The following are examples of the types of questions you can expect to see on the midterm exam – the actual exam will be worth 100 points total, and you will have one hour and 15 minutes to complete it.

T/F questions, and multiple choice questions with a single answer will be worth 2 points – multiple choice questions with multiple correct answers will typically be worth 4 points (regardless of the number of true answers).

**Part 1 of 2 - Short answer / multiple choice / T-F**

1. (2 pts) (T/F) The type of information that one gets from a database may depend on the context within which it is actually processed.

2. (4 pts) Which of the following are typical advantages of database systems? (Select all that apply):
   a. Data independence from applications
   b. Improved data sharing
   c. Isolation of data in different systems
   d. Better data consistency
   e. Enforcement of standards across multiple data sets

3. (2 pts) Which of the following is the most appropriate job description for a database designer? (Select only one)
   a. Oversees general operations of a database system
   b. Designs and implements application programs to use the data in a database
   c. Designs a database's structure and performs data modeling
   d. Provides subject area knowledge and business rules to define a database
   e. Manages a database management system

4. (2 pts) (T/F) A relation in second normal form does not have any functional dependencies between two (or more) non-key attributes.
5. (2 pts) Normalization is a process for evaluating and correcting table structures to minimize ________
   a. the number of attributes
   b. the number of new tables created
   c. data redundancies
   d. the need for complex SQL statements
   e. primary key values

6. (2 pts) Each student is assigned one of the five different advisors that work in the College of Business. Each advisor advises between 30 and 40 students total. The relationship of students to advisors is thus a _____ relationship.

   \[
   \begin{array}{ccc}
   \text{Advises} & \text{Advisor} & \text{Student} \\
   \end{array}
   \]

   a. one-to-one
   b. many-to-many
   c. one-to-many
   d. strong
   e. derived

7. (2 pts) (T/F) A relation may contain multiple candidate keys

8. (2 pts) The \textit{cardinality} of a relationship is:
   a. The number of instances of one entity that can be associated with each instance of another entity
   b. The association between instances of two or more entity types
   c. The number of shared attributes in the relationship
   d. The number of entities involved in the relationship
   e. The number of different values for the foreign key in the dominant entity

9. (2 pts) When an entity type is mapped to a relation, what is each corresponding entity instance effectively mapped to?
   a. An attribute
   b. A relation
   c. A tuple
   d. A primary key
   e. An association
10. (4 pts) What are the main types of data anomalies that a well-designed database will help to avoid? (Select all that apply)
   
   a. Update
   b. Insert
   c. Select
   d. Delete
   e. Edit

11. (4 pts) Which of the following are determinants in this dependency diagram? (Select all that apply)

   a. C1
   b. C2
   c. C3
   d. C4
   e. C5

12. (2 pts) When this schema is converted to second normal form, how many of the resulting relations will contain the C1 attribute?

   a. 1
   b. 2
   c. 3
   d. 4
   e. 5
Part 2 of 2 - ER Mapping and Normalization

In this part of the exam, you will be given a description of a business scenario, as in the in-class examples that we worked through, along with a partially complete ER or EER diagram. You will be asked multiple choice questions about how that diagram should be completed, given the scenario that is described, and you will also be asked multiple choice questions about its normalization.