

**Daffodil International University**

Department of Software Engineering

Faculty of Science and Information Technology (FSIT)

Final Examination, Semester: Summer 2019

Course Code: Database System Design Course Title: SE 223

Course Teacher: DTB, NJ, SSH, TRT, NH (PC)

Time: 2:00 Hours Total Marks: 40

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| **1.** | Draw an Entity-Relationship diagram for the following scenario and make sure to specify clearly the attributes of every class and relationship, as well as cardinalities and keys.  The online railway reservation system is an automated system. This system is basically concerned with the reservation and cancellation of railway tickets to the passenger. The need of this system to reduce the manual work and make the system operations more efficient. The users are required to register on the server for getting access to the database and query result retrieval through a profile. Upon registration completion, each user has an account which is essentially referred to as the ‘Profile’ of the customer. The account contains comprehensive information of the user entered during the registration and allows the user to access their past reservations, cancellations, enquire about trains and train schedule, seat availability and make afresh reservations. The user will also be able to update their account details, etc. The master user of this system is the Railway Administrator who can login using a master password and once a user is authenticated as the admin, he/she can access and modify information stored in the database of this system. This includes adding and updating of train, station, train routes and also managing the user and the passenger details. | **6** |
| **2.** | **Consider Bus Terminal Database Tables**  Passengers (P\_ID, P\_name, P\_phone)  Travels (P\_ID, B\_ID, Terminal, Ticket\_Price)  Buses (B\_ID, Route, Driver\_Name, Driver\_Phone)    **Which query is more Efficient for the following Statement and why? Explain.**   1. “Find the Passenger Name who gets in bus from Terminal 01”   **Query:**   1. πP\_name(σTerminal=”01” (σPassenger.P\_ID = Travels.P\_ID))(Passengers \* Travels) 2. πP\_name(σTerminal=”01”) (Passengers) 3. πP\_name(σTerminal=”01”)(Passengers Travels) 4. Find all Drivers’ name who drive in Route 38 and Ticket Price is more than 1200tk.   **Query:**   1. πDriver\_name(σRoute=”38” **^** Ticket\_Price = “1200” )(Buses \* Travels) 2. π Driver\_name(σRoute=”38” **^** Ticket\_Price = “1200” ) (Buses Travels) | **4** |
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| **3.** | 1. Why do we need to use *Normalization* while designing a database? 2. List the rules of normalization process. 3. Convert the following UNF table in to a set of 3NF tables using the rules you have mentioned. | 3  3  7 |
| **4.** | Consider the following relational schema  ***customer****(custno, name, address, tel)*  ***product****(prodno, description, unit price)*  ***sales****(custno, prodno, price)*    Write the SQL commands for the following queries:   1. Find the customer information whose name ends with ‘s’. 2. Find the customer names in alphabetic order without any duplication. 3. Find the product information whose unit price is between 100 and 200. 4. Find the average sales price for each customer number. 5. Find the customer names whose address is ‘Dhanmondi’. 6. Find the customer number with name and address whose name starts with either ‘a’ or ‘s’ or ‘t’. 7. Find the product numbers with description which unit price is more than Tk. 550. 8. Find the customer number with names who bought products which unit price is less than 1000 taka. 9. Find the product number whose unit price is either less than 100 or greater than 1000. 10. Find the customer numbers who bought products of more than Tk.1000. | 10 |
| **5.** | **a)** If we want to build Relation between two or more tables, which key does play vital role in that point? Explain with example.  b) When do we use Inner Join and Full Outer Join?  c) Explain anomalies with proper example. | 2  2  4 |