National School of Business Management

Database Management Systems
CS105.3 - 16.2 Examination - Sample

Answer either Parts A and B OR **Time: 03Hrs**
Parts A and C **Date: 2017**

Part A: Answer all Questions (All students need to answer this part)

Question 1 – 25 Marks

(a) Explain the approach, steps you take in designing a database. [5 Marks]
(b) Define what is meant by a relational database. [5 Marks]
(c) Compare the differences in database and file based approaches. [5 Marks]
(d) What is meant by "SQL is a 4GL" ? [5 Marks]
(e) Define a Functional Dependency and explain their use in DB design. [5 Marks]

Question 2 - 25 Marks

You are required to design a DB for the scenario given below.

Scenario : Online Order Processing System

A merchandiser maintains a catalog of products online. Customers can browse through the catalog and place orders for the items. Website needs customers to be registered before placing any orders. Submitted orders are processed daily which involves updating the merchandiser's items inventory and raising the invoices for the customers. Once the customers make the payments, shipment details (delivery notes) are generated. Successful delivery of goods updates the shipment details and completes the transaction.

Incase ordered items (Customer orders) are not available in the inventory, merchandiser raises a back order (Supplier order) for its registered set of suppliers to get down the unavailable items to merchandizer warehouse. Payments are settled for the registered suppliers on a monthly basis for the goods they supplied during the month. Once the goods are received from the suppliers, customer order processing proceeds as explained before.

Draw an ER diagram to accommodate all data requirement for the above scenario. Document any assumptions you make. You will assume sensible attributes and entities as necessary. [25 Marks]

PART B: Answer all Questions (Answer part B **OR** Part C - only one part)

Question 3 - 25 Marks

a) Map your database design in Question 2 to the relational model. [10 marks]
b) Validate your relational database resulted in part Q3 (a) above using normalization. Clearly indicate steps and reasons for your conclusions. [15 Marks]

Question 4 - 25 Marks

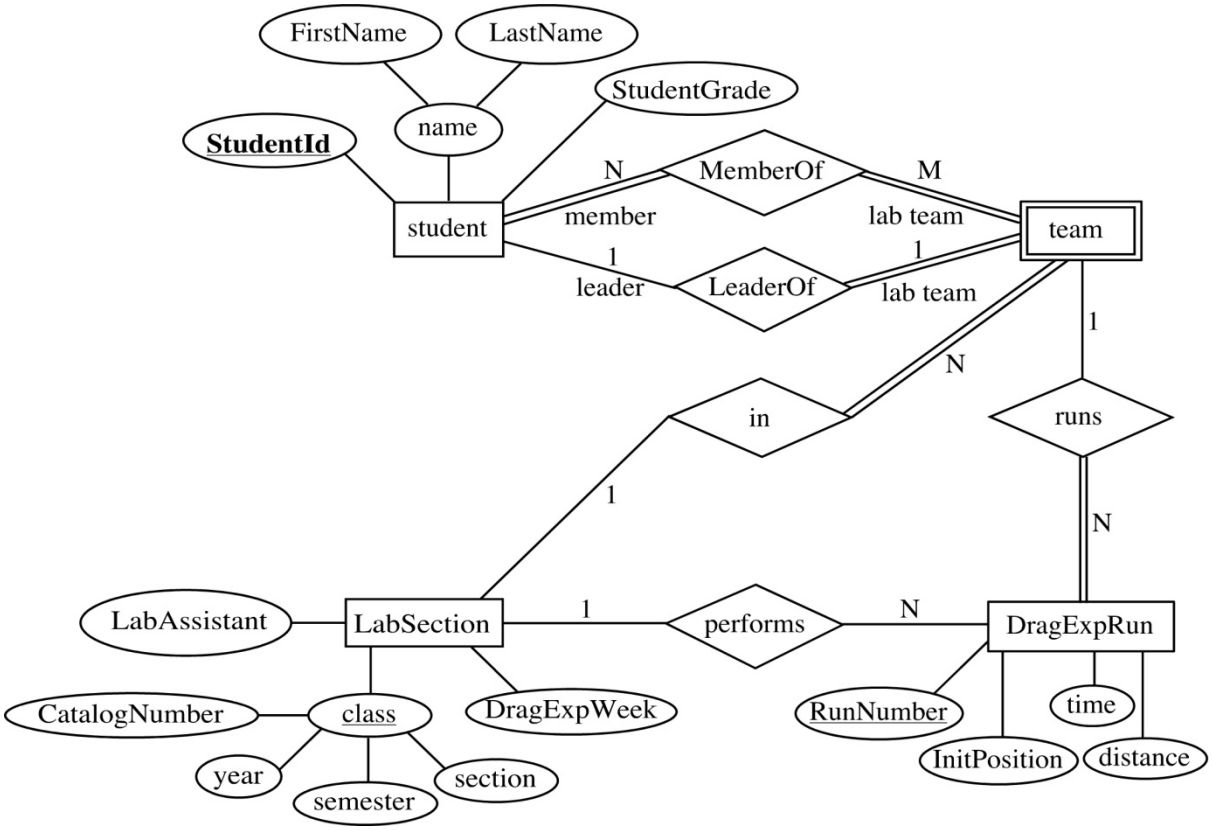
Write down SQL statements to carry out the following tasks for the resultant database in Question 3(b)

a) Create a table specifying the primary key and at least one foreign key. [3 Marks]
b) Query to list down all the items in the catalog. [3 Marks]
c) Query to list down the **details of the items** that has been orders during the last 3 months. [3 Marks]
d) Query to list down the items that has **not been orders** during the last 3 months. [3 Marks]
e) Daily report to list down the item details of customer orders placed during the day. [3 Mark]
f) Query to list down all items in the pending (not processed yet) customer orders but not available in the stores. [2 Mark]
g) Query to update the Customer Order 'CO0012' to increase the item quantity of 'IT004' to 16. [3 Marks]
h) Write down the SQLs required to enter a new customer order (first insert the header record and then insert the item detail records). [3 Marks]
i) Write SQLS to delete the Customer order 'CO0023'. [2 Marks]

PART C: Answer all Questions (Answer only part B **OR** Part C - not both)

Question 5 - 25 Marks

a) Map the following ER Model into a relational model. [10 marks]



b) Validate your relational database resulted in part Q5 (a) above using normalization. Clearly indicate steps and reasons for your conclusions. [15 Marks]

Question 6 - 25 Marks

Study the DB given below.

- Branch (bno, street, area, city, pcode, tel_no, fax_no)
- Staff (sno, fname, lname, address, tel_no, position, sex, dob, NIN, bno)
- Property_for_rent (pno, street, area, city, pcode, type, rooms, rent, ono, sno, bno)
- Renter (rno, fname, lname, address, tel_no, pref_type, max_rent, bno)
- Owner (ono, fname, lname, address, tel_no)
- Viewing (rno, pno, date, comment)

Write down SQL statements to carry out the tasks given below.

(a) Create one table above specifying the primary key and at least one foreign key. [3 Marks]

(b) List down all the properties available for renting. [3 Marks]

(c) List down the details of the properties that has not been viewed by a customer during the last 3 months. [3 Marks]

(d) List down the staff who are looking after more than 5 properties. [3 Marks]

(e) List down the properties registered under the 'Kandy' branch. [3 Mark]

(f) Update rent of all properties by 10%. [2 Mark]

(g) Query to update the owner address of ‘O0012’. [3 Marks]

(h) Insert a new property record in to your DB. [3 Marks]

(i) Delete the property ‘P0023’ from the properties_for_rent table. [2 Marks]