

Special Examinations, 2012  
DATABASE ENGINEERING

Full marks-70

Time: 3hours

Answer Question No.1 which is compulsory and any five from the rest.

The figures in the right-hand margin indicate marks.

Q.1. Answer the following questions: 2x 10 = 20

- (a) What do you mean by data mining? Write any two objectives of data mining.
- (b) Define a B-tree? Write the steps how search starts in this tree structure?
- (c) What is meant by functional dependencies? Give example of trivial and non trivial dependencies .
- (d) For a relation R(A,B,C,D) with the dependency among numeric field values :  $C=2A+B$  and  $D=2B$ , Draw the E-R diagram.
- (e) Difference between candidate key and super key ?
- (f) What is timestamp? If  $TS(T_i) > TS(T_j)$  then which transaction is younger? Justify considering  $TS(T_i)$  as the timestamp of transaction  $T_i$ .
- (g) What is meant by ACID properties of a transaction?
- (h) Distinguish between tuple relational calculus and domain relational calculus.
- (i) For the following set of dependencies:  
{ $A \rightarrow BC$ ,  $B \rightarrow D$ ,  $C \rightarrow DE$ ,  $BC \rightarrow F$ }  
Find primary key of the relation.
- (j) What do you mean by concurrency? Discuss any one of the locking techniques for concurrency control ?

2. Consider the set of relations: (10)

student(name,roll,mark)

score(roll,grade)

Details(name,address)

For the following query:

"Find name & address of students scoring grade 'A'"

Represent it in relational algebra, tuple calculus, QBE & SQL.

3.a) What is meant by normalization ? What is the need of normalization in data base engineering? Explain successive normalization in designing a relational database by taking suitable example . Take a relation and normalize it upto 3 NF . (5)

b) Differentiate between DDL and DML ? Explain with example . (5)

4. a) What is functional dependencies ? How does it relate with multivalued dependencies?

Explain .

b) Describe the steps to reduce an E-R schema to tables. (5)

5. (a) Explain the architecture of data warehouse . (5)

b) Differentiate between object-oriented database and object Relational database. (5)

Q6 a) What do you mean by Locking? Explain the two phase locking with an example. (5)

b) Compare and contrast between data mining and SQL ? (5)

7. a) What is meant by Query parallelism ? Discuss any one of the techniques with its advantages ? (5)

b) What is meant by distributed database ? Explain its merits and demerits? (5)

8. write short notes on any two: (2x5)

(a) Double Buffering

(b) Semi join operation

(c) Database Privacy and security issues?

