Name:________________________ (TakeHome) **75 Points**	**CSC3610 Advanced Programming - Java** Aurora University Lecturer: W. Kajjumba

Second Exam:
DUE DATE: Tuesday, November 21st 2017

Question1. (2 Points)

What are super keys, candidate keys, and primary keys?

Question2. (2 Points)

What is a foreign key?

Question3. (3 Points)

What is the time complexity of inserting an element into a BST?

Question4. (3 Points)

Describe the following JDBC interfaces: Driver, Connection, Statement, and ResultSet.

Question5. (4 Points)

Describe prepared statements. How do you create instances of PreparedStatement? How do you execute a PreparedStatement? How do you set parameter values in a PreparedStatement?

Question6. (2 Points)

What are the benefits of using prepared statements?

Question7. (3 Points)

Describe how an insertion sort works. What is the time complexity for an insertion sort?

Question8. (5 Points)

Add the elements 4, 15, 29, 101, 13, 2, into a heap in this order. Draw the final heap.

Question9. (5 Points)

What is an AVL tree?

Describe the following terms: balance factor, left-heavy, and right-heavy.

Question10. (3 Points)

For the quick sort, show the partition of the following list using the first element as the pivot.

{45, 34, 342, 102, 3, 5, 35, 29, 244, 34}

Question11. (2 Points)

Describe how a merge sort works. What is the time complexity for a merge sort?

Question12. (2 Points)

Describe how quick sort works. What is the time complexity for a quick sort?

Question13. (2 Points)

Why is quick sort more space efficient than merge sort?

Question. (20 Points)

Design a set of database tables for a pizza restaurant.
The restaurant stores the names, addresses, and phone numbers of its home delivery customers. All the current and previous orders for each customer are stored in the database. An order includes one or more pizzas. A pizza has size, crust type, one or more toppings.

The price of a pizza is the sum of the base price ($12 for a small pizza, $15 for a medium, and $18 for a large pizza), plus the sum of the topping prices. The crust type doesn't affect the price.
List the SQL code creating the tables.

i) Write SQL statements to populate your tables with data.

ii) Give a SQL query that lists all pizza toppings for the pizza restaurant database.

iii) Give an SQL query to find if there is a customer named 'Jimmy Blair’ in the database.

iv) Give an SQL query to find the customer code (or id) for the customer named 'Jimmy Blair’.

v) Give a SQL query that describes a particular order for a particular client, for example, order with order code '6' for client '1'.

vi) How can you calculate the total of an order?

Question20.

Write a Java (GUI) program to implement your pizza restaurant database. The restaurant stores the names, addresses and phone numbers of its customers. All the current and previous orders for each customer are stored in the database. An order includes one or more pizzas. A pizza has size, crust type and one or more toppings.

The price of a pizza is the sum of the base price ($12 for a small pizza, $15 for a medium, and $16 for a large pizza), plus the sum of the topping prices. The crust type doesn't affect the price.

Using the tables you created and populated with data, write a lastName_PizzaOrderingSystem class with a method public void acceptOrder()that asks for the customer information and order, and stores the information in the database. You may provide additional helper classes.
What is the code of your lastName_PizzaOrderingSystem class?

i) Create class named lastNameTest with a main method to test your application.

ii) To run connect your application to the database; you need a java class that registers the jdbc drivers (connector class). Create a lastNameConnector class that will provide the connections to your database.

iii) You are the store manager and want to give a special prize to your best customer. Give an SQL query to find out what customer has the greatest number of orders in the system.

NOTE: Submit necessary files;.java, .sql, and other files used to answer questions. MUST provide screenshots of outputs of each program. NO .class files allowed

GOOD LUCK