**CIS5430 Midterm Exam II (8 Points)**

**Short Answers the following questions. Don't exceed one page for your submission.**

1) What is the database middleware? List 2 examples

A database middleware is software that allows an application to interoperate with other software without requiring the user to understand and code low-level operations. Here are two examples: Open Database connectivity (ODBC), and Java Database Connectivity (JDBC)

2) What the differences between two-tier and three-tier database architectures?

The major differences is the number of tiers. For instance, a three-tier database architecture has three tiers: Prestation Logic: This the GUI. Handles input and output. Processing Logic: Handles the procedures, functions, and programs (application Server) Storage Logic: Handles all DBMS activities (Database server). However, the two-tier architecture merges both the processing logic and storage logic into a single server. Thus, the user will interface directly with database server.

3) What are the components of a database Web application?

The components of a database web application: Database Server: It host the DBMS. Web Server: Receives and responds to browser requests using the HTTP or HTTPS protocols. Application Server: Software building blocks for creating dynamic web sites Web browser: Client program that sends Web requests and receives web pages.

4) What is the Object-Relational Database?

It is a hybrid of a relational database and the object-oriented database. It extends the concept of a relational database to support object-oriented principles. It must be noted that the data is still stored as relations (tables.)

5) List four features of the Object-Relational Database.

The four features that I want to list are: Abstract/user-defined data type, the construction of object types, Calling defined, compiled and stored methods, Varying array.

6) Complete the following SQL statement using the customer\_t table and order\_t table in PVF database. **Handwriting SQL. No need to use the computer to run SQL.**

--1. Retrieve the number of customers in each state.

Select Customer\_State, \_\_\_\_\_\_COUNT(Customer\_Name)\_\_\_\_\_\_\_\_\_\_\_

From Customer\_T

GROUP BY Customer\_State;

--2. List customers\_name who have placed any orders

SELECT customer\_name

FROM customer\_t \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

INNER JOIN orders\_T ON customer\_T.Customer\_ID =orders\_T.Customer\_ID;\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_