all the names of employees who work on all projects controlled by department 3. v) Find the employee names who are working under HOD "Dr. ABC".	10 Marks	L3	CO3

Or

14.	a.	Explain advantages and disadvantages of Views in DBMS.	10 Marks	L2	CO3
	b.	Consider LOAN_ACCOUNT (LOAN_ID, CUST_ID, LOAN_AMOUNT, PAID_AMOUNT, STATUS) PAYMENT_LOG (LOG_ID, LOAN_ID, OLD_PAID, NEW_PAID, PAYMENT_DATE) Create triggers for: i) Prevent payment if PAID_AMOUNT becomes greater than LOAN_AMOUNT. ii) Whenever a payment is made (PAID_AMOUNT updated), record the details in PAYMENT_LOG.	10 Marks	L3	CO3

15.	a.	Describe different types of functional dependencies with an example.	10 Marks	L2	CO4
	b.	Compute the closure of the following set F of functional dependencies for relation schema R = {A, B, C, D, E}.	10 Marks	L3	CO4

		A -> BC CD -> E B -> D E -> A i) List the candidate keys for R. ii) Find super keys.			
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Or

16.	a.	Explain in detail transaction states with a neat diagram.	10 Marks	L2	C04
	b.	Illustrate problems occur during concurrent transactions.	10 Marks	L3	C04

17.	a.	Explain NoSQL databases and types with examples.	10 Marks	L2	C05
	b.	Explain the architecture of Data Warehousing.	10 Marks	L2	C05

Or

18.	a.	Explain Object-Oriented Database Management System (OODBMS).	10 Marks	L2	C05
	b.	Describe the structure of a Deductive Database System with an example.	10 Marks	L2	C05