2013

(December)

ADVANCED DATABASES

Full Marks : 100

Time : Three hours

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

Answer **any five** questions.

1. *(a)* Explain the transparency features of a distributed DBMS. Define and explain the different types of distribution transparency.

   4+3=7

   (b) What is mixed fragmentation ? Give an example. 2+3=5

   (c) Explain query processing in distributed database with suitable examples. Briefly explain the semijoin method. 5+3=8

2. (a) Given below are two sets of FDs for a relation $R(A, B, C, D, E)$. Are they equivalent ?

$$F1 = \{A \to B, AB \to C, D \to AC, D \to E\}$$

$$F2 = \{A \to BC, \ D \to AE\}$$ 7

(b) Write an algorithm to find the canonical cover of a set of FDs. 5

(c) What is lossless decomposition ? Given

$R = \{$SSN, ENAME, PNUMBER, PNAME, PLOCATION, HOURS$\}$

$R1 = \{$SSN, ENAME $\}$

$R2 = \{$PNUMBER, PNAME, PLOCATION$\}$

$R3 = \{$SSN, PNUMBER, HOURS$\}$

$F = \{$SSN $\to$ ENAME,

PNUMBER $\to \{$PNAME, PLOCATION$\}$,

$\{$SSN, PNUMBER $\} \to$ HOURS $\}$

Check whether the decomposition is lossless. 2+6=8

3. (a) What is the difference between persistent and transient objects ? How is persistence handled in typical object oriented database systems ? 3+5=8

(b) What is versioning ? Why is it important ? What is the difference between versions and configurations ? 2+2+3=7

(c) Explain briefly the following terms in object-oriented database terminology :

method, signature, message, visible and hidden attributes. 5

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

(b) Describe how the insert, delete and update commands would be implemented on valid time relations. 6

(c) Describe the concept of deductive database. What is the similarity between rules used in deducted databases and views in the relational model ? 4+2=6

5. *(a)* How does data mining differ from data warehousing ? What are the types of knowledge obtained from mining ?

3+5=8

(b) How does dustering differ from classification ? 4

(c) Give a definition of support and confidence and use them to define an association rule.

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6. Write short notes on the following : *(any two)*

2×10=20

(i) Concurrency control and recovery in DDBMS.

(ii) Multimedia database.

(iii) BCNF and 4NF

(iv) Decision support system.