

Test Name : CS 301/Database Systems/Term II 2022-23/T2-22-23-CS 301
Name : Vidhu Arora - vidhu.arora@iiitb.ac.in

Test Start Time	Marks Scored	Total Questions
08/03/2023, 18:00:00	63.0 / 70.0	24
Attempted Questions	Correct Questions	Incorrect Questions
23	20	3
Skipped Questions	Pending Evaluation	
1	0	

Answer Script

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INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY

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Main Answer Booklet

1338_IMT2021082

Examinations : Mid Sem

Date : 8/3/23

Student Name : Vidhu Arora

Course Name : DBMS Theory

Student Signature : [Signature]

Invigilator Signature : [Signature]

Roll No : IMT2021082

Course Code : CS301

Additional Sheets :

To be used by Course Instructor

Total Marks	Marks Secured

Course Instructor Signature:

Important Instructions to Students

- Only Blue/Black ink Should be Used.
- Write your Roll Number legibly on every sheet of this booklet in the designated place.
- Students ID card and Hall Ticket are mandatory to appear for exam.
- All requisite details must be filled Clearly on the cover page.
- Adhere to any additional instructions provided by the invigilators.
- Do not leave any blank/ unused space/pages in between your answers. Blank space should be struck out neatly.
- Students should bring his/her own pen/pencils, calculators etc. Borrowing from others during examination amongst students are strictly not permitted.
- Students are not allowed to leave the examination hall without the permission of invigilator or without handing over the answer book to the invigilators.
- Students are required to write question number as per question paper.
- No additional sheets will be issued during the last ten minutes of the examination.

List of Sections

0

Marks Scored : 54.5

Q No.	Q. Type	Status	Marks																												
1	File Upload	✓	2.0 / 2.0	Hide Answer																											
<div>1. NULL values are same as that of blank space or zero. Argue.</div>																															
2	File Upload	✓	3.5 / 4.0	Hide Answer																											
<div>2. Explain relationships and discuss different (four) types of relationships in DBMS.</div> <div>Evaluator Comments<div>Only three mentioned</div></div>																															
3	File Upload	✓	6.0 / 6.0	Hide Answer																											
<div>3. Consider the two relations R and S given below:</div> <table><tr><th colspan="3">R</th></tr><tr><td>A</td><td>B</td><td>C</td></tr><tr><td>a1</td><td>b1</td><td>c1</td></tr><tr><td>NULL</td><td>b2</td><td>NULL</td></tr><tr><td>a1</td><td>b1</td><td>c1</td></tr></table> <table><tr><th colspan="3">S</th></tr><tr><td>D</td><td>A</td><td>F</td></tr><tr><td>d1</td><td>a1</td><td>f1</td></tr><tr><td>d1</td><td>a2</td><td>NULL</td></tr></table> <div>Given that A is the primary key of R, D is the primary key of S and there is a referential integrity between R.A and S.A, discuss all the integrity constraints that are violated.</div>					R			A	B	C	a1	b1	c1	NULL	b2	NULL	a1	b1	c1	S			D	A	F	d1	a1	f1	d1	a2	NULL
R																															
A	B	C																													
a1	b1	c1																													
NULL	b2	NULL																													
a1	b1	c1																													
S																															
D	A	F																													
d1	a1	f1																													
d1	a2	NULL																													
4	File Upload	✓	9.5 / 10.0	Hide Answer																											
<div>4.In an organization several projects are undertaken. Each project can employ one or more employees. Each employee can work on one or more projects. Each project is undertaken on the requirement of a client. A client can request for several projects. Each project can have only one client. A project can use a number of items and an item may be used by several projects. Draw an E-R diagram and convert it to a relational schema.</div> <div>Evaluator Comments</div>																															

relational schema not given for use and cardinality ratio wrong for requests

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5. Explain participation constraint. What are the 2 types of participating constraints? Explain in brief with one example for each.

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6. Explain the different types of keys in database. Use a set of relations (as an example) from a valid Database state of any relational Database schema to explain the various keys.

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7. Mention 2 differences between Unique Key and Primary Key.

8

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4.0 / 4.0

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8. Amit is working in a reputed Database Firm. While working on a project, he comes across a relation given below:

Student_ID	Student_Name	Subject	Marks
2407	Ranjit	Computer	72
2407	Ranjit	Economics	65
2407	Ranjit	Mathematics	79
2408	Anurag	English	63
2408	Anurag	Social Science	75
2408	Anurag	Economics	89

In the above relation, he notices a lot of redundancy. He wants to avoid that. His manager suggests to decompose the relation into two different relations. Help Amit draw the relations.

9

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6.5 / 7.0

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9. Explain briefly:
- i.) Domain constraints
 - ii.) Entity integrity constraints
 - iii.) Referential integrity constraints

Which among the above constraints may get violated if DELETE operation is performed on some relation of a database? Suggest remedies for the same.

Evaluator Comments

"Entity Int. const says
that PK cannot take

10

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10. Consider 3 relations: TRAIN, TICKET and PASSENGER as shown below:

TRAIN

NAME	START	DEST
Paidhani	Delhi	Mumbai
Shatabdi	Hyderabad	Bangalore

Passenger	Madgaon	Panvel
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TICKET

PNR	START	DESTINATION	FARE (in Rs.)	NAME
1011	Delhi	Kota	500	Rajdhani
1012	Hyderabad	Bangalore	1000	Shatabdi
1013	Delhi	Mumbai	1300	Rajdhani
1014	Madgaon	Panvel	100	Passenger
1015	Mumbai	Delhi	1250	Rajdhani
1016	Bangalore	Hyderabad	1000	Shatabdi
1017	Bangalore	Yashvantpur	20	Shatabdi

PASSENGER

NAME	ADDRESS	PNR
Raghavan	#91, MG Road, Madgaon	1014
Neelam	#92, Brigade Road, Bangalore	1017
Srinivasa	#32, Lajpat Nagar, New Delhi	1013
Mayank	#67, ITPL Road, Bangalore	1016

Write the following SQL queries:

(1) Give a list of names of the passengers traveling from the Start to the Destination station of the train. (Note: Do not include the passengers with return journey).

(2) What will be the output of the above command when executed?

Evaluator Comments

3+2

"Train name and

11

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11. Match the following with respect to RDBMS:

(a)	Entity integrity	(i)	Enforces some specific business rule that do not fall into entity or domain.
(b)	Domain integrity	(ii)	Rows cannot be deleted which are used by other records.
(c)	Referential integrity	(iii)	Enforces valid entries for a column.
(d)	User defined integrity	(iv)	No duplicate rows in a table.

Code:				
	(a)	(b)	(c)	(d)
(1)	(iii)	(iv)	(i)	(ii)
(2)	(iv)	(iii)	(ii)	(i)
(3)	(iv)	(ii)	(iii)	(i)
(4)	(ii)	(iii)	(iv)	(i)

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Marks per question : 1.0

Marks Scored : 5.0

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12. Which one is correct with respect to RDBMS?

(A) primary key \subseteq super key \subseteq candidate key

- (B) primary key \subseteq candidate key \subseteq super key
- (C) super key \subseteq candidate key \subseteq primary key
- (D) super key \subseteq primary key \subseteq candidate key

2

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13. Let $R(a, b, c)$ and $S(d, e, f)$ be two relations in which “d” is the foreign key of S that refers to the primary key “a” of R. Consider the following four operations:

I. Insert into R
II. Insert into S
III. Delete from R
IV. Delete from S

Which of the following can cause violation of the referential integrity constraint?

(A) Both I and IV
(B) Both II and III
(C) I, II and III
(D) All of the above.

3

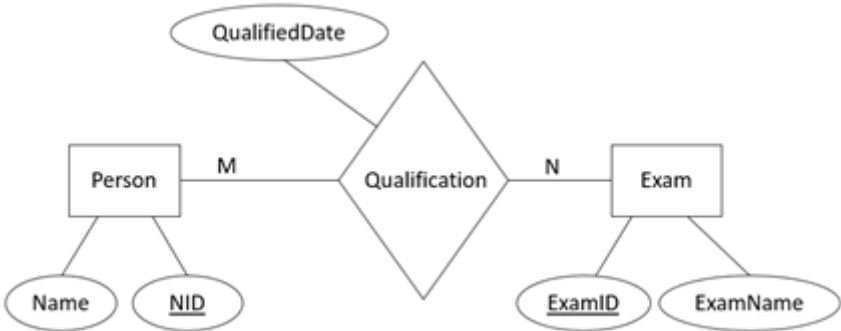
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14. Consider the following Entity Relationship Diagram (ERD):



Which of the following possible relations will not hold if the above ERD is mapped into a relation model?

(A) Person (NID, Name)
(B) Qualification (NID, ExamID, QualifiedDate)
(C) Exam (ExamID, NID, ExamName)
(D) Exam (ExamID, ExamName)

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15. If $D_1, D_2 \dots D_n$ are domains in a relational model, then the relation is a table, which is a subset of

(A) $D_1 \oplus D_2 \oplus \dots \oplus D_n$
(B) $D_1 \times D_2 \times \dots \times D_n$
(C) $D_1 \cup D_2 \cup \dots \cup D_n$
(D) $D_1 \cap D_2 \cap \dots \cap D_n$

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16. The following relation has two attributes A and C where A is the primary key and C is the foreign key referencing A with CASCADE on DELETE.

A	C
2	4
3	4
4	3
5	2
7	2

9	5
6	4

The set of all tuples that must be additionally deleted to preserve referential integrity when the tuple (2,4) is deleted is:

- (A) (3,4) and (6,4)
(B) (5,2) and (7,2)
(C) (5,2), (7,2) and (9,5)
(D) (3,4), (4,3) and (6,4)

6

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17. Given the basic ER and relational models, which of the following is INCORRECT?

(A) An attribute of an entity can have more than one value.
(B) An attribute of an entity can be composite.
(C) In a tuple of a relation, an attribute can have more than one value.
(D) In a tuple of a relation, an attribute can have exactly one value or a NULL value.

Evaluator Comments

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18. Which of the following is a legal expression in SQL?

(A) SELECT NULL FROM EMPLOYEE;
(B) SELECT NAME FROM EMPLOYEE;
(C) SELECT NAME FROM EMPLOYEE WHERE SALARY = NULL;
(D) Both (B) and (C).

Evaluator Comments

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8

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19. The Degree of a relation is

(A) Number of attributes of its relational schema.
(B) Number of tuples stored in the relation.
(C) Number of entries in the relation.
(D) Number of distinct domains of its relational schema.

Evaluator Comments

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Marks per question : 1.0

Marks Scored : 3.5

Q No.	Q. Type	Status	Marks
1	File Upload	⚠	0.0

20. Procedural DML is also called _____ at-a-time DML.

User did not attempt this question

Evaluator Comments

Record

2

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21. There are two types of binary relationship constraints: _____ and _____.

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22. The _____ clause specifies candidate keys.

4

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23. A domain can also have an optional default specification via a _____ clause.

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24. Key is a property of entity set. This statement is True or False?

Evaluator Comments

Explanation Missing