National School of Business Management

Database Management Systems
BMIS105 - 15.1 PLY

Time: 03Hrs

Answer all Questions **Date:**

Question 1 – 25 Marks

(a) What is a data model? Why do we use both ER Model and relational model in designing a database? Explain. [6 Marks]

(b) Discuss the properties of a relation and comment why these properties are important. [4 Marks]

(c) Explain five versatile features of a DBMS. [5 Marks]

(d) What do you understand by top-down and bottom-up approaches for DB design. Explain giving examples. [5 Marks]

(e) Demonstrate, giving sample SQL statements, how relational integrity can be implemented in SQL92. [5 Marks]

Question 2 - 25 Marks

Pizza Hut – Sri Lanka

You are required to design a DB for Pizza Hut, Sri Lanka to support the following business activities.

a) Maintain details of the range of products (Cheesy onion, Chicken Bacon etc). Products belong to different product categories (Pizza, Pasta, Beverages etc) and subcategories (Classic, Signature, Favorite etc). Products also come in many sizes (Small, Medium, Large etc).

b) Products can be upgraded/customized by adding one or more other features such as different Crusts (Sausage, Cheesy Blaster, Pan etc), Toppings (Extra Cheese, Onion, Chicken etc).

c) Provisions should be made in your DB for future upgrade types other than Crusts and Toppings given in part (b) above.

d) Each Product has a price tag and each upgrade option also has a price tag.

e) Promotions are offered time to time which is a combination of products (with or without upgrades) at a reduced price with a certain duration of validity and customers can order by promotion code.

f) DB should support both online and counter orders from many outlets island wide.

g) Online orders might be picked-up from an outlet or a delivery.
h) DB also keep customer details (name, phone, email and address).
i) DB also stores sales people details, delivery people details and delivery details.

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 Products. [2 Marks]
b) Print a Pizza Hut Menu including basic products and prices. [2 Marks]
c) Print a supplementary for the above menu to include upgrade options and their prices. [2 Marks]
d) List down the products that has not been orders during the last 3 months. [2 Marks]
e) List down customer details who have placed more than 10 orders during the last 2 months. [2 Marks]
f) Print a list of total sales during the last month by main product categories. [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 upgrade product ‘P004’ by Option ‘UO002’. [2 Marks]
i) Write down the SQLs required to enter a new customer order (first insert the header record and then insert the item/product detail records). [5 Marks]
j) Write SQLS to delete the Customer order ‘CO0023’. [4 Marks]