1. (5 points) What is JSON?
2. (5 points) What is XML?
3. (5 points) What are the advantages of a flat file database?
4. (5 points) What are the advantages of a JSON, YAML, and XML?
5. (5 points) Give me a concrete example of a flat file database?
6. (5 points) Convert your example to a JSON file.
7. (5 points) Convert your example to a XML file.
8. (5 points) In data models, what are entities?
9. (5 points) Define data modeling.
10. (5 points) What is a candidate key?

11. (5 points) Describe conceptual, logical, and physical data modeling.

12. (5 points) Create a data model for a health club. Among the entities one might identify for this model is one for PATRON and one for LOCKER. The assignment of lockers to patrons can be represented by a relationship LockerAssignment. You can assume that no two patrons share a locker and that no patron will be assigned more than one locker.

13. (5 points) Create a data model for a college that has entities DEPARTMENT and SCHOOL and a relationship BelongsTo between DEPARTMENT and SCHOOL to represent the organization of the college in terms of departments within schools. You can assume that no department can belong to more than one school.

14. (5 points) Continuing with our data model for a college, create the relationship Enrollment between the entities STUDENT and COURSE that represents the enrollment of students in courses.

Consider the following entities. Underlined fields signify a primary key. Italics signify a foreign key. All foreign keys cannot be NULL unless otherwise specified. You may choose the data types, but you must be consistent.

STUDENT(SID, LastName, FirstName, Major, Rank, GPA, AdvisorID)
FACULTY(FID, LastName, FirstName, Rank, DepartmentID)
DEPARTMENT(DID, DeptName, OfficeLocation, ChairID). ChairID can be NULL.
COURSE(CID, Dept, Title, CreditHrs)
SECTION(SectID, CourseID, SectionNumber, Semester, Year, InstructorID)
CLASS(SectID, StudentID, Grade). Grade can be NULL.

15. (5 points) Write a create table SQL statement for the SECTION table. Please use multiple lines for each field.

16. (5 points) Write an alter table statement to change the name of STUDENT table to SCHOLAR.

17. (5 points) Write the SQL code to insert the CS department and Paul Anderson from the CS Department into the database.

18. (5 points) If I have an FID of 123 in the FACULTY table, and you have an SID of 456 in the STUDENT table, write the update statement that makes me your advisor.

19. (5 points) Write the SQL code to find the minimum GPA of all of the students currently registered for SectID = 8.

20. (5 points) Write the SQL code to DELETE all students from the CLASS table with a grade of 0.
21. (5 points) Write the SQL code to generate a list of students (LastName) who beat their class averages. The same student can show up multiple times if they are registered for more than one class.

22. (5 points) What is the goal of normalization?

23. (5 points) What is the goal of the semantic web?

24. (5 points) What is RDF?

25. (5 points) Diagram and create a table that is not in the first normal form. Clearly label the candidate key using an underline. Then clearly explain in words or on the diagram why it doesn’t satisfy the first normal form. Then normalize the table. Indicate the candidate keys and why it is now normalized.

26. (5 points) Diagram and create a table that is not in the second normal form. Clearly label the candidate key using an underline. Then clearly explain in words or on the diagram why it doesn’t satisfy the first normal form. Then normalize the table. Indicate the candidate keys and why it is now normalized.

27. (5 points) Diagram and create a table that is not in the third normal form. Clearly label the candidate key using an underline. Then clearly explain in words or on the diagram why it doesn’t satisfy the first normal form. Then normalize the table. Indicate the candidate keys and why it is now normalized.

28. (5 points) State definition and give an example of a RDF class.

29. (5 points) State definition and give an example of a RDF subclass.

30. (5 points) State definition and give an example of a RDF transitive property.

31. (5 points) State definition and give an example of a RDF symmetric property.

32. (5 points) State definition and give an example of a RDF reflexive property.

33. (5 points) State definition and give an example of a RDF existential restrictions.

34. (5 points) State definition and give an example of a RDF enumerated class.

35. (5 points) State definition and give an example of a RDF cardinality restriction.

36. (5 points) State definition and give an example of a RDF irreflexive property.

37. (5 points) State definition and give an example of a RDF individual.

Use the following triples to answer the remaining questions: 
38. (10 points) Write a SPARQL query to return all the triples

39. (10 points) Write a SPARQL query that returns the given name of people with family names of Jones.

40. (15 points) Write a SPARQL query that returns the family name of people with full names of Sarah Jones.

41. (15 points) Write a SPARQL query that returns the given name of people with family names that contain the letter r. HINT: use the filter command

42. (5 points) Does MySQL provide any security features? If so, what are some of them.

43. (5 points) Compare and contrast a transaction based database versus a database created for analytics (e.g., a data warehouse).