53 (CS 713) ADDB

2014

ADVANCED DATABASES

Paper : CS 713

Full Marks : 100

Pass Marks : 30

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer ***any five*** *questions.*

1. *(a)* What is multivalued dependency ? What type of constraint does it specify ? When does it arise ? 2+2+2=6

(b) Given

$$R=\{A,B,C,D,E,F\}$$

$$R1=\{A,B,\}$$

$$R2=\{C,D,E\}$$

$$R3=\{A,C,F\}$$

$$F=\{A\rightarrow B,\ C\rightarrow\{D,E\},\{A,C\}\rightarrow F\}$$

Check whether the decomposition is lossless ? 8

(c) Write the proof of decomposition and transitive (inference) rule. 6

2. (a) When are two sets of functional dependencies equivalent ? Consider the following two sets of functional dependencies :

$F=\{A\rightarrow C,\ AC\rightarrow D,\ E\rightarrow AD,\ E\rightarrow H\}$ and $G=\{A\rightarrow CD,\ E\rightarrow AH\}$. Check whether they are equivalent. 2+8=10

(b) Write an algorithm to find the minimal cover of a set of functional dependencies.

Find the minimal cover for the following set of functional dependencies :

Relation $R=(A, B, C, D, E, F)$

$F1=\{A \rightarrow C, AC \rightarrow D, E \rightarrow AD, E \rightarrow F\}$

5+5=10

3. (a) State the concurrency control and recovery problems encountered by distributed database which are not present in distributed database. 4

(b) Explain query processing in distributed database with a suitable example. 8

(c) How do spatial databases differ from regular databases ? Discuss the different categories of spatial queries. 3+5=8

4. (a) What are the advantages of object oriented database approach for database management ? 5

(b) What do you mean by persistent object ? How object persistence can be specified by naming and reachability ? 2+8=10

(c) What do you mean by active databases ? 5

5. (a) Write the differences between the following : 3×3=9

(i) Clustering and classification

(ii) Data mining and data warehousing

(iii) Horizontal and vertical fragmentation in DDBMS.

(b) Write the apriori algorithm. Illustrate it with a suitable example. 6+5=11

6. Write short notes on the following : ***(any two)*** 2×10=20

(i) Multimedia database

(ii) 4NF

(iii) Goals of data mining and knowledge discovery.
