

OLLSCOIL NA hÉIREANN
THE NATIONAL UNIVERSITY OF IRELAND
COLÁISTE NA hOLLSCOILE, CORCAIGH
UNIVERSITY COLLEGE, CORK

Summer Examinations 2011

Computer Science

CS2501: Database Design and Administration

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Answer *all* questions

Paper Total: 40 Marks

Time: 1.5 Hours

Ref. CompanyDB Database

1. Database Concepts and Definition

- (a) In a relational database, define the term *composite key*. *[2 Marks]*
- (b) Identify any composite keys that exist in the CompanyDB database. *[2 Marks]*
- (c) Can a component of a composite key act as a *foreign key*? Explain. *[2 Marks]*
- (d) Specify the SQL statement that would define any one table that contains a composite key. *[4 Marks]*

2. Database Directory / Security

- (a) What is the direct result of issuing the following statement – and what validation applies to the command itself? *[3 Marks]*

```
GRANT RESOURCE
TO Miriam
IDENTIFIED BY allegory
```

- (b) What is the direct result of issuing the following statement – and what validation applies to the command itself? [3 Marks]

```
GRANT SELECT
ON WORKS_ON
TO Miriam
```

- (c) Specify how a user might be allowed to read data from the EMPLOYEE table and modify the Salary values. [4 Marks]

EMPLOYEE	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPERSSN	DNO
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5	
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000	888665555	5	
Alicia	J	Zelaya	999887777	1968-07-19	3321 Castle, Spring, TX	F	25000	987654321	4	
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000	888665555	4	
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000	333445555	5	
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000	333445555	5	
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000	987654321	4	
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000	null	1	

DEPARTMENT	DNAME	DNUMBER	MGRSSN	MGRSTARTDATE
Research		5	333445555	1988-05-22
Administration		4	987654321	1995-01-01
Headquarters		1	888665555	1981-06-19

DEPT_LOCATIONS	DNUMBER	DLOCATION
	1	Houston
	4	Stafford
	5	Bellaire
	5	Sugarland
	5	Houston

WORKS_ON	ESSN	PNO	HOURS
	123456789	1	32.5
	123456789	2	7.5
	666884444	3	40.0
	453453453	1	20.0
	453453453	2	20.0
	333445555	2	10.0
	333445555	3	10.0
	333445555	10	10.0
	333445555	20	10.0
	999887777	30	30.0
	999887777	10	10.0
	987987987	10	35.0
	987987987	30	5.0
	987654321	30	20.0
	987654321	20	15.0
	888665555	20	null

PROJECT	PNAME	PNUMBER	PLOCATION	DNUM
ProductX		1	Bellaire	5
ProductY		2	Sugarland	5
ProductZ		3	Houston	5
Computerization		10	Stafford	4
Reorganization		20	Houston	1
Newbenefits		30	Stafford	4

DEPENDENT	ESSN	DEPENDENT_NAME	SEX	BDATE	RELATIONSHIP
	333445555	Alice	F	1986-04-05	DAUGHTER
	333445555	Theodore	M	1983-10-25	SON
	333445555	Joy	F	1958-05-03	SPOUSE
	987654321	Abner	M	1942-02-28	SPOUSE
	123456789	Michael	M	1988-01-04	SON
	123456789	Alice	F	1988-12-30	DAUGHTER
	123456789	Elizabeth	F	1967-05-05	SPOUSE

CompanyDB: Personnel Database of a Consultancy Company

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3. Database Manipulation

- (a) What is the result of executing the following statement? Explain in plain English. [5 Marks]

```
SELECT FNAME, LNAME, ADDRESS, DNAME
FROM EMPLOYEE, DEPARTMENT
WHERE DNO = DNUMBER
      AND DNAME != 'Administration'
      AND SSN NOT IN
      ( SELECT ESSN
        FROM DEPENDENT
        WHERE RELATIONSHIP IN ('SON', 'DAUGHTER') )
```

- (b) Construct a command in SQL to solve the following query, explaining why it had to employ the (outer) join method. [5 Marks]

“Find the name of each staff member of department 5, together with the project names he/she has worked on (if any).”

- (c) Construct a command in SQL to solve the following query, using (i) the *join* method, and (ii) the *subquery* method. [10 Marks]

“Find the identity name of each staff member who have dependent children”