Read this before starting!

- The total possible score for this test is 50 points.
- This test is closed book and closed notes.
- A summary of MySQL commands can be found at the bottom of this page.
- Please turn off all cell phones & pagers during the test.
- You may NOT use a calculator. Complex numeric calculations may be left in the form of an expression.
- All answers must be placed in space provided. Failure to do so will result in no credit for answer.
- If you perform written work on the back of a page in this test, indicate that you have done so in case the need arises for partial credit to be determined.
- Statement regarding academic misconduct from Section 5.7 of the East Tennessee State University Faculty Handbook, June 1, 2001:

"Academic misconduct will be subject to disciplinary action. Any act of dishonesty in academic work constitutes academic misconduct. This includes plagiarism, the changing of falsifying of any academic documents or materials, cheating, and the giving or receiving of unauthorized aid in tests, examinations, or other assigned school work. Penalties for academic misconduct will vary with the seriousness of the offense and may include, but are not limited to: a grade of 'F' on the work in question, a grade of 'F' of the course, reprimand, probation, suspension, and expulsion. For a second academic offense the penalty is permanent expulsion."

SQL/MySQL Syntax:
- INSERT INTO tablename (fieldname [, fieldnames]) VALUES (value [, values])
- DELETE FROM tablename WHERE fieldname=value
- UPDATE tablename SET fieldname=value WHERE fieldname=value
- USE database
- SHOW TABLES
- CREATE TABLE tablename (field1 data_type [NULL/NOT NULL], field2 data_type [NULL/NOT NULL], ...)
- DROP TABLE tablename
- SELECT [ ALL | DISTINCT] *| COLUMN1[, COLUMN2 ] FROM TABLE1 [ , TABLE2 ] WHERE [CONDITION1 | EXPRESSION1][ AND|OR CONDITION2 | EXPRESSION2 ] ORDER BY fieldname [, fieldnames] [ASC|DESC] LIMIT [start,] size
All problems on this test refer to the three tables shown below that are part of a relational database.

<table>
<thead>
<tr>
<th>Table name: enrolled_students</th>
</tr>
</thead>
<tbody>
<tr>
<td>last_name</td>
</tr>
<tr>
<td>Smith</td>
</tr>
<tr>
<td>Lawrence</td>
</tr>
<tr>
<td>Walker</td>
</tr>
<tr>
<td>Thomas</td>
</tr>
<tr>
<td>Jones</td>
</tr>
<tr>
<td>Harriet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table name: majors</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table name: gradebook</th>
</tr>
</thead>
<tbody>
<tr>
<td>student_id</td>
</tr>
<tr>
<td>11011034</td>
</tr>
<tr>
<td>11560795</td>
</tr>
<tr>
<td>11443985</td>
</tr>
<tr>
<td>11654698</td>
</tr>
<tr>
<td>11778843</td>
</tr>
<tr>
<td>11900023</td>
</tr>
</tbody>
</table>

Here are some additional comments about the above table. First, the tables are only partial tables. Assume there is more data. Second, enrolled_students and gradebook could probably have been the same table, but they were kept separate for reasons of security, i.e., not wanting people who had access to the roll also have access to the gradebook. Third, the table majors could be made unnecessary by simply using the char_code directly for the major_id in enrolled_students. The problem with that is that if a char_code gets changed, you would have to go through all of the enrolled students and manually make the change instead of making the change in one place, i.e., the majors table.

1. What score did Martha Jones get on Test 2 (T2)? (2 points)

2. Which field would serve best as the primary key for the enrolled_students table? (Note that there are actually 2 answers, but one is better than the other.) (2 points)

3. Which field(s) would serve best as the primary key for the gradebook table? (2 points)

4. If we wanted to add a field to identify the student's level, i.e., freshman, sophomore, junior, or senior, which table should we use? (2 points)
   a.) enrolled_students  b.) majors  c.) gradebook  d.) need to add a fourth table

5. If we wanted to add a field to identify properties of the class such as instructor name, meeting time, or assigned room, which table should we use? (2 points)
   a.) enrolled_students  b.) majors  c.) gradebook  d.) need to add a fourth table
6. What SQL data type would you assign to the field `id` in the table `majors`? Be as specific as you can. There will never be more than 256 majors. (2 points)

   a.) BIT  b.) TINYINT  c.) INTEGER  c.) BIGINT  d.) FLOAT  e.) DATE
   f.) DATETIME  g.) YEAR  h.) CHAR  i.) VARCHAR  j.) TEXT  k.) ENUM

7. What SQL data type would you assign to the field `char_code` in the table `majors`? Be as specific as you can. This field will always have exactly 4 characters. (2 points)

   a.) BIT  b.) TINYINT  c.) INTEGER  c.) BIGINT  d.) FLOAT  e.) DATE
   f.) DATETIME  g.) YEAR  h.) CHAR  i.) VARCHAR  j.) TEXT  k.) ENUM

8. Write the SQL statement to create the table `majors`. (3 points)

9. Complete the partial MySQL select statement below in order to display all fields from all records contained in the table `enrolled_students` sorted by `last_name` then by `first_name`. (3 points)

   ```sql
   select * from enrolled_students ____________________________
   ```

10. Complete the partial MySQL select statement below in order to display all fields from records 2, 3, and 4 of the table `enrolled_students`. (Note that the record numbers identifies the position of the record within the table, the first record being position 0.) (3 points)

    ```sql
    select * from enrolled_students ____________________________
    ```

11. Complete the partial MySQL select statement below in order to display all fields of the single record contained in `enrolled_students` with a `user_id` equal to "zmtj555". (3 points)

    ```sql
    select * from enrolled_students ____________________________
    ```

12. Complete the partial MySQL select statement below in order to display all fields of records contained in `enrolled_students` with a `student_id` containing '10' as the second and third digit. (3 points)

    ```sql
    select * from enrolled_students ____________________________
    ```

13. Complete the partial MySQL select statement below in order to join the tables `enrolled_students` and `gradebook` to display the students' names and their corresponding test grades. (4 points)

    ```sql
    select last_name, first_name, T1, T2, T3 from enrolled_students, gradebook where ____________________________
    ```

14. Write the SQL statement to output the student_id and the result of the final grade calculation \((T1*0.4)+(T2*0.2)+(T3*0.4)\) from the table `gradebook`. (4 points)
15. In the space below, write the output from the following MySQL statement: (2 points)

   `select student_id from gradebook where T1 > 80;`

16. In the space below, write the output from the following MySQL statement: (3 points)

   `select student_id, T1+5 from gradebook where T1 between 70 and 80;`

17. Identify all three syntax errors in the MySQL command below. (3 points)

   `select enrolled_students.last_name, enrolled_students.first_name, majors.char_code
   from enrolled_students, majors where (enrolled_students.majorid = majors.id) and
   (majors.char_code = 'CSCI');`

18. The data type definition DECIMAL(10, 4): (2 points)
   a.) defines a decimal value between 4 and 10.
   b.) defines a ten digit base four value.
   c.) defines a four digit base ten decimal value.
   d.) defines a ten digit fixed point decimal value with 4 digits after decimal point.
   e.) is an illegal data type definition.

19. In the client/server side model, having a middle layer provides: (circle all that are true) (3 points)
   a.) ability to access more than one database with a single transaction
   b.) ability connect to many different types of data sources
   c.) ability to prioritize requests before they reach the data base
   d.) improved security