**Deerwalk Institute Of Technology**

**Advance Database Management System**

**Class Assignment**

**Submitted By: Submitted To:**

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**1. Explain Object Oriented Database Concepts, What are major differences between OODBs and RDBs.**

Object oriented databases also known as object databases incorporate the object data model to define data structures on which database operations such as CRUD (Create, Retrieve, Update, Delete) operations can be performed. They store objects rather than data such as integers and strings. The relationship between various data is implicit to the object and manifests as object attributes and methods. Object database management systems extend the object oriented programming language with transparently persistent data, concurrency control, data recovery, associative queries, and other database capabilities.

The Object-Oriented Database System Manifesto mandates that a OODBs should be a DBMS, and it should be an object-oriented system. Thus OODB implements OO concepts such as object identity, polymorphism, encapsulation and inheritance to provide access to persistent objects using any OO-programming language.

Differences between OODBs and RDBs.

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| **OODBs** | **RDBs** |
| Object database relies on the OOP. | A relational database relies on the relational model. |
| In an object oriented database each element resembles an object from the object oriented paradigm. | The relational model organizes information in a set of tables each are composed of rows and columns. Each column represents a property and each row represent an entity. |
| Object-oriented databases are good at handling BLOB (Binary Large Object) | BLOB doesn't fit in the Relation Database System. |
| It is new concept. | It is old concept. |

**2.Explain 1st, 2nd, 3rd Normal Form and Boyce Codd Normal Form.**

→ Database Normalization is a technique of reorganizing the datasets in a database.

Normalization is an approach of decomposing tables to eliminate data redundancy.

The main purpose of Normalization is:

a. Eliminating redundant (useless) data.

b. Ensuring data dependencies

There are 3 basic normal forms. They are 1NF, 2NF, 3NF and BCNF (Boyce Codd Normal Form).

**1NF:**

In First Normal Form, no two Rows of data must contain repeating group of information i.e. one cell must have only one value. Each table should be organized into rows, and each row should have a primary key that distinguishes it as unique.

**2NF:**

As per the Second Normal Form a table must be in First Normal Form and there must not be any partial dependency of any column on primary key. It can also be said as, a table is in 2NF if it is in 1NF and every non-prime attribute of the table is dependent on the whole of every candidate key.

Example:

let's suppose we have following relation:

*Product(Manufacturer, Model, ModelFullName, Country)*

The relation can be normalized to 2NF as:

*ProductCountries( Manufacturer, Country)*

*ProductModel(Manufacturer, Model, ModelFullName)*

**3NF:**

Third Normal form applies that every non-prime attribute of table must be dependent on primary key. So this transitive functional dependency should be removed from the table and also the table must be in Second Normal form.

Example:

*Student\_Detail(Student\_id, Student\_name, DOB, Street, city, State, Zip)*

In this table Student\_id is Primary key, but street, city and state depends upon Zip. The dependency between zip and other fields is called transitive dependency. Hence to apply 3NF, we need to move the street, city and state to new table, with Zip as primary key.

*Student\_Detail(Student\_id, Student\_name, DOB, Zip)*

*Address(Zip, Street, City, State)*

**BCNF ( Boyce Codd Normal Form):**

BCNF is a higher version of the Third Normal form. This form handles the shortcomings of 3NF. A 3NF table which does not have multiple overlapping candidate keys is said to be in BCNF.

For a table to be in BCNF, following conditions must be satisfied:

a) R must be in 3rd Normal Form

b) And, for each functional dependency (X → Y), X should be a super Key.