THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

(A Centre of Excellence)

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY
DIPLOMA IN INFORMATION TECHNOLGY
(DICT/DIT JAN 12/S-EV)

ECT 2201/EIT 2202: DATABASE MANAGEMENT SYSTEMS

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2012
TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*

This paper consist of **FIVE** questions

Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (Compulsory)

a) Explain the following terms:
- **i)** Database
- **ii)** DBMS
- **iii)** Physical Data Independence
- **iv)** Logical Data Independence
- **v)** Candidate Key
- **vi)** Entity
- **vii)** Attribute
- **viii)** Relationship **(16 marks)**

b) Define the following integrity constraints:
- (i) Entity Integrity
- **(ii)** Referential Integrity **(4 marks)**

Question Two

a) Explain the following database organization approaches:
- **(i)** Distributed
- **(ii)** Centralized
- **(iii)** Client/server **(9 marks)**

b) Describe the **THREE** levels of Database architecture. **(9 marks)**

c) List one binary and one unary relation algebra operation. **(2 marks)**

Question Three

a) Register is a relation holding details about studying and subjects for the semester. A possible instance of this relation is shown below. Use the relation to answer the following:

Student #	**Course #**	**Student-Name**	**Address**	**Course-Name**
S001	C 252	Alex	Mombasa	Database
S002	C 252	Kariuki	Malindi	Database
S001	C 231	Alex	Mombasa	C++
S004	C 252	Jenifer	Mombasa	Database
S001	C 321	Alex	Mombasa	Java
S002	C 403	Kariuki	Mombasa	G

- **(i)** Identity the primary key
- **(ii)** Identity function dependencies
- **(iii)** Using the relation register as an example, explain insertion, deletion and update anomalies.
- **(iv)** Describe and illustrate the process of normalizing the relation register to 3NF relations. Identify the primary and foreign keys in your 3NF relations. **(20 marks)**

Question Four

a) Describe the following Database models:
- **(i)** Relational
- **(ii)** Hierarchical

(iii) Network
(iv) Object Oriented **(8 marks)**

b) State FOUR functions of Database Administrator (DBA) **(4 marks)**

c) Using examples, explain the following relational operations:
(i) Selection
(ii) Projection
(iii) Product
(iv) Unior
(v) Intersection **(8 marks)**

Question Five

a) The table below show a possible instance of relation staff'

Sno	Sex	Fname	Lname	City	Position	Salary
SL 21	M	Joh	Kamau	Malindi	Manager	50,000
SG 37	F	Alice	Owino	Mombasa	Snr Assistant	45,000
SG 14	M	Joseph	Kariuki	Malindi	Assistant	36,000
SA 9	F	Mary	Owour	Mombasa	Clerk	28,000
SL 41	M	Juma	Ali	Mombasa	Clerk	28,700
SG 5	F	July	Kariuki	Malindi	Assistant	40,000

Use SQL statements to:
(i) List the names all manager earning more than 25,000
(ii) List the staff who work in Mombasa
(iii) List names of female staff earning more than 30,000
(iv) Count number of male and female staff
(v) Insert record of new staff whose details are: SL 43, F, Mary, Owino, Mombasa.
(16 marks)

b) Define the following:
(i) Tuples
(ii) Schema **(4 marks)**