MANIPAL INSTITUTE OF TECHNOLOGY
(Constituent Institute of Manipal University)
MANIPAL-576104

VI SEM- END SEMESTER EXAMINATION (CSE)
Advanced Database Systems (CSE-310.2)

TIME: 3 HOURS 25-05-2011 MAX.MARKS: 50

Note: Answer any full five questions. Missing data may be assumed suitable.

1A. Consider the following two interleaved transactions in schedule(S) with initial value A=100 and B=200.

T1	T2
Read_item(A)	
A=A-50	
Write_item(A)	Read_item(B)
	B=B-10
	Write_item(B)
Read_item(A)	
A=A+10	
Write_item(A)	
	Read_item(B)
	B=B+50
	Write_item(B)

1. Write the update log content.
2. Explain how the recovery is done if the schedule fails after the second Read_item(B) in T2.
3. Explain the method to check whether the give schedule has conflict equivalent serial schedule or not. Using same check whether the above schedule has the conflict equivalent serial schedule or not?

1B. With an example explain block nested-loop join and merge join algorithms used in computing the join of relations. ((1+2+2) + (2+3))

2A. Consider the relations r1(A, B,C), r2(C, D, E), and r3(E, F), with primary keys A, C, and E, respectively. Assume that r1 has 1000 tuples, r2 has 1500 tuples, and r3 has 750 tuples. Estimate the size of r1⋈r2⋈r3, and give an efficient strategy for computing the join.

2B. What is cascadeless schedule? Why is the cascadeless of schedules desirable? Are there any circumstances under which it would be desirable to allow nocascadeless schedule? Explain your answer.

2C. With an example explain how to estimate the size of the natural join. (4+2+4)

3A. Explain the timestamp ordering protocol. When does the Thomas' Write rule is desirable in timestamp-ordering protocol.

3B. Explain log-record buffering and database buffering. (5+5)

4A. Consider the E-R diagram given below which contains composite, multivalued, and derived attributes.
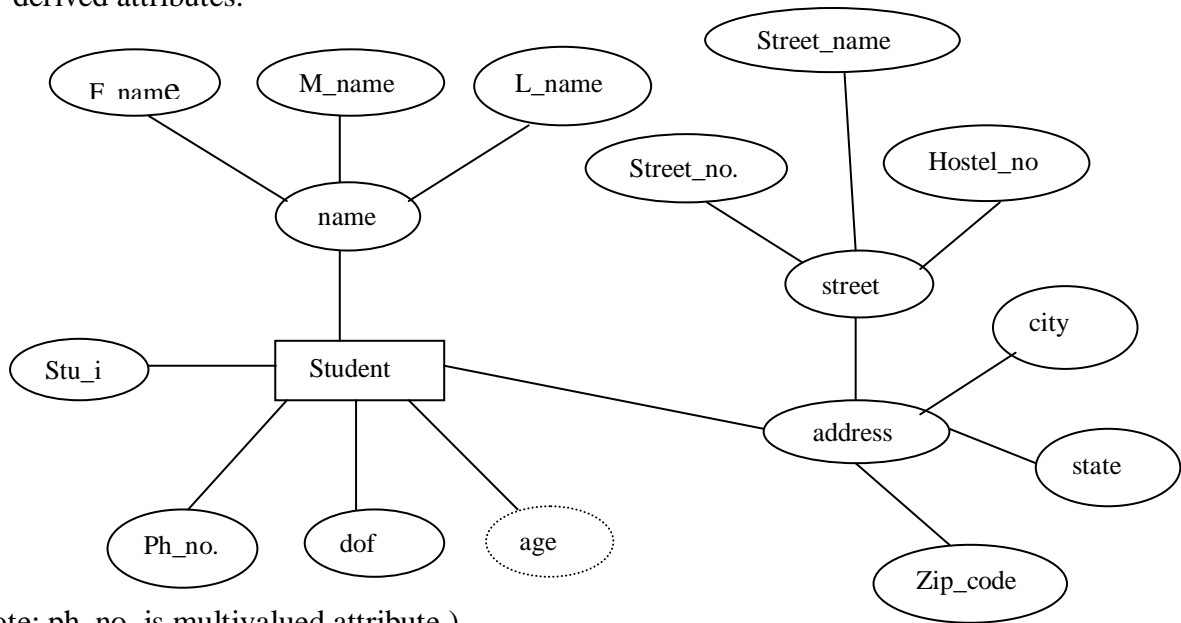
(note: ph_no. is multivalued attribute.)

1. Give an SQL: 2003(object-based database) schema definition corresponding to the E-R diagram.
2. Give constructors for each of the structured types defined above.
3. Write an SQL query to display lastname of all students who stay in " Udupi" city.

4B. How do you transform 1NF relation into nested relation? Explain with example.

((3+3+2) +2))

5A. Explain Two-Phase Commit (2PC) protocol and failures handled by 2PC
5B. Consider a relation that is fragmented horizontally by plant number:
employee (name, address, salary, plant_number)
Assume that each fragment has two replicas: one stored at the New York site and one stored locally at the plant site. Describe a good processing strategy for the following queries entered at the "San Jose" site.
1. Find all employees at the "Boca" plant.
2. Find the average salary of all employees.
3. Find the highest-paid employee at each of the following sites: Toronto, Edmonton, Vancouver, Montreal.
4. Find the lowest-paid employee in the company.   ((2+3)+(1+1+1+2))

6A. Explain the features of Java Database Object model for object persistence in programs.
6B. With an example, explain Range-Partitioning sort and Parallel External sort-merge techniques.   (5+5)

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