Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

V SEMESTER B.TECH. (MECHATRONICS ENGINEERING)

END SEMESTER EXAMINATIONS, NOV 2017

SUBJECT: DATABASE MANAGEMENT SYSTEMS [MTE 4011]

REVISED CREDIT SYSTEM
(27/11/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** questions.
- Data not provided may be suitably assumed

1A.	Describe the process of designing a database with the aid of suitable diagrams.	**04**
1B.	Draw an ER diagram for the following process: Customers visit the Centage website to purchase gardening items. Customers may or may not place orders at any one time. Each order is assigned a unique order code and an order may have multiple items. One order can have multiple transactions since customers may add items, change the quantity of items or even return items after purchase, if they so desire. Relevant customer information includes name, address and telephone number.	**06**
2A.	Observe the database structure shown in Figure 2A and write SQL queries for the following: i. List all the suppliers in alphabetical order. ii. List the number of customers in each country. Only include countries with 10 or more customers. iii. List the customers in Sweden. iv. Get details of the customer named 'Thomas Cook'. v. List all the products with names that start with 'Ca'.	**05**
2B.	The ability to monitor the progress of students' academic performance is a critical issue to the academic community of higher learning. Describe how the K-means clustering algorithm can be applied for the prediction of students' academic performance in a test. Use imaginary data to support your answer.	**05**
3A.	Elaborate on the ACID properties of transactions with suitable examples.	**05**
3B.	For the set of transactions shown in Figure 3B, find the most frequent items set with a minimum support of 2, using the Apriori algorithm.	**05**
4A.	Explain about the types of attributes which are found in an ER diagram. Use suitable examples to support your answer.	**04**

4B.	Define Support and Confidence in relation to Association rules mining. For the database with transactions shown in Figure 4B, find the Confidence({5}=>{8})	**06**
5A.	i. Break down the table shown in Figure 5 A into Second Normal form ii. Differentiate between Third Normal form and Boyce Codd Normal Form.	**05**
5B.	Describe the concept of Conflict serializability of transactions with a suitable example.	**05**

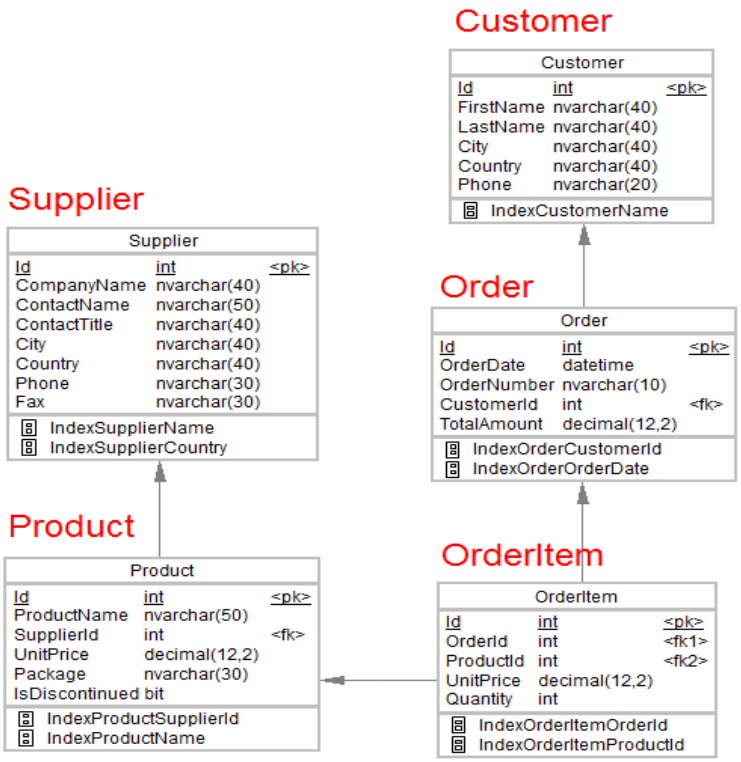

Figure 2 A

Transactions	Items
T1	Apples, Bananas, Carrots
T2	Apples, Carrots
T3	Apples, Dates
T4	Bananas, Eggs, Fish

Figure 3 B

Customer number	Items purchased
1	3, 5, 8
2	2, 6, 8
3	1, 4, 7, 10
4	3, 8, 10
5	2, 5, 8
6	1, 5, 6
7	4, 5, 6, 8
8	2, 3, 4
9	1, 5, 7, 8
10	3, 8, 9, 10

Figure 4B

Customer ID	Store ID	Purchase Location
1	1	Los Angeles
1	3	San Francisco
2	1	Los Angeles
3	2	New York
4	3	San Francisco

Figure 5 A