Database Management System

University of Mumbai
Examinations Summer 2022

Time: 2 hour 30 minutes   Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	A collection of data designed to be used by different people is called a/an
Option A:	Organization
Option B:	Database
Option C:	Relationship
Option D:	Schemas
2.	In database records are called as ....
Option A:	Domain
Option B:	Records
Option C:	Tuples
Option D:	Entity
3.	What is the mapping cardinality between individual DEPARTMENT table with its EMPLOYEE table?
Option A:	One to One
Option B:	One to Many
Option C:	Many to one
Option D:	Many to Many
4.	A table can be logically connected to another table by defining a
Option A:	Foreign Key
Option B:	Candidate key
Option C:	Unique key
Option D:	Primary key
5.	The given Query can also be replaced with_____ : SELECT name, course_id FROM teacher, teaches WHERE faculty_id= teaches_ID;
Option A:	Select name,course_id from teaches, teacher where faculty_id =course_id;
Option B:	Select name, course_id from teacher natural join teaches;
Option C:	Select name, course_id from teacher;
Option D:	Select course_id from teacher join teaches;
6.	Update command that violate _____ are disallowed.
Option A:	Authorization
Option B:	Integrity constraints
Option C:	Transaction control
Option D:	DDL constraints

7.	A functional dependency is a relationship between or among:
Option A:	Tables
Option B:	Rows
Option C:	Relations
Option D:	Attributes

8.	Relation in this form is free of all modification anomalies.
Option A:	1NF
Option B:	2NF
Option C:	3NF
Option D:	Domain/Key normal form

9.	.... Is the purpose of Indexing in DBMS.
Option A:	establishes an index for a file
Option B:	sorts a file using a single key
Option C:	sorts file using two keys
Option D:	Both A and C

10.	Which of the following is true?
Option A:	B + tree allows only the rapid random access
Option B:	B + tree allows only the rapid Sequential access
Option C:	B + tree allows not only rapid random access but also rapid sequential access
Option D:	B + tree allows rapid random access but slower sequential access

Q2 (20 Marks)	
A	Solve any Two 5 marks each
i.	Find the highest normal form of a relation R(P, Q, R, S, T) with Functional dependency set as (QR->S, PR->QT, Q->T).
ii.	Explain different types of attributes.
iii.	Explain join operation of relational algebra
B	Solve any One 10 marks each
i.	Define Normal forms and explain with suitable example 1NF, 2NF, 3NF, and BCNF.
ii.	Explain different Hashing techniques.

Q3 (20 Marks Each)	
A	Solve any Two 5 marks each
i.	List all functional dependencies satisfied by the relation.

A	B	C
A1	B1	C1
A1	B1	C2
A2	B1	C2

		A2	B1	C1	
ii.	Explain different Data Manipulation commands.				
iii.	Explain different types of Indexes.				
B	**Solve any One** 10 marks each				
i.	Draw an ER diagram for the following case study. Suppose you are given the following requirements for a simple database for the National Hockey League (NHL): • the NHL has many teams, • each team has a name, a city, a coach, a captain, and a set of players, • each player belongs to only one team, • each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records, a team captain is also a player, a game is played between two teams (referred to as host_team and guest_team) and has a date (such as May 11th, 1999) and a score (such as 4 to 2). Construct a clean and concise ER diagram for the NHL database.				
ii.	Explain the steps of an algorithm for ER to relational mapping.				

Q4. **(20 Marks)**	
A	**Solve any Two** 5 marks each
i.	Explain the difference between a strong entity set and a weak entity set along with suitable example?
ii.	Difference between B-Trees and B+Trees
iii.	Explain Trigger with example.
B	**Solve any One** 10 marks each
i.	Explain DBMS architecture in detail.

ii.	Consider following employee database
	
	 Employee (emp-name, street, city, date_of-joining)
	 Work (company_name, city, salary)
	 Manages (emp_name, manager_name, city)
	     i) Modify the database so that 'John' mow lives in Mumbai.
	     ii) Give all employees of 'ABC corporation ' a 10% rise in salary.
	     iii) List all employees who lives in same city as their manager.
	     iv) Find all employees who earn more than average salary of all employees of their company.