MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2015/2016

SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER TECHNOLOGY

MAIN CAMPUS

CCT 211: DATABASE SYSTEMS

Date: 6th January, 2016 Time: 8.30 - 10.30am

INSTRUCTIONS:

- **Answer ALL Questions in section A and any other TWO in section B**
- **Write your registration number on all sheets of the answer book used.**
- **Use a new page for every question attempted and indicate number on the space provided on the page of the answer sheet**
- **Fasten together all loose answer sheets used.**
- **No mobile phones in the examination room.**

SECTION A: ANSWER ALL QUESTIONS

Question one (30 marks)

a) State and briefly explain any four advantages of a Distributed Database Management System (DDBMS) **(6 marks)**

b) Identify and explain four important properties of a transaction that the DBMS must provide **(8 marks)**

c) State and briefly explain any four reasons for using Database management system (DBMS) in preference to file system **(8 marks)**

d) Use a relevant E-R diagram to explain a ternary relationship in a relational database model **(4 marks)**

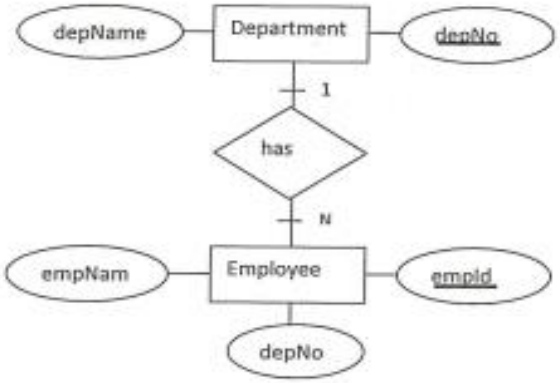
e) Choose a key and write the dependencies for the following GRADES relation:
GRADES (Student_ID, CourseNumber, SemesterNumber, Grade) **(4 marks)**

SECTION B: ANSWER ANY TWO QUESTIONS

Question Two (20 marks)

a) Use relevant diagram to describe the different levels of abstraction in a DBMS **(12 marks)**

b) Study the E-R diagram below then answer the following questions



i) Explain the meaning of the relationship as depicted in the diagram **(2 marks)**

ii) Translate the diagram into the equivalent SQL statements **(6 marks)**

Question Three (20 marks)

a) Describe the term Normalization as used in database development **(2 marks)**

b) Enumerate the steps involved in the *Normalization Process* for a given relation **(4 marks)**

c) Given the following relation and example data:

List the functional dependencies and Normalize this relation into BCNF. **(14 marks)**

PartNumber	Description	Supplier	SupplierAddress	Price
10010	20 TB Disk	Seagate	Cuppertino, CA	$100
10010	20 TB Disk	IBM	Armonk, NY	$90
10220	256 GB RAM card	Kensington	San Mateo, CA	$220
10220	256 GB RAM card	IBM	Armonk, NY	$290
10220	256 GB RAM card	Sun Microsystems	Palo Alto, CA	$310
10440	21" LCD Monitor	IBM	Armonk, NY	$2,100

Question Four (20 marks)

a) Explain the meaning of the following terms/phrases as applied in distributed databases

i) Distributed database system **(2 marks)**

ii) Transparent **(1 marks)**

iii) Location independence **(1 marks)**

b) Use a suitable block diagram to explain the components of a Distributed Database Management System **(10 marks)**

c) Explain any three strategies that can be used to allocate data in a Distributed database system **(6 marks)**

Question Five (20 Marks)

a) Use the Product table below to answer the questions that follow:

Product

ProductId	Name	SupplierId	Quantity	UnitPrice	DateOrdered
1001	Unga 2kg	Swan Millers	150	85	2/5/2015
1002	Mumias sugar 1kg	Mumias Sugar	200	120	7/5/2015
1003	Soda 500ml	Equator Bottlers	240	35	12/5/2015
1004	Kimbo 2kg	E.A. Industries	80	220	12/5/2015
1005	Panga soap	Amalo ltd	100	100	15/5/2015
1006	Salt 1kg	Jambo Traders	95	30	18/5/2015
1007	Kapa oil 10ltr	Kapa Industries	20	1000	20/5/2015
1008	Queen cake	Kano Women	400	10	25/5/2015

i) Write an SQL code to create the structure of the above table **(8 marks)**

ii) Write an SQL code to display the above table **(2 marks)**

iii) Write an SQL code to add a product to the above table **(2 marks)**

iv) Write an SQL code to add a column called **"DateSupplied"** to the above table **(2 marks)**

v) Write an SQL code to adjust the unit price of Kapa oil 10ltr to 1050 **(2 marks)**

b) Use appropriate SQL statements to explain the functions of the two main languages constituting SQL **(4marks)**