1. Create an ER diagram of a strong entity (called E) with a multivalued attribute (M), a primary key (K) and a derived attribute (D).

2. Create an ER diagram of a relationship (R) between two entities (E1 and E2). R has an attribute (A). Entities in E1 may participate in R with any number of E2 entities (including none), but each E2 entity must participate exactly twice.

3. Create an ER diagram of an aggregation of Question 2. You can ignore attributes and cardinality for this question.
4. Create an ER diagram of a generalization (G) of two entities (E1 and E2). Both E1 and E2 have the same primary key (K), but E1 has a composite attribute (C) composed of two attributes (A and B), while E2 has another attribute (D). An entity cannot be both E1 and E2, but it can be G. If K is even, the entity is in E1, otherwise it is E2.

5. Create an ER diagram with a strong entity S, a weak entity W, and any necessary relationship R. The primary key of S is K and the discriminator is D.
6. Create all tables needed for the ER diagram. Any reasonable data type is ok for domains.
7. What is an SQL injection attack? (4)

8. What is the definition of 3NF? (4)

9. What is the definition of BCNF? (4)

10. What are the sufficient conditions for 4NF? (4)

11. What are the sufficient conditions for 5NF? (4)

12. What is the definition of lossless join? (4)

13. What is the definition of dependency preserving? (4)
14. Consider the relation \( R = (A, B, C, D, E) \) with the domain of each attribute is integer and the functional dependencies \( \mathcal{F} = \{AB \rightarrow C, CD \rightarrow E, C \rightarrow A\} \).

(a) Find a 3NFLJDP decomposition for \( R \) using the algorithm presented in class.

(b) Find a BCNFLJ for \( R \) using the algorithm presented in class.