

Hall Ticket Number:

Code No. : 16136 B

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. VI-Semester Main & Backlog Examinations, June-2022

Introduction to Databases (OE-IV)

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	List the applications of Database Management Systems.	2	1	1	1,2
2.	Convert the given E-R Model into relational Model.	2	3	1	1,2,3
3.	Write an SQL Query to retrieve current date and time	2	3	2	1,2
4.	Construct SQL queries that are equivalent to each of the following i) $\Pi_A(R)$ ii) $R \times S$ Where relational schemas are $R = (A, B, C)$ $S = (D, E, F)$	2	3	2	1,2,3
5.	Define the terms Super key, Primary key, and Candidate Key.	2	1	3	1,2
6.	A table has fields F1, F2, F3, F4, and F5, with the following functional dependencies: F1 → F3 F2 → F4 (F1, F2) → F5 in terms of normalization, explain which normal form the table satisfies	2	3	3	1,2,3
7.	Differentiate Static and Dynamic hashing?	2	2	4	1,2
8.	Construct B + tree for the following set of key values 5 11 22 32 43 44 45 76 47 58 where number of pointers are four.	2	3	4	1,2,3
9.	What are ACID Properties in a Transaction?	2	1	5	1,2
10.	Define serializability?	2	1	5	1,2
Part-B (5 × 8 = 40 Marks)					
11. a)	Explain the architecture of Database Management System with neat sketch	4	2	1	1,2
b)	Draw an ER diagram for a BANK database schema with at least five entity types. Also specify primary key and structural constraints.	4	3	1	1,2,3

Contd... 2

12. a)	What is Relational algebra? Explain the fundamental Relational algebra operations in detail	4	2	2	1,2
b)	Consider the given schema and write the following Relational algebra queries Customer (<u>Customer_name</u> , Customer_city) Account (<u>account_number</u> , Customer_name) Borrower (Customer_name, Loan_number) Depositor (Customer_name, account_number) i) To find all customers of the bank who have an account but not a loan ii) To find all customers of the bank who have both an account and a loan	4	3	2	1,2,3
13. a)	What is Normalization? Explain 1NF, 2NF and 3NF with example.	4	2	3	1,2
b)	Compute the closure of the following set F of functional dependences for relation schema R (A, B, C, D, E) A->BC, CD->E, B->D, E->A. List the candidate keys for R.	4	3	3	1,2,3
14. a)	Differentiate Sparse Indexing and Dense Indexing with an example	4	2	4	1,2
b)	How B+ tree is different from B tree? Write the advantages of B+ tree.	4	3	4	1,2
15. a)	What is Recoverability in Transactions? Which transactions are recoverable transactions?	4	2	5	1,2
b)	How to implement Atomicity and Durability properties in Transactions?	4	3	5	1,2
16. a)	Write the functionalities of a Database Administrator in Database Management Systems	4	2	1	1,2
b)	Employee (<u>Employee name</u> , Street, City) Works (Employee name, Company_name, Salary) Company (<u>Company name</u> , City) Manages (Employee_name, Manager_name) Write the following queries in SQL: i) Find the names and cities of residence of all employees who work for "First Bank Corporation". ii) Find the names, street address and cities of residence of all employees who work for "First Bank Corporation" and earn more than \$10,000.	4	3	2	1,2,3
17.	Answer any <i>two</i> of the following:				
a)	What is Boyce Codd Normal form (BCNF)? How it is related to other normal forms?	4	1	3	1,2
b)	What indexing and hashing is important in database management systems.	4	2	4	1,2,3
c)	Write the advantages of concurrent execution in transactions.	4	1	5	1,2

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level - 1	20%
ii)	Blooms Taxonomy Level - 2	38%
iii)	Blooms Taxonomy Level - 3 & 4	42%
