

CS/B.Tech/ECE/odd/Sem-7th/EC-705C/2014-15

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EC-705C**DATABASE MANAGEMENT SYSTEM**

Time Allotted: 3 Hours

Full Marks: 70

*The questions are of equal value
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. Answer any *ten* questions. 10×1 = 10
- (i) NULL stands for
- (A) zero (B) space
(C) garbage (D) absence of any value
- (ii) A normal form in which every determinant is a key is called
- (A) 2 NF (B) 3NF
(C) BCNF (D) 4NF
- (iii) A logical schema
- (A) is the entire database
(B) is the standard way of organizing information into accessible parts
(C) describes how data is actually stored on disk
(D) both (A) and (C)
- (iv) A table joined with itself is called
- (A) join (B) self-join
(C) outer join (D) equi-join
- (v) Which of the following is not a DDL statement?
- (A) update (B) drop
(C) create (D) alter

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- (vi) In the relational model, cardinality is termed as
- (A) number of tuples (B) number of attributes
(C) number of tables (D) number of constraints
- (vii) Domain can be defined as
- (A) value of a field (B) value of a tuple
(C) value of a table (D) none of these
- (viii) The information about data in a database is called
- (A) meta data (B) tera data
(C) hyper data (D) none of these
- (ix) An entity set that does not have sufficient attributes to form a primary key is a
- (A) strong entity set (B) weak entity set
(C) simple entity set (D) primary entity set
- (x) Which of the following situations is detected by a Precedence Graph?
- (A) deadlock (B) serializability
(C) redundancy (D) functional dependency
- (xi) Multi-valued dependency (MVD) is removed in
- (A) 3 NF (B) 4 NF
(C) 5NF (D) BCNF
- (xii) An existing index can be deleted from a database by the statement
- (A) delete (B) alter
(C) drop (D) modify

GROUP B
(Short Answer Type Questions)

Answer any *three* questions.

3×5 = 15

2. (a) Describe the wait-die and wound-wait protocols for deadlock prevention. 2+3
- (b) Define three concurrency problems: dirty read, non-repeatable read, phantoms.

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3. Consider the relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the set of functional dependencies:
 $F = \{AB \rightarrow C, A \rightarrow DE, B \rightarrow F, F \rightarrow GH, D \rightarrow I, J\}$
 Decompose R into 3 NF. 5
4. (a) What is the difference between a database and a table? 2+3
 (b) Why are entity integrity and referential integrity important in a database?
5. Explain two-phase locking protocol. 5
6. With suitable examples, show how recovery in a database system can be done using Log Files with 5
 (a) Immediate updation (b) Deferred updation.

GROUP C
(Long Answer Type Questions)

- Answer any *three* questions. 3×15 = 45
7. (a) Design a Generalization-Specialization hierarchy for a motor vehicle sales company. The company sells motor-cycles, passenger cars, vans, buses. Justify your placement of attributes at each level of the hierarchy. Explain why they should not be placed at a higher or lower level. 8+4+3
 (b) Why are entity integrity and referential integrity important in a database?
 (c) What are the differences between Primary Index, Secondary Index and Clustering Index?
8. (a) Let T_1 , T_2 and T_3 be transactions that operate on the same data items A , B and C . Let $r_1(A)$ mean that T_1 reads A , $w_1(A)$ means that T_1 writes A and so on for T_2 and T_3 . Consider the following schedule: S_1 : $r_2(C)$, $r_2(B)$, $w_2(B)$, $r_3(C)$, $r_1(A)$, $w_1(A)$, $w_3(B)$, $w_3(C)$, $r_2(A)$, $r_1(B)$, $w_1(B)$, $w_2(A)$. 5+6+4
 Is the schedule serializable and why?
 (b) Define BCNF. How does it differ from 3NF? Why is it considered stronger than 3NF?
 (c) Find out the closure of attribute set (AG) , i.e., $(AG)^+$ in R . Set of FD's are as given : $R = \{A, B, C, G, H, I\}$, $F = \{A \rightarrow B, A \rightarrow C, CG \rightarrow H, B \rightarrow H\}$. Is (AG) a super key of R ?

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9. (a) Discuss the external view, internal view and conceptual view in three-tier database architecture. How are these different schema layers related to concepts of logical and physical data independence? 5+3
 (b) Write the difference between procedural and non-procedural query language. 3
 (c) Write the roles of a DBA. 4
10. Consider the following tables : DEPT (DCODE, DNAME), 5+5+3+2
 EMP (ECODE, ENAME, BASIC, DCODE, DT_JN)
 Write down the SQL statements for the following:
 (a) For each department, show DNAME and total basic of the employees in the department.
 (b) Find out the names of the department where no person is working.
 (c) Find out the names of the employees who are working in the department named as 'ABC'
 (d) Find out the maximum basic among the employees who have joined after year 2000.
11. Write short notes on any *three* of the following: 3×5
 (a) Armstrong's Axioms
 (b) Outer Join
 (c) ACID properties of transaction
 (d) View serializability
 (e) Codd's rules.