

AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Course No: CSE4125

Course Title: Distributed Database Systems

Spring 2019 | Quiz – 2 | Marks 20 | Time: 40 Minutes | Set - A

1. Consider the global relational schema **R**(*ID*, *NAME*, *GENDER*, *AGE*)

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Given the following fragmentation schema:

$$R_1 = \pi_{ID, NAME} R$$

$$R_2 = \pi_{ID, GENDER, AGE} R$$

$$R_3 = \sigma_{GENDER=M} (\pi_{ID, GENDER, AGE} R)$$

$$R_4 = \sigma_{GENDER=F} (\pi_{ID, GENDER, AGE} R)$$

$$R_5 = \pi_{ID, AGE} (\sigma_{GENDER=M} (\pi_{ID, GENDER, AGE} R))$$

$$R_6 = \sigma_{AGE>20} (\pi_{ID, AGE} (\sigma_{GENDER=M} (\pi_{ID, GENDER, AGE} R)))$$

$$R_7 = \sigma_{AGE\leq 20} (\pi_{ID, AGE} (\sigma_{GENDER=F} (\pi_{ID, GENDER, AGE} R)))$$

$$R_8 = \sigma_{AGE>20} (\pi_{ID, AGE} (\sigma_{GENDER=F} (\pi_{ID, GENDER, AGE} R)))$$

$$R_9 = \sigma_{AGE\leq 20} (\pi_{ID, AGE} (\sigma_{GENDER=M} (\pi_{ID, GENDER, AGE} R)))$$

Draw the Fragmentation Tree.

2. Consider the following relation **STUDENT**.

SNUM	SNAME	DEPT	SEM
1	A	CSE	1
2	B	EEE	2
3	C	CSE	3
4	D	EEE	4
5	E	CSE	6
6	F	CSE	7

$$STUDENT_1 = \sigma_{DEPT=CSE} STUDENT$$

$$STUDENT_2 = \sigma_{DEPT=EEE} STUDENT$$

$$APP_1 = \text{SELECT } * \text{ FROM STUDENT WHERE DEPT = 'CSE' OR DEPT = 'EEE';}$$

$$APP_2 = \text{SELECT } * \text{ FROM } STUDENT_1 \text{ WHERE SEM = 6;}$$

- a. Write an application that moves a student whose **SNUM** and **DEPT** are given at the terminal to the other department at Level – 2 of distribution transparency. 7
- b. Determine the set of simple predicates P_r to obtain **STUDENT** from its fragments. If **APP₁** and **APP₂** are issued, do you think P_r will be complete? If not, then make necessary changes to make the set complete. Justify your answers. 8