

Birzeit University  
Department of Computer Science  
DataBase Systems, Comp 333

Final Exam

Date : Thur 22-Feb-2019

**Student ID:**

**Name:**

**Sec:**

**Q1) Briefly explain the following concepts with a clear example for each.**

- a) Views
- b) Transactions
- c) Triggers

Q2) Consider the relation R which has attributes that hold schedules of courses and sections at the university

R = ( CourseNo, SecNo, OfferingDept, CreditHours, CourseLevel, instructorSSN, Semester, Year, Days\_hours, RoomNo, No Of students).

Suppose the following FDs hold on R :

CourseNo  $\rightarrow$  OfferingDept, CreditHours, CourseLevel

CourseNo, SecNo, Year  $\rightarrow$  Days\_hours, RoomNo, No Of Students, InstructorSSN

RoomNo, Days\_hours, semester, Year  $\rightarrow$  InstructorSSN, CourseNo, SecNo

Try to normalize R so that resulting relations are in 3NF

Q3) Assume you are doing a database application for a medical laboratory. The system has the following specifications:

- 1- The Lab consists of different sections each with a list of tests such as Hematology, Microbiology etc.
- 1- Examples of tests (Blood tests, Urine tests, etc). Each test has a charge price and should belong to a section.
- 2- When a patient visits the Lab, a sample is taken and tests to be made are identified. The sample could be used for more than one test, but for each visit a new sample is required.
- 3- The patient visit should be recorded in the database.

a) Identify entities and relationships

Q3) b) Draw ER diagram.

Q4) Consider the following database schema :

Library (BranchId, BranchName, Address)

Book (BookID, title, publisherName)

Publisher (Name, address, phone)

Book\_copies (BookID, branchId, NoOfCopies)

Book\_authors (BookId, AuthorName)

Book\_loans (Book\_id, BranchId, CardNo, DateOut, DueDate)

Borrower (CardNo, Name, Address, phone)

Write SQL statements to find the following :

a) How many copies of book titled "The Lost Tribe" are owned by the library branch whose name is "Al-manara"

b) How many copies of the book titled "The lost Tribe" owned by each library branch.

c) Retrieve the names of all borrowers who do not have any books checked out.

d) For each book that is loaned out from "Al-Manara" branch and whose due date is today, retrieve the book title, the borrower's name and the borrower's address

e) For each branch , retrieve the branch name and the total number of books loaned out from that branch.

f) Delay the due date of all books in "Al-Manara" branch by 5 days.

g) Assume that we would like to create a new relation Late\_Borrowers to hold information about borrowers who have`nt yet returned due books.

Late\_Borrowers (CardNo, Name, address.phone, DueDate)

Write an SQL statement to copy these information into the above relation.