QP Code : 93515
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University of Mumbai

Examinations Summer 2022

S.E. (Computer Engineering) (SEM-IV)

(Choice Base Credit Grading System) (R- 19) (C Scheme)

Subject: Database Management System

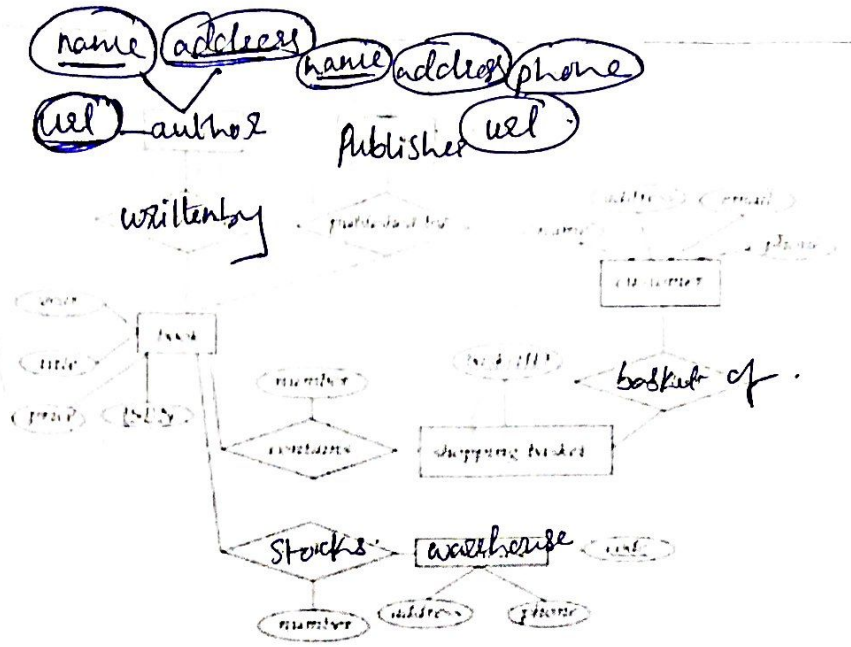
Time: 2 hour 30 minutes Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	The capacity to alter the database schema at one level without affecting any other levels is termed as
Option A:	Data Independence
Option B:	Data Mapping
Option C:	Data Isolation
Option D:	Data Transformation
2.	An attribute (say A) of entity set is calculated from other attribute value (say B). The attribute A is called
Option A:	Single valued
Option B:	Multi valued
Option C:	Composite
Option D:	Derived
3.	Consider the following relations: Parts (pid,pname,color) PartCost (pid,cost) What does the following relational algebra expression represent? $\Pi_{pid}((\sigma_{color='red'}(Parts)) \bowtie (\sigma_{cost \geq 1000}(PartCost)))$
Option A:	Find the pid of all parts whose color is red.
Option B:	Find the pid of all parts whose color is red or cost ≥ 1000.
Option C:	Find the pid of all parts whose color is red but not cost ≥ 1000.
Option D:	Find the pid of all parts whose color is red and cost ≥ 1000 .
4.	Let E1 and E2 be two entities in an E-R diagram with one multi-valued attribute in E1, R1 and R2 are two relationships between E1 and E2, where R1 is one-to-many and R2 is many-to-many, R1 and R2 do not have any attributes of their own, What is the minimum number of tables required to represent this situation in the relational model.
Option A:	2
Option B:	4
Option C:	3
Option D:	5
5.	Consider the instructor table: INSTRUCTOR (instr_id, name, dept name, salary). insert a new instructor `I-101', named `PMJ', with 50,000 salary for department `COMP'. Identify the appropriate SQL statement.
Option A:	INSERT INTO TABLE INSTRUCTOR VALUES (`I-101','PMJ','COMP', 10,00,000)
Option B:	INSERT INTO INSTRUCTOR (`I-101','PMJ','COMP', 50,000)
Option C:	INSERT INTO INSTRUCTOR VALUES (`I-101', `PMJ', 'COMP', 50,000)

Option D:	INSERT INTO TABLE INSTRUCTOR table instr_id, name, dept name, salary) VALUES ('I-101', 'PMJ', 'COMP', 50,000)
6.	Let R= (A, B, C, D, E, F) be a relation with the following dependencies. B->CE ,C->F, EC->D, A->B. Which of the following is a candidate key for R
Option A:	C
Option B:	E
Option C:	A
Option D:	B
7.	Identify the incorrect statement.
Option A:	3NF doesn't have transitive dependencies
Option B:	Composite attributes are not allowed in 1NF
Option C:	In 2NF, there should not be any Full functional dependencies
Option D:	In BCNF, trivial FD are allowed
8.	If T1,T2 are two transactions and I1 , I2 are two instructions of T1 and T2 respectively then I1 and I2 are conflicting instructions if
Option A:	They operate on the different data item
Option B:	They belong to different transactions
Option C:	At Least one of them is a write operation
Option D:	At Least one of them is a read operation
9.	Choose the correct option
Option A:	Every Conflict serializable schedule is also View serializable
Option B:	Every View serializable schedule is also conflict serializable
Option C:	Both a and b
Option D:	Every serial schedule has same conflict and view equivalent schedule
10.	When a transaction is aborted due to ant kind of failure,which instruction should be executed to keep database in consistent state
Option A:	Commit
Option B:	Rollback
Option C:	Savepoint
Option D:	Checkpoint

Q2	**Solve any Two Questions out of Three 10 marks each**
A	Short note on Data Independence. Define DBA Discuss roll and responsibilities of DBA.
B	Convert following E-R diagram to relational schema and equivalent schema diagram

QPCode : 93515

	
C	Explain following relational algebra operators with example a) Select: σ b) Project: ∏ c) Union: ∪ d) Rename e) Natural join

Q3	**Solve any Two Questions out of Three 10 marks each**
A	Book (book_id, title,author, cost) Store (store_no, city, state, inventory_val) Stock (store_no, book_id,quantity) Consider above relational schema and formulate SQL queries for the following: (i)Modify the cost of DBMS books by 10% (ii)Find the author of the books which are available in Mumbai store (iii)Find the title of the most expensive book (iv)Find the total quantity of books in each store (v) Add a new record in Book (Assume values as per requirement)
B	Why there is need of normalization? Explain 1NF,2NF,3NF and BCNF with examples.
C	Design an EER schema for a **BANK** database. Each bank can have multiple branches, and each branch can have multiple accounts and loans. Bank keeps the track of different types of Accounts (Saving_aacount, Checking_account), Loans (Car_loans,Home_loans,…) , each account's Transaction (deposit, withdrawal,check,..) and each loan's Payments; both of these include the amount, date and time. State any assumptions you make about the additional requirement clearly.

Q4	**Solve any Two Questions out of Three 10 marks each**
A	What is Deadlock and explain deadlock handling in DBMS with Example.

B	A schedule has transactions T1, T2, T3 has given below: T1 | T2 | T3 READ(X) | | | READ(Z) | READ(Z) | | | | READ(X) | | READ(Y) WRITE(X) | | | | WRITE(Y) | READ(Y) | | WRITE(Z) | | WRITE(Y) | a) What is conflict and view serializability? b) Draw a Precedence graph? c) Is schedule conflict serializable or not? d) Find equivalent serial schedule?
C	Describe ACID properties with examples and draw state transition diagram of transaction.