30/4/18

INDIAN INSTITUTE OF ENGINEERING SCIENCE AND TECHNOLOGY, SHIBPUR
B.TECH-M.TECH DUAL DEGREE 5th SEMESTER (CS) EXAMINATION, 2018

Database Management Systems (CS – 501)

F. M. = 70 **Time – 3 hrs.**

Answer Question No. 1 and any three from the rest.

1. Choose an appropriate answer/fill in the blank.

i) To include integrity constraint in an existing relation use :
a) Create table b) Modify table c) Alter table d) Drop table

ii) Which of the following is used to delete the entries in the referenced table when the tuple is deleted in parent table?

a) Delete b) On Delete cascade c) Set null d) All of the mentioned

iii) Foreign key is the one in which the _____ of one relation is referenced in another relation.

a) Foreign key b) Primary key c) References d) Check constraint

[3x2]

iv. Consider a relation R = {E, F, G, H, I, J, K, L, M, N} and the set of functional dependencies EF → G, F → IJ, EH → KL, K → M, L → N on R. What is/are the candidate key(s) for R? Show the steps of derivation.

[4]

2. State informal database design guidelines from ER diagram including self relationship, generalization and specialization constructs. Explain with appropriate examples.

[20]

3. a)What is the purpose of normalization? Consider the relation ORDER (order#, parts, supplier, unit-price, qty) with functional dependencies as follows:

order# → parts, supplier, qty
supplier, parts → unit-price

Is it in 3NF? Justify your answer.

b) What is multi valued dependency? Which normal form(s) addresses this? Explain such normal form(s) with the help of example(s).

[10+10]

4. a) How do you test that two decomposed relations are lossless? Consider a relation r with schema R = ABC and set of functional dependencies F = {A → B}. Test whether the decomposition of R into AB and AC has a lossless join.

b) What is dependency preserving decomposition? Write such an algorithm which achieves 3NF also. [10+10]

5. Name two crash recovery techniques. Explain both the techniques considering crashes at different points of transactions.

[20]

6. Write short notes on the following:

a) Distributed DBMS
b) Serializability

[10+10]