Daffodil International University

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Final Exam Examination, summer 2021 @ DIU Blended Learning Center
Course Code: CSE333 (Day), Course Title: Software Engineering
Level: 3   Term: 3   Section: All
Instructor: ABC   Modality: Open Book Exam
Date: Saturday 28 August, 2021   Time: 01:00pm-04:30pm
Two and half hours (3:30), Marks: 40

1. Consider the following relational schema and write expression in SQL **OR** in Relational Algebra.   [7.5, CO2]

Employee(SSN, Fname, Lname, Gender, Address, Sex, Relationship, Salary, Designation, Super-SSN, Dno)
Department(Dname, Dnumber, Dlocation,Mgr-ssn, Mgr-start-date)
Project(Pname, Pnumber, Plocation,Budget, Dnum)
Works-on(Essn, Pno, Hours)

a) Write SQL to increase the salary of employees by 2000 who is getting less then 70000tk.
b) Write SQL to find the total number of employee from distinct place in descending order.
c) Write SQL to rearrange Project table according to the descending order of Budget of the project.
d) Write SQL to display all the department number where Number of employee is less than 10.
e) Write SQL to display the project Number having largest hour.

2. **Write expression in SQL for each of the queries using sub query or joining**   [12.5,CO2]

f) Write SQL to display the department's name that gives the second highest salary on average.
g) Write SQL to display the first name, ssn and department name for all Female supervisor.
h) Write SQL to display the employee's name that spent maximum hour in a project.
i) Write SQL to display the lowest paying supervisor's all project details.
j) Write SQL to display the name of all employees and department name who work under Arman Khan and ProductX project.

3. Suppose, you want to withdraw 5000tk money from your DBBL account. You go to DBBL bank booth and enter your card, password and amount of money for withdrawing. After some moment you can see a message "Withdraw successfully done" but you do not get money. You shock and check the account details. In account details, it shown 5000tk is debited from your account few moments ago. You do not understand anything. You go to DBBL bank branch to solve the problem.   [2+2, CO3]
   a) What happened in above case in DBMS aspect? In which state system failure occurs?
   b) What is the way to prevent these types of unwanted situation? Explain with example.

4. Normalize the following table up to Third Normal Form. Be certain to indicate necessary constraints.
[State any assumptions you make about the data shown in this table]   [8,CO4]

Studio	Director	Movies	Budget	Release year	Release date	StudioCity	CityTemp
Walt Disney	Mark Andrews	Brave	18.5 Cr.	2012	10-06-2012	California	18
Warner Bros	Chris Joseph Columbus	Harry Potter	120 Cr.	2001	04-11-2001	London	13
DCEU	Zack Snyder	Batman Vs superman	70 Cr	2016	19-03-2016	Gotham	20
		Suicide Quad	80 Cr.	2021	28-07-2021		
Marvel	Kevin Feige	The Avengers	100 Cr.	2012	03-08-2012	New York	15
		Captain America	150 Cr.	2011	19-07-2011		

Candidate key {Studio, Movies}

5. Perform normalization for following table (1NF,2NF ,3NF)   [8,CO4]

ID	Reg Num	Total marks	Dept	Country	Zip code	City	Mobile	Advisor Id	Name	Rank	Salary
1	1201	600	CSE	bd	12	Mirpor Cantt	012254	71001	Mr. A	Lecturer	50000
2	1202	890	GED	india	45	Dhulipara	134565 487576	71002	Mr. B	Assistant	65000
3	1203	455	CSE	usa	34	Texax	340858	71003	Mr. C	Associate	60000
4	1204	566	PHY	pakistan	46	Agrabad	345666 847566	71004	Mr. D	Assistant	65000
5	1205	900	PHY	canada	38	Alberta	923820	71501	Mr. E	Lecturer	50000
6	1206	100	ACC	Somalia	87	Gold Coast	012254	71006	Mr. F	Assistant	65000

Good Luck ☺