Quiz Three

Name: _____

1. (15 Points) Identify the **superkeys** and **candidate** keys of the following table schema: Gear(GearName, Cost, ClassId, Weight)

2. (10 Points) Normalizing a database schema so that it satisfies the conditions of Third Normal Form is said to ensure **lossless decomposition**. What does this mean?

3. (10 Points) Is the following table in Second Normal Form? Why or why not?

Students

IDSt	LastName	IDProf	Prof	Grade
1	Mueller	3	Schmid	5
2	Meier	2	Borner	4
3	Tobler	1	Bernasconi	6

4. (15 Points) Draw a simple diagram showing the three layers of an application architecture, and explain what each layer contributes to the overall database application.

5. (10 Points) When writing a database application, explain the pros and cons of:
    a. Opening a new connection to the database every time you need to access the database
    b. Opening one connection to the database, and leaving it open

6. (10 Points) When a database application accesses the database, and executes a stored procedure or query from JDBC, a **`ResultSet`** is returned. Explain why a **`ResultSet`** should be parsed into another **data structure**.

7. (5 Points) What is a **partial dependency**, and why are **candidate keys** useful for identifying them?

8. (5 Points) Third Normal Form ensures that there are no transient dependencies. What does this mean?

9. (5 Points) What is needed to guarantee a database schema is in First Normal Form?

10. (15 Points) Provide an ER-diagram for the following problem, ensuring that the database is in 3NF. Note this problem has been taken from your in class exercise.

    You have been asked to design a database to plan a holiday party for your company. You have been given the following requirements by your manager, who is most definitely not a party planner, and most definitely not an engineer:

    a. *Decorate the conference room*
    b. *Make sure there is food that every can eat*
    c. *Make sure there is music people will like*
    d. *There should be games with prizes*
    e. *Everyone should leave with a gift*