National University of Computer and Emerging Sciences, Lahore Campus

Course:	**Fundamentals of Database Systems**	**Course Code:**	**CS213**
Program:	**BS (EE)**	**Semester:**	**Spring 2021**
Out Date:	**Thurs 15-Apr-2021**	**Total Marks:**	**30**
Due Date:	**Mon 19-Apr-2021**	**Weight:**	
Section	**EE**	**Page(s):**	**2**
Assignment:	**1 (CLO-1 and CLO3)**		

Instruction/Notes:

- Please upload a Microsoft Word file named as your rollnumber on slate by Monday 19th Apr 2021 till 8am.

CLO-1

Question 1 [Marks 10]:

i. [Marks 5] Consider the following 3 relations R, S, and T. In relation R, the attributes A and B are unique and not nullable. In relation S, the attribute F is unique and not nullable. Whereas in relation T, the composition of columns A & F is unique.

R (A, B, C, D, E)
S (F, G, H, I)
T (A, F, H, I)

a) State all the superkeys in the above tables.
b) State all the minimal superkeys (keys) in the above tables.

ii. [Marks 5] Consider the following state of a database. The column dept in employee table is a foreign key which can be null as well. In the employee table please add a row with employee name as yourself and department number of your liking and then answer the questions below:

EMPLOYEE

id	name	dept
1	Ahmed	2
2	Ali	1
3	fatima	3
4	Xinjing	2
5	Sara	NULL
6	<your name>	<your dept>

DEPARTMENT

Dep_id	name	location
1	Sales	Lahore
2	Manufacturing	Beijing
3	Marketing	Dubai

Discuss all integrity constraints violated by each operation, if any, in case the operation is unsuccessful. If the operation is successful, then show the new state of both relations.

All operations are independent of each other.

1. Assuming that the dept foreign key is implemented with set NULL option, delete the department whose dep_id is 2.
2. Assuming that the dept foreign key is implemented with cascading option, update dep-id of manufacturing department to 6.
3. Insert the following row in EMPLOYEE table <10, 'Areesha', 100>.
4. Insert the following row in EMPLOYEE table <1, 'Areesha', 1>.

CLO-3

Question 2 [Marks 20]:

Consider the following schema and write SQL queries to answer the following questions

Employee(empid, name, salary)

SalaryRange(rng_id, salary_from, salary_to, salaryGrade)

Trip (trip_id, empid, cost)

Empid column in Trip table is a foreign key referring to the Employee table

i. List the employee names alongwith the salarygrade they belong to (the salary ranges present in the salaryRange table do not overlap)
ii. Give the name(s) of employees who earn the 2nd highest salary.
iii. Give the name(s) of employees who have not been to any trip
iv. Give the name(s) of employees who have been to the trip(s) with maximum cost.
v. Give the name(s) of employees who have been to both trips with id 5 and trip with id 7.
vi. Give the name(s) of employees who have been to trip with id 5 but not to trip with id 7.