**WS A-4 – TOPIC A REVIEW**

TOPIC

A



**TIME TO COMPLETE: 2 HOURS**

Please show your work, that way I know you’re able to replicate it on the exam.

***MAX MARKS: 46***

1. Explain the difference between data and information in the context of databases. Give an example to support your answer. [2]
2. Describe two reasons why an organization may switch from using spreadsheets to a database system as it grows. [2]
3. What is the purpose of the ACID properties in a database transaction? Briefly explain each property. [4]
4. Define and give an example of each of the following:
   1. Entity [1]
   2. Attribute [1]
   3. Relationship [1]
5. Discuss why consistency and integrity are important in database design. How do they differ? [4]
6. What are the main functions of a DBMS? List and briefly describe three. [3]
7. Imagine a customer table in a database. What would be a suitable primary key and why is it important? [2]
8. Differentiate between a conceptual schema and a physical schema. [2]
9. Describe the difference between a secondary key and a candidate key. [1]
10. Consider the following unnormalized table:

Club(ClubID, ClubTitle, TeacherID, TeacherLastName, TeacherFirstName)

Describe the steps you would take to convert this into third normal form. Explain your reasoning. [4]

1. You are tasked with creating a library database to track which books are borrowed by which students. Describe how you would use a supporting table and foreign keys in this many-to-many relationship. [3]
2. Discuss the advantages and disadvantages of storing images as BLOBs. [2]
3. What is the cardinality and modality of a professor/course relationship at a university? [1]
4. Given the following database tables:

Books(BookID, Title, Genre, AuthorID)

Authors(AuthorID, FirstName, LastName)

Borrowers(BorrowerID, FirstName, LastName, PhoneNumber)

Borrows(BorrowID, BorrowerID, BookID, CheckoutDate, ReturnDate)

Write an SQL query to list the titles of all books borrowed by a borrower with the last name Smith [4]

1. Discuss two ethical concerns related to large-scale data mining and matching in organizations. Suggest one way to address each concern. [4]
2. Explain why a DBA might want to roll back a database. [2]
3. Name three methods used to keep data secure in a database and describe how they work. [3]