Printed pages: 02 Sub Code: RCS-501

Paper Id: 1 1 0 5 0 1 Roll No.

B.TECH.
(SEM 5TH) THEORY EXAMINATION 2018-19
DATABASE MANAGEMENT SYSTEM

Time: 3 Hours *Total Marks: 70*

Note: 1. Attempt all Sections.

SECTION A

1. Attempt *all* questions in brief. **2 x 7 = 14**

a. Explain the difference between a weak and a strong entity set with example.
b. Discuss three level of abstractions or schemas architecture of DBMS.
c. Define constraint and its types in DBMS.
d. Explain the difference between physical and logical data independence with example.
e. What are the different types of anomalies associated with database?
f. Write the difference between super key and candidate key.
g. Why do we normalize database?

SECTION B

2. Attempt any *three* of the following: **7 x 3 = 21**

a. Define Transaction and explain its properties with suitable example.
b. What is schedule? What are its types? Explain view serializable and cascadeless schedule with suitable example of each.
c. What is log file? Write the steps for log based recovery of a system with suitable example.
d. What is deadlock? What are necessary conditions for it? How it can be detected and recovered?
e. Draw overall structure of DBMS and explain its components in brief.

SECTION C

3. Attempt any *one* part of the following: **7 x 1 = 7**

(a) Compare Generalization, Specialization and aggregation with suitable examples.

(b) Write difference between Cross Join, Natural Join, left outer join and right outer join with suitable example.

4. Attempt any *one* part of the following: **7 x 1 = 7**

(a) Define partial functional dependency. Consider the following two sets of functional dependencies F= {A ->C, AC ->D, E ->AD, E ->H} and G = {A ->CD, E ->AH}. Check whether or not they are equivalent.

(b) Define Minimal Cover. Suppose a relation R (A,B,C) has FD set F = {A→B, B→C, A→C, AB→B, AB→C, AC→B} convert this FD set into minimal cover.

5. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a) Explain two phase locking protocol with suitable example.

(b) Write the salient features of graph based locking protocol with suitable example

6. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a) Which of the following schedules are conflicts serializable? For each serializable schedule find the equivalent schedule.

S1: r1(x); r3(x); w3(x); w1(x); r2(x)

S2: r3(x); r2(x); w3(x); r1(x); w1(x)

S3: r1(x); r2(x); r3(y); w1(x); r2(z); r2(y); w2(y)

(b) Write the difference between 3NF and BCNF. Find normal form of relation R(A,B,C,D,E) having FD set F={ A->B,BC->E,ED->A}.

7. **Attempt any *one* part of the following:** **7 x 1 = 7**

(a) Suppose there are two relations

R(A, B, C), S(D, E, F)

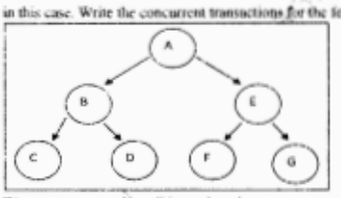
Write TRC and SQL for the following RAs

i) $\Pi_{A, B}(r)$

ii) $\sigma_{B=c}(r)$

iii) $\Pi_{A, r}(\sigma_{C=d}(r \times s))$

(b) What do you mean by multi granularity? How the concurrency is maintained in this case. Write the concurrent transactions for the following graph.



T1 wants to access Item C in read mode

T2 wants to access item D in Exclusive mode

T3 wants to read all the children of item B

T4 wants to access all items in read mode