**Nagarjuna College of Information Technology**

**SET - B**

**Full Marks: 60**

**Pass Marks: 30**

**Time: 3 hrs.**

**Shankhamul -09, Lalitpur**

**Pre-Board Examination 2081**

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| **BIM / Fourth Semester / IT 220: Database Management System** |

***Candidates are required to answer the questions in their own words as far as possible.***

**Group ''A''**

***Brief Answer Questions:* *[10×1=10]***

1. What is the purpose of DBA?
2. Differentiate between specialization and generalization.
3. Define candidate key.
4. What is partial functional dependency?
5. Write a syntax for selection in relational algebra.
6. Write a syntax to create a view in SQL.
7. Define serializable schedule.
8. List states of a transaction.
9. What is a lock point?
10. What do you mean by BigData?

**Group ''B''**

***Short Answer Questions: (Attempt any FIVE Questions)* *[5×3=15]***

1. Discuss logical data independence with example.
2. Explain different constraints of generalization.
3. Explain PROJECT and DIVISION operation of relational algebra with example.
4. Write syntax to create a stored procedure in SQL. Explain with example.
5. Compare NoSQL with RDBMS.
6. Explain properties of a transaction.

**Group ''C''**

***Long Answer Questions: (Attempt any THREE Questions)* *[3×5=15]***

1. Explain structural constraints used in ER diagram with example.
2. What do you mean by concurrency control? Explain timestamp-based protocol with example.
3. What do you mean by undo and redo operation? Explain recovery technique based on immediate update.
4. How do you test candidate key? Given a relation R = {A, B, C, D, E, F} with FD {A→C, C→D, D→B, E→F}, find possible candidate key.

**Group ''D''**

***Comprehensive Question: (Attempt ALL Questions)*  *[2×10=20]***

1. Consider a database system with following schemas:

DEPARTMENT (deptNo, dept\_name, city)

EMPLOYEE (empID, emp\_name, salary)

WORKS (deptNo, empID)

Design an ER diagram for above schemas and write SQL statements for following queries:

**a.** Select all employees whose salary is below Rs. 50,000 and name ends with ‘a’.

**b.** Select the name of all employees who works in Math department.

**c.** Count the number of employees working in each department.

**d.** Find the total amount required to provide salary to employees.

**e.** Find the name of the employee not working in the department located in Lalitpur city.

1. What do you mean by view serializability? Explain with example a schedule not conflict serializable can be a view serializable.

**Nagarjuna College of Information Technology**

**Full Marks: 60**

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**SET - A**

**Shankhamul -09, Lalitpur**

**Pre-Board Examination 2081**

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| **BIM / Fourth Semester / IT 220: Database Management System** |

***Candidates are required to answer the questions in their own words as far as possible.***

**Group ''A''**

***Brief Answer Questions:* *[10×1=10]***

1. What do you mean by instance?
2. Differentiate between sophisticated and specialized user.
3. Define foreign key.
4. What is trivial functional dependency?
5. List any two fundamental operations of relational algebra.
6. Write a syntax to rename a table name in SQL.
7. Define non-serial schedule.
8. List properties of a transaction.
9. Define lossless decomposition.
10. What do you mean by data warehouse?

**Group ''B''**

***Short Answer Questions: (Attempt any FIVE Questions)* *[5×3=15]***

1. Discuss physical data independence with example.
2. Explain different constraints of specialization.
3. Explain JOIN operation of relational algebra with example.
4. Write syntax to create a trigger in SQL. Explain with example.
5. Differentiate between parallel and distributed databases.
6. Explain states of a transaction.

**Group ''C''**

***Long Answer Questions: (Attempt any THREE Questions)* *[3×5=15]***

1. What are the different types of attributes used in ER diagram? Explain how ER diagram is converted to table.
2. Why do we use normalization? Write a procedure to compute closure of attribute sets.
3. What do you mean by concurrent transactions? Explain two phase locking protocol with example.
4. Why database recovery is required? Explain recovery technique based on deferred update.

**Group ''D''**

***Comprehensive Question: (Attempt ALL Questions)*  *[2×10=20]***

1. Consider a database system with following schemas:

DEPARTMENT (deptNo, dept\_name, city)

EMPLOYEE (empID, emp\_name, salary)

WORKS (deptNo, empID)

Design an ER diagram for above schemas and write SQL statements for following queries:

**a**. Select all employees whose salary is greater than Rs. 40,000 and name starts with ‘A’.

**b**. Select the name of all employees who works in IT department.

**c.** Count the number of employees working in each department.

**d**. Find the average salary of the employees.

**e.** Find the name of the employee not working in the department located in Kathmandu city.

1. What do you mean by conflict serializability? How do you test conflict serializability?