

JK LakshmiPat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination-III, December 2022

Bachelor in Computer Application, Semester I

Roll No.....

CS1116: Database Management and Applications Time: 2 hours

Max. Marks: 30

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Marks are mentioned against each section.

Section-A

(Justify your Answers)

(CO1,2,3) $6 \times 1 = 6$

1. Select distinct sal from emp e1 where 3 = (select count (distinct sal) from emp e2 where e1.sal <= e2.sal);
A. Three MAX salary in the emp table
B. 3rd MAX salary in the emp table
C. Three MIN salary in the emp table
D. 3rd MIN salary in the emp table
2. An attribute A of datatype varchar (25) has the value "BCA2022". The attribute B of datatype char (25) has value "JKLU". Here attribute A has ____ spaces and attribute B has ____ spaces.
A. 7, 25
B. 25, 4
C. 25, 25
D. 7, 4
3. There are two relations X and Y. Relation X has attribute 4 and tuple 2, relation Y has attribute 2 and tuple 3. Indicate the result of the SQL statement
Select count (*) from X, Y;
A. 4
B. 6
C. 8
D. Cannot be calculated from given info
4. Let R be the relational schema with n-attributes R (A₁, A₂, A₃, ... An). How many super keys are possible with candidate keys A₁A₃, A₃A₄?
A. $2^{(n-1)} - 2^{(n-4)}$
B. $2^{(n)} - 2^{(n-3)}$
C. $3 * 2^{(n-3)}$
D. $5 * 2^{(n-4)}$
5. Given the following relation instance.

A	B	C
7	5	1
7	7	4
7	6	4
4	1	1

Which of the following functional dependencies are satisfied by the instance?

- A. $AB \rightarrow C$ and $C \rightarrow B$ B. $BC \rightarrow A$ and $B \rightarrow C$
C. $BC \rightarrow A$ and $A \rightarrow C$ D. $AC \rightarrow B$ and $B \rightarrow A$

6. 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 primary key of R. Consider the following four operations on R and S:
1. Insert into R
 2. Delete from R
 - 3.
 2. Insert into S
 4. Delete from S

Section-B

(CO4,5,6) 6*4=24

1. Check lossless join decomposition and functional dependency preservation for the schema given below:
 R (A, B, C, D, E, F, G, H)
 R1 (ABC), R2 (CDEF), R3 (ABGH)
 FD: {A→B, B→C, C→D, D→EF}
2. Test view serializability for schedule with three transactions T1, T2, T3 on data items D1, D2, D3 as following:
 S: R3(D1)R2(D3)W2(D2)R3(D2)R3(D3)W1(D1)W1(D2)W3(D3)
3. Relational schema as **Book (Title, Price)** with no duplicate entries. Write a SQL query to find the list of all book's title excluding 3 most expensive and 4 least expensive books.
- 4.

X	Z	The following table has two attributes X and Z where X is the primary key and Z is the foreign key referencing X with on-delete cascade (Deletion occurs in both the table then consistency will be remained). Find the set of all tuples that must be additionally deleted to preserve referential integrity when tuple (3, 4) is deleted.
2	4	
3	4	
4	3	
5	2	
7	3	
9	5	
6	4	

5. Find the total number of blocks required in multi-level indexing for the file consists of 16384 records and file is organized unspanned. Record-size is 16 bytes, key-field size is 6 bytes, block size is 512 bytes, block-pointer size is 10 bytes. Also discuss nature of indexing (Dense or Sparse) at each level.
6. Find the highest normal form for the Schema R(ABCDE). Functional dependencies are as follows: {AB→C, C→D, D→E, E→A, D→B}.
