Time: 3 Hours   **Total Marks: 80**

N.B. (1) Question No. 1 is compulsory

  (2) Assume suitable data if necessary

  (3) Attempt any three questions from remaining questions

1   (20)

  (a) List and explain operation on files.

  (b) Explain various join operations.

  (c) List and explain allocation techniques for distributed databases.

  (d) What is the need of object oriented database?

  (e) Enumerate the security issues involved in database design.

2 (a) Explain heuristic query optimization with given example: (10)

  Select e_lname

  from employee e, works_on w, project p

  where p.name="database" and p.number=w.pno and

  e.essn=w.ssn and e.bdate >"1997-12-31"

  (b) Explain concurrency control in distributed database.   (10)

3 (a) Consider the following database that has to be distributed: (10)

  Proj (PNO, PNAME, BUDGET)

  PAY (TITLE, SALARY)

  EMP (ENO, ENAME, SALARY)

  ASG (ENO, PNO, RESPONSIBILITY, DURATION)

  (i)   Show 2 examples of horizontal fragmentation.

  (ii)   Show 2 examples of vertical fragmentation.

  (iii)   Show 1 example of derived fragmentation.

  (b) Give difference between Document Oriented Database and Traditional Database.   (10)

4 (a) What are the steps involved in query processing? Why queries are to be optimized? (10)

  With an example explain how queries are optimized.

  (b) Draw and explain mobile computing architecture with respect to mobile database.   (10)

5 (a) Explain hashing techniques in detail.   (10)

  (b) Explain discretionary access control based on granting and revoking privileges.   (10)

6 Write short note on (any two)   (20)

  (a) Measures of query cost

  (b) Two phase commit protocol

  (c) Document oriented database

  (d) Multimedia databases

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