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Roll no............
Sept-2019
B.Tech. COE

CO 202 Database Management Systems

Duration: 3 Hrs.

Max Marks: 40

NOTE: *Attempt any four questions. Assume the missing data, if any.*

Q1. Given the relational schemas: (2.5x4)

ENROLL(s#, c#, section) – s# represents student number
TEACH (prof, c#, section) – c# represents course number
ADVISE (prof, s#) – prof is thesis advisor of s#
PRE_REQ(c#, pre_c#) – pre_c# is prerequisite course
GRADES (s#, c#, grade, year)
STUDENT(s#, sname) – sname is student name

Give queries expressed in relational algebra for the following queries:

a) List all students taking courses with Smith or Jones.
b) List all students taking at least one course that their advisor teaches.
c) List those professors who teach more than one section of the same course.
d) List the courses that student 'John' can enroll, i.e. has passed the necessary pre_requisite courses but not the course itself.

Q2. (a) Use Armstrong's axioms to prove the soundness of the pseudotransitivity rule.   (5)

(b) Compute the closure of the following set F of functional dependencies for relation schema

$$R = (A, B, C, D, E).$$

$$A \rightarrow BC$$
$$CD \rightarrow E$$
$$B \rightarrow D$$
$$E \rightarrow A$$

P.T.O.

(5)

List the candidate keys for R.

(2)

Q3. a) List the ACID properties.

b) Explain generalization and specialization with the help of suitable example.

(3)

c) What is time stamp? Discuss the working of wait -die and wound-wait transaction.

(5)

so that it is now junior process ani the same error/ problem as earlier which caused its rollback wont occur again

Q4. a) When a transaction is rolled back in timestamp ordering, it is assigned a new timestamp. Explain the reason.

(2)

b) What are the problems caused by deadlocks?

(3)

c) What is cascade less schedule? Why cascadelessness of schedules desirable? Explain your answer.

(5)

Cascadeless schedules are desirable because the failure of a transaction does not lead to the aborting of any other transaction. Of course this comes at the cost of less concurrency.

Q5. a) Explain the use of Checkpoints in recovery scheme.   (2)

b) What are advantages of rigorous two-phase locking protocol over other variants of two-phase locking?   (3)

c). Use Armstrong's axioms to prove the soundness of the pseudotransitivity rule.   (5)

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END