Final Exam

Multiple choice Questions

Please select the correct answer to each question. (1 point each)

Question 1. What Python collection takes unique elements?

a) Array
b) Tuple
c) List
d) Set

Question 2. What JOIN process is always reversible?

a) Right Join
b) Left Join
c) Outer Join
d) Inner Join

Question 3. What SQL operator is applied after aggregation?

a) SELECT
b) HAVING
c) FROM
d) WHERE

Question 4. What Python operator can take an "else:" block ?

a) if
b) for
c) while
d) all three

Question 5. What part of a Django project manages the routing of the project?

a) manage.py
b) urls.py
c) wsgi.py
d) asgi.py

Short Answer Questions

Please determine the truth of the statements below. You should explain why any of the statements is wrong then correct it.

Question 6. In PostgreSQL, we can store numbers in the format of 1234.56 in a NUMERIC(4,2) data type. (2 points)

Question 7. The select operator (σ) in relational algebra, works the same as the SELECT command in PostgreSQL. (2 points)

Question 8. Django engine does not process (.html) files and shows them as is. (2 points)

Question 9. ER diagrams show the tables that exist in a database. (2 points)

Question 10. Minimal candidate keys are called superkeys in database theory. (2 points)

Question 11. Many-to-Many relationships can involve more than two entity sets. (Bonus 2 points)

Comprehensive Questions

Please answer following questions in detail.

Question 12. What are the main components of the MVT design pattern, and how can using it help us develop a solution. (8 points)

Question 13. What is the advantage of using normal forms in a schema design, and why would we decide to violate a normal form? (8 points)

Question 14. Based on the table below, mention one lossless decomposition and one lossy decomposition. For each decomposition, you should try to rebuild the initial table to prove your point. (6 points)

A	B	C
a1	b1	c1
a1	b2	c2

TABLE 1. Table of R=(A, B, C)

Question 15. Explain how we perform aggregation in MongoDB mentioning three of its operators. You do not need to write precise syntax. (8 points)