CS 775/875 Quiz 8 3/24/2021 Name _____

1. Consider the relation instance of R(a,b,c).

a	**b**	**c**
a_1	b_1	c_1
a_1	b_1	c_2
a_2	b_1	c_1
a_2	b_1	c_3

(a) (5) Which of the following FDs hold for this instance of R?

(i) a $\rightarrow$ b YES NO (ii) a $\rightarrow$ c YES NO

(iii) b $\rightarrow$ a YES NO (iv) b $\rightarrow$ c YES NO

(v) c $\rightarrow$ a YES NO (vi) c $\rightarrow$ b YES NO

(vii) ac $\rightarrow$ b YES NO (viii) bc $\rightarrow$ a YES NO

(ix) ab $\rightarrow$ c YES NO (x) abc $\rightarrow$ a YES NO

(b) (0.5) What is a key for R?

(a) (2) Consider a relation R1(a,b,c,d,E) with functional dependencies $a, b \rightarrow c$ and $c, d \rightarrow E$. Suppose there are at most 2 different values for each of a, b, and d. What's the maximum number of different values for E?

i. 2
ii. 4
iii. 8
iv. insufficient information to determine answer

(b) (0.5) What is a key for R1?

2. (2) In the relation WORK(ssn,pno,date,hours), what real-world constraint is captured by $ssn, pno \rightarrow date$?

(a) An employee cannot work on multiple projects on the same date.
(b) An employee cannot work on the same project on different dates.
(c) An employee must work on all projects on the same date.
(d) none of the above information can be inferred from the fd.