Hall Ticket Number:

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VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD
Accredited by NAAC with A++ Grade
B.E. IV-Semester Advanced Supplementary Examinations, Aug./Sep.-2023
Database Management Systems
(Common to CSE & AIML)

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.	Describe database.	2	1	1	1,2
2.	What is physical data independence?	2	1	1	1,2
3.	Describe the term strong entity set.	2	1	2	1,2
4.	What is referential integrity	2	1	2	1,2
5.	Let $F = \{A \rightarrow B, C \rightarrow D, D \rightarrow E\}$ be a set of functional dependencies. Find the closure of the set $\{A,C\}$.	2	1	3	1,2
6.	What is meant by NOT NULL constraint?	2	1	3	1,2
7.	Is it possible to have two clustered indexes on the same relation?	2	1	4	1,2
8.	Explain durability property of a transaction.	2	1	4	1,2
9.	Given an example of wound-die scheme.	2	1	5	1,2
10.	What is ARIES?	2	2	5	1,2

Part-B (5×8 = 40 Marks)

11. a)	Draw the architecture of DBMS. Explain about each component.	4	2	1	1,2
b)	Explain about participation constraints in ER diagrams.	4	3	1	1,2
12. a)	Consider the following relational schema Employee (empno,name,office,age) Books(isbn,title,authors,publisher) Loan(empno, isbn,date) Write the following queries in relational algebra. a. Find the names of employees who have borrowed a book Published by 1 McGraw-Hill? b. Find the names of employees who have borrowed all books Published by McGraw-Hill? c. Find the names of employees who have borrowed more than five different books published by McGraw-Hill? d. For each publisher, find the names of employees who have borrowed?	4	3	2	1,2
b)	Discuss about correlated nested queries in SQL.	4	3	2	1,2
13. a)	Consider the following relational schemes for a library database: Book (Title, Author, Catalog_no, Publisher, Year, Price) Collection (Title, Author, Catalog_no) the following are functional dependencies: a. Title Author --> Catalog_no b. Catalog_no --> Title Author Publisher Year c. Publisher Title Year --> Price d. Assume {Author, Title} is the key for both schemes. Apply the appropriate normal form for Book and Collection.	4	4	3	1,2

b)	Define Cartesian product in relational algebra with example.	4	2	3	1,2	

14. a)	Consider the following transactions with data items P and Q initialized to zero:
	 T1: read(P); read(Q);
	 If P=0 then Q:=Q+1;
	 write(Q);
	 T2: read (Q);
	 read(P); I
	 f Q=0 then P:=P+1;
	 write (P);
	 Solve and find any non-serial interleaving of T1 and T2 for concurrent execution leads to a serializable schedule or non serializable schedule. Explain?
		4	4	4	1,2	

b)	Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. T1: r1(X);r1(Z);w1(X);w1(Z) T2: r2(Y);r2(Z);w2(Z) T3: r3(Y);r3(X);w3(Y) S1: r1(X);r3(Y);r3(X);r2(Y);r2(Z); w3(Y);w2(Z);r1(Z);w1(X);w1(Z) S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z); r2(Z); w3(Y); w1(X); w2(Z); w1(Z) Analyze which one of the schedules is conflict-serializable?	4	4	4	1,2	
15. a)	Briefly Describe Concurrency control execution? Illustrate with a suitable example	4	2	5	1,2	
b)	Explain about B trees indexing concepts with an example	4	2	5	1,2	
16. a)	Explain mapping cardinality constraints in ER model with examples.	4	2	1	1,2	
b)	Let E1 and E2 be two entities in an E/R diagram with simple single-valued attributes. R1 and R2 are two relationships between E1 and E2, where R1 is one- l to-many and R2 is many-to-many. R1 and R2 do not have any attributes of their own. Calculate the minimum number of tables required to represent this situation in the relational model?	4	2	2	1,2	
17.	Answer any *two* of the following:					
a)	Explain triggers with examples.	4	1	3	1,2	
b)	Why timestamp-based concurrency control allows schedules that are not recoverable. Explain with example.	4	1	4	1,2	
c)	Explain extendible hashing with an example.	4	2	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	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

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