CS/B.TECH /EE/EVEN/SEM-6/EE-604B/2015-16

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Paper Code : EE-604 B
DATABASE MANAGEMENT SYSTEM

Time Allotted : 3 Hours   *Full Marks* : 70

The figures in the margin indicate full marks.

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

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) Set of permitted values of each attribute is called

    a) Domain

    b) Tuple

    c) Relation

    d) Schema.

ii) The relation R = (A, B, C) and set of FDs are :

F = (A $\rightarrow$ B, B $\rightarrow$ C). R is decomposed in two different ways : R1 = (A, B), R2 = (B, C). This is

    a) Lossless join decomposition

    b) Dependency preserving

    c) Both (a) and (b)

    d) None of these.

iii) PL/SQL stands for

    a) Procedural Language/Structured Query Language

    b) Primary Language/Simple Query Language

    c) Parallel Language/Simple Query List

    d) None of these.

iv) GRANT and REVOKE are

    a) DDL   b) DML

    c) DCL   d) VDL.

v) DML stands for

a) Data modeling language

b) Data management language

c) Data manipulation language

d) Data modification language.

vi) The complement of Generalization is

a) Specialization   b) Relation

c) Multiplicity   d) None of these.

vii) The project operation in relational algebra is

a) Unary operation   b) Binary operation

c) Ternary operation   d) All of these.

viii) Which of the following is not a function of DBA ?

a) Schema definition

b) Granting of authorization for data access

c) Designing security

d) Defunction triggers.

ix) Oracle is a

a) RDBMS   b) HDBMS

c) NDBMS   d) none of these.

x) In the internal schema of database three tier architecture, the database user is

a) End user

b) Application programmer

c) Database programmer

d) Database administrator.

xi) Cartesian product in Relational algebra is

a) a unary operator

b) a binary operator

c) a ternary operator

d) not defined.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following $3 \times 5 = 15$

2. Define the following terms with suitable examples :

a) Weak entity

b) BCNF $3 + 2$

3. Consider relation R = (A, B, C, D) and functional dependencies A → B, AC → D, D → A, C → A. Find all the candidate keys.

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4. a) Describe the 3-layer architecture of DBMS.

b) What is the difference between Procedural DML and Non-Procedural DML? $3 + 2$

5. Give below are two sets of functional dependencies for a relation R { A, B, C, D, E }. Are they equivalent ?

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

$F = \{ A \to BC, D \to AE \}$

6. What is self join ? Explain with example.

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Consider the following schema : Employee (ENO, ENAME, Department, Designation, DOJ, Salary, Dept_Location).
   Solve the following queries using SQL.

   i) List the employees having Designation as "Manager" and Dept_Location as "Kolkata".

   ii) Set the salary as Rs. 50,000/- having Designation as "Project Leader".

   iii) List ENO, ENAME, Salary of employees having Salary between Rs. 20,000/- to Rs. 30,000/-.

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b) What are DDL, DML and DCL ?

c) Explain aggregate functions in brief.

d) What are triggers ? How to create triggers ?

$(3 \times 2) + 3 + 3 + 3$

8. a) Construct a B + tree for (1, 4, 7, 10, 17, 21, 31, 25, 19, 20, 28, 42) with $n = 4$. Display the final tree structure.

b) Discuss 2-phase locking protocol with example.

$8 + 7$

9. a) Draw the ER diagram for Library Management System.

b) Explain the terms 'generalization' and 'specialization' with example. $8 + 7$

10. Given functional dependency : $F = \{ A \to B, A \to C, CG \to H, CG \to I, B \to H \}$ on relation R = { A, B, C, G, H, I }

a) Find closer F+

b) Find Candidate keys

c) Normalize the table up to 3NF. $5 + 5 + 5$

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11. Write short notes on any *three* of the following :

$$3 \times 5 = 15$$

a) Hashing

b) Definition of super key, primary key, candidate key and alternate key with examples

c) Preservation of dependencies

d) Lossless and lossy join decomposition

e) DBA and functions of DBA.

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