



CSE 204 – Midterm

April 18, 2019

Name Surname:

ID:

S1 (20)	S2 (20)	S3 (20)	S4 (20)	S5 (20)	Total (100)

Rules:

- You are allowed one A-4 sized sheet of paper with handwritten notes on it
- Lecture notes, text books, or any similar materials CAN NOT be used during the exam.
- All electronic devices (including cell phones) must be switched off during the exam. In case you use an electronic device, your exam booklet will be taken and your exam score will be 0.
- The duration of the exam is **110 minutes**, starting at **10.30** and ending at **12.20**.

Instructions:

- Read each problem carefully.
- If you need extra paper, please notify the instructor or proctor
- This exam has 5 sections. Please make sure that all pages are included in your booklet.

S1 The “Cheat Sheet” Part (20 points)

Give a simple definition or an example for the following terms/concepts.

Note: This must be written in your own words. Anything copied from the slides/text will be considered as incorrect.

1. Referential Integrity
2. Primary Key
3. Foreign Key
4. Null
5. View
6. Strong and Weak Entity Type
7. Fan Trap
8. Chasm Trap
9. Base Relation
10. Difference between Functional Dependency and Full Functional Dependency

S2 Abby someone. Abby who?... Abby... Normal. (20 points)

Beginning with the following un-normalized dataset in a relation called DepartmentCourse, produce a 3NF version of the database with the same data. You must show the following:

1. Identify a Candidate Key for the DepartmentCourse relation
2. Functional dependencies (For simplicity, you may use the lettered columns above the column names for this part)
3. Identify any partial dependencies that exist.
4. Identify any transitive dependencies that exist
5. Identify Primary Keys and any Foreign Keys in your final 3NF relations

DepartmentCourse

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>	<u>H</u>	<u>I</u>	<u>J</u>
Dept	Dept Name	Faculty Name	Faculty Email	Course ID	Course Name	Section	Instructor	Instructor Email	Course Capacity
CSE	Computer Engineering	Melih GUNAY	melihgunay	CSE204	Database	A	Joseph LEDET	josephledet	50
CSE	Computer Engineering	Murat AK	muratak	CSE204	Database	A	Joseph LEDET	josephledet	50
CSE	Computer Engineering	Joseph LEDET	josephledet	CSE204	Database	A	Joseph LEDET	josephledet	50
CSE	Computer Engineering	Melih GUNAY	melihgunay	CSE102	Intro to Java II	A	Murat AK	muratak	60
CSE	Computer Engineering	Murat AK	muratak	CSE102	Intro to Java II	A	Murat AK	muratak	60
CSE	Computer Engineering	Joseph LEDET	josephledet	CSE102	Intro to Java II	A	Murat AK	muratak	60
CSE	Computer Engineering	Melih GUNAY	melihgunay	CSE102	Intro to Java II	B	Joseph LEDET	josephledet	60
CSE	Computer Engineering	Murat AK	muratak	CSE102	Intro to Java II	B	Joseph LEDET	josephledet	60
CSE	Computer Engineering	Joseph LEDET	josephledet	CSE102	Intro to Java II	B	Joseph LEDET	josephledet	60
MAT	Mathematics	Al CIBRA	alcibra	MAT214	Differential Equations	A	Al CIBRA	alcibra	100

S3 Make Tables Not War (20 points)

Write the necessary SQL to perform the following:

1. Make a table called **Assignment** with the following columns and requirements:
 - a. **AssignmentID** - PK, Integer
 - b. **CourseID** - FK to the table you created that has Course ID as a PK, character string of 7 characters, Department abbreviation and course number
 - c. **Title** - variable character string of 20 characters
 - d. The combination of **CourseID** and **Title** must be distinct for different rows.

2. Make a table called **Question** with the following columns and requirements:
 - a. **AssignmentID** - PK, FK to Assignment table
 - b. **Num** - PK, Integer
 - c. **Text** - variable character string of 255 characters
 - d. **Points** - Integer

3. Add a column to the **Assignment** table to have the total number of points for the assignment; the default value for this field should be 0 (do not populate this field, yet).

S4 E-R, but without Clooney (20 points)

Using the tables **you produced** in Q2 and the tables defined in Q3, draw the E-R diagram. Include in your diagram each of the relations (entities) and the relationship along with participation/cardinality (i.e. 1..*, 0..1, etc.).

S5 SQL With Delight (20 points)

Using the tables **you produced** in Q2 and the tables defined in Q3, write SQL queries to perform the following (**choose 5 of these to answer**):

1. Identify the unique course IDs, course names, sections, and instructors that have assignments in our database.
2. Give a list of course IDs, assignments, and number of questions for any assignments with at least 5 questions.
3. Remove all assignments for courses in the “HIST” department. (NOTE: if you did not define the action for Referential Integrity in Q3, you will need to also do something with the Question table).
4. Add a new instructor to the “PHYS” department with the name “Ken ETTIK”. Also assign him as the instructor to an existing course - “PHYS203” section A.
5. Change the data in the Assignment table to set the total number of points for each assignment in the column you created in Q3.3.
6. Create a new assignment for “CSE204” called “Assignment01”
7. Create new questions for the “CSE204” – “Assignment01” and make them the same as the questions for “CSE102” – “Project01” (i.e. copy the same num, text, and points).
8. Make a view called AllAssignments that will have the Department Name, Course ID, Assignment Title, and total number of questions for all assignments.
9. Make a view called CSE204AssignmentQuestions that will have the Assignment Title, Question Text, and Question Points for all assignments in course “CSE204”.
10. Remove the view AllAssignments from the database.