

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

Course No: CSE4125

Course Title: Distributed Database Systems

Fall 2020 | Quiz – 2 | Marks 15 | Time: 60 (50+10) Minutes | Set - B

1. Consider the global relational schema:

Hospital (HNAME, HID, CITY, MGRID, CAPACITY, CHARGE, RATINGS)

Given the following fragmentation schema:

$Hospital_1 = PJ_{HNAME, HID, CITY, MGRID} (Hospital)$

$Hospital_2 = SL_{CAPACITY < 500} PJ_{HID, CAPACITY, CHARGE, RATINGS} (Hospital)$

$Hospital_3 = SL_{RATINGS < 10} SL_{CAPACITY \geq 500} PJ_{HID, CAPACITY, CHARGE, RATINGS} (Hospital)$

$Hospital_4 = SL_{RATINGS \geq 10} SL_{CAPACITY \geq 500} PJ_{HID, CAPACITY, CHARGE, RATINGS} (Hospital)$

Given the following allocation schema:

$Hospital_1$ @ site 1

$Hospital_2$ @ site 1 and 3

$Hospital_3$ @ site 2 and 4

$Hospital_4$ @ site 4

- a. Draw the Fragmentation Tree. 4
- b. Suppose the hospital having **HID = 15**, has done some new construction. Its capacity is improved from **450** to **600**. Write an application that does the necessary updates at Level - 3 of distribution transparency. 5
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

$STUDENT_1 = SL_{DEPT = CSE} STUDENT$

$STUDENT_2 = SL_{DEPT = EEE} STUDENT$

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

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

- a. 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. 6