NEW

2016

BCA

3rd Semester Examination

DATABASE MANAGEMENT SYSTEM

PAPER—2104

Full Marks : 70

Time : 3 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer *Question no. 1* and any *four* from the rest.

1. Answer any *five* questions : 5×2

(a) What is an attribute and tuple? Explain with an example.

(b) Define Data independence.

(c) What is the use LIKE operator. Give an example.

(d) What do you mean by a Hierarchical data model?

(e) What is the role of database administrator?

(f) List some of the disadvantages of a DBMS.

(g) What are weak entities?

2. (a) What is a DBMS? Briefly explain the three level architecture of a DBMS.

(b) What is a SQL? State the difference between DDL, DML and DCL. (2+6)+(2+5)

3. (a) Why normalization is required?

(b) Consider the relation R(A, B, C, D, E, F, G, H) with functional dependency set as

FD = {A $\rightarrow$ C; B $\rightarrow$ CG; AD $\rightarrow$ EH; C $\rightarrow$ DF; A $\rightarrow$ H}

On the basis of the given details, perform following tasks.

(i) Determine key for relation R

(ii) Decompose R into 2NF, 3NF and finally in BCNF.

3+(3+9)

4. (a) For the following problem definition :

The book club has members. The book club sells books to its members. The members places orders for books, which the book club fulfils. Each order contains one or more than one books. The books are written by author (s). The publisher publishes the book. An author can write more than one book and a book can have more than one author. A book is published by a publisher, but a publisher publish many books. A member can place more than one order. The member also can choose not to place an order. The book club sells many books.

(i) List the entities and its attributes.

(ii) Draw an E-R Diagram for the above problem.

(iii) Show the mapping cardinalities among related entities.

(b) Define full functional dependency with an example.

(4+5+3)+3

5. (a) Determine the output when following operations are applied on relations R_1, R_2 given below:

R_1 :

A	B
A_1	B_1
A_2	B_2
A_3	B_3
A_4	B_4

R_2 :

X	y
A_1	B_1
A_7	B_7
A_2	B_2
A_4	B_4

(i) Union ($R_1 \cup R_2$)

(ii) Intersection ($R_1 \cap R_2$)

(iii) Difference ($R_1 - R_2$)

(iv) Cartesian cross-section ($R_1 \times R_2$)

(b) What are integrity constraints ? Explain two types of integrity constraint with the help of an example.

(c) What is the need of Indexing in DBMS ?

6+(2+4)+3

6. (a) What do you mean by the terms "Loss-Less Decomposition" and "Dependency Preserving Decomposition"?

(b) Given R(ABCDEF)F = {AB → CD, C → D, D → E, E → F} D = {AB, CDE, EF}. D is the decomposition of relation R. Check whether the decomposition is preserving dependency or not?

(c) Define primary key, candidate key, super key and foreign key with an example. 5+5+5

7. Write short notes on the following (any *three*) : 5×3

(a) Data Dictionary ;

(b) Generalization and Specialization ;

(c) Join ;

(d) MVD ;

(e) ANSI/SPARC 3 – Level Architecture.

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