National School of Business Management

Database Management Systems
BMIS105 - 15.2

Time: 03Hrs

Answer all Questions **Date:**

Question 1 – 25 Marks

(a) What is a data model? Explain the difference between Conceptual, logical and physical data modelling giving examples.

[6 Marks]

(b) Discuss the importance of the relational model.

[3 Marks]

(c) What are the different aspects of relational integrity

[8 Marks]

(d) Demonstrate, giving sample SQL statements, how each of the above forms of relational integrity in part (c) can be implemented using SQL.

[8 Marks]

Question 2 - 25 Marks

Online order processing system

A merchandiser maintains a catalog of products online. Customers can browse throw 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. In addition to the above requirements your solution should also support the queries in Q4.

[25 Marks]

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 (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 database in Question 3(b)

a) List down all the details of all items in the catalog. [2 Marks]
b) List down items that has been orders during the last 3 months. [2 Marks]
c) List down the **details of the items** that has been orders during the last 3 months. [2 Marks]
d) List down the items that has **not been orders** during the last 3 months. [2 Marks]
e) List down the item details of customer orders placed today. [2 Marks]
f) List down all items in the catalog but not available in the stores. [2 Marks]
g) List down all items in the pending (not processed yet) customer orders but not available in the stores. [2 Marks]
h) Update the Customer Order 'CO0012' to increase the item quantity of 'IT004' to 16. [2 Marks]
i) Write down the SQLs required to enter a new customer order (first insert the header record and then insert the item detail records). [5 Marks]
j) Write SQLS to delete the Customer order 'CO0023'. [4 Marks]