

DHARMSINH DESAI UNIVERSITY, NADIAD
[FACULTY OF TECHNOLOGY]
Examination [Semester: III (MCA)]
Subject: Database Management System

Date: **3-12-2007**
 Time: **10:00 to 1:00 pm**

Seat No: _____
 Max marks: 60

Section – I

- Q.1 Answer the Following questions. [10]**
- 1) _____ Level of abstraction describes how the data is actually stored. [1]
 A) Physical Level B) Logical Level C) View Level D) None
 - 2) The collection of information stored in the database at a particular moment is called _____ and that the overall design of the database is called database _____. [1]
 - 3) Consider the entity set Employee with attributes employee-name and telephone-number. Give your suggestion weather the attribute telephone-number should be considered either an entity or an attribute. Explain why you have chosen the particular answer. [2]
 - 4) What is the partial key of an entity set? [1]
 - 5) The process of designating subgroupings within an entity set is called _____. [1]
 A) Specialization B) Generalization
 C) Attribute Inheritance D) None.
 - 6) _____ is a process in which we retain or introduce some amount of redundancy for faster data access. [1]
 A) Normalization B) Composition C) Denormalization D) Decomposition
 - 7) _____ constraint requires that an entity belong to no more than one lower-level entity set. [1]
 A) Disjoint B) Overlapped C) Total Generalization D) None.
 - 8) Give the suitable example for aggregation. [2]
- Q.2 Do as directed. [10]**
- 1) How is DBMS better than File processing System? Explain your answer by giving suitable examples. [4]
 - 2) Consider following database and solve the queries using relational algebra expressions. [4]
 Employee {person-name, street, city}
 Works {person-name, company-name, salary}
 Company {company-name, city}
 1) Find the sum of salaries of all employees.
 2) Find the name of all employees who have same street and city as “James”
 - 3) What are the functions of Database Administrator? [2]
- OR
- Q.2 Do as directed. [4]**
- 1) What is derived attribute and multivalued attribute? Explain tabular representation of weak entity set. [4]
 - 2) Explain the tabular representation of generalization. [4]
 - 3) What are the armstrong’s axioms to find logically implied functional dependencies? [2]
- Q.3 Do as directed. [10]**
- 1) What is a Canonical cover? Compute the canonical cover for the given set of functional dependencies. $F = \{A \rightarrow BC, B \rightarrow C, A \rightarrow B, AB \rightarrow C\}$ [4]
 - 2) “The cardinality of relationship affects the placement of relationship attributes.” State True or False. Justify your answer by giving proper example. [4]
 - 3) How will you determine whether the decomposition is loss-less join decomposition? [2]
- OR
- Q.3 Do as directed [4]**
- 1) Explain Byte String representation of variable-length records? Also give the disadvantage of that technique. [4]
 - 2) How the RAID Level 3 and RAID Level 4 works? How it helps in improving reliability and performance? [4]
 - 3) “All the relations that are in 3NF are also in BCNF.” State whether the statement is true of false. Justify your answer. [2]

Section - II

- Q.4 Answer the Following questions. [10]
- 1) What is difference between primary index and secondary index? [2]
 - 2) _____ is a view whose contents are computed and stored. [1]
A) Materialized Views B) Simple Views C) Both D) None
 - 3) The transaction is said to be _____ after the final statement has been executed. [1]
A) Partially Committed B) Committed C) Failed D) Aborted
 - 4) What will be the cost in terms of I/O operation if we use primary index and equality condition on key attribute assuming B+ tree index is used? [1]
 - 5) "Every Conflict Serializable schedule is also a view serializable schedule, but there are view serializable schedule that are not conflict serializable" Explain this statement with example. [2]
 - 6) Which one is NOT TRUE about Immediate database modification technique? [1]
A) Allows modifications to be output to the database while transaction is in the active state.
B) Log records maintain only the new value of data item.
C) Performs Undo(t) if log contains the record <t start> but does not contain <t commit>
D) Performs Redo(t) if log contains both the records <t start> and <t commit>
 - 7) In two-phase locking protocol in _____ phase the transaction may obtain lock but may not release lock and in _____ phase the transaction may release lock but may not obtain lock. [1]
 - 8) B+ tree is called as a balanced tree because, [1]
A) Every search key value must appear at least once in one leaf node.
B) Fanout is same for all nodes.
C) The distance from every leaf node to root node is same.
D) The height of the B+ tree index structure on non key search key is always 3.
- Q.5 Do as directed. [10]
- 1) Construct the B+ tree for the following set of key values [6]
(2,3,5,7,11,17,19,23,29,31) where the fanout is 4.
 - 2) When it is preferable to use a dense index rather than a sparse index? Explain your answer. [2]
 - 3) What are the causes of bucket overflow in hash file organization? [2]
- OR
- Q.5 Do as directed. [4]
- 1) Explain two phase locking protocol. How it ensures conflict serializability? List its limitations if any. [4]
 - 2) Let r1 and r2 be two relations. R1 has 20,000 tuples and r2 has 45,000 tuples. 25 tuples of r1 fit in one block and 30 tuples of r2 fits on one block. Estimate the number of block accesses required, using Nested-loop join and Block-nested-loop join strategies. [4]
 - 3) Clustering is the best approach for file organization that efficiently satisfies every kind of query. State True or False. Justify your answer. [2]
- Q.6 Do as directed. [10]
- 1) Explain deferred database modification technique of log based recovery. [4]
 - 2) What is checkpoint? Explain the process of inserting the checkpoints. Also state the drawbacks of checkpoints. [4]
 - 3) Give the drawbacks of Shadow Paging technique. [2]
- OR
- Q.6 Do as directed [6]
- 1) Construct an extendable hash structure for the following search key values. Hash function is define as $h(x) = x \text{ mod } 8$ and bucket can hold upto 3 records. [6]
Search key values are (2,3,5,7,11,17,19,23,29,31)
 - 2) In terms of distributed data storage explain horizontal and vertical fragmentation with suitable examples. [4]