

**KIBABII UNIVERSITY**

**UNIVERSITY EXAMINATIONS  
2018/2019 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS  
YEAR TWO SEMESTER TWO EXAMINATIONS**

**FOR THE DEGREE IN  
INFORMATION TECHNOLOGY**

**COURSE CODE : BIT 227  
COURSE TITLE : DATABASE SYSTEM DESIGN  
AND DEVELOPMENT**

**DATE: 23/05/2019**

**TIME: 2.00P.M. – 4.00P.M.**

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**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTIONS ONE AND ANY OTHER TWO.**

**Question one (Compulsory) (30 Marks)**

- a. In terms of the relational model, describe the following give examples:- [6 Marks]
- Data Definition
  - Data Manipulation
  - Candidate key
- b. List and explain four phases carried out during the development of a database system [8 Marks]
- c. Explain why the word 'DISTINCT' may be included in an SQL statement, such as SELECT DISTINCT Name. [2 Marks]
- d. What is data model? Explain any three components of a data model. [5 Marks]
- e. Given the products table below;

Product_id	Product_name	Quantity	Price
001	Book	50	75
002	Pen	100	20
003	Rubber	200	20

Write MySQL statements do the following:

- Create the product table and insert the records. [3 Marks]
- Retrieve product\_id, product\_name and quantity from the product table. [2 Marks]
- Update product table so that the book quantity is 40. [2 Marks]
- Add another column called order\_id to the product table. [2 Marks]

**Question Two (20 Marks)**

- a. Compare and contrast; [4 Marks]
- A data dictionary and a system catalogue
  - An entity instance and an entity occurrence
- b. Discuss three maintenance problem associated with un-normalized data- sets. [6 Marks]
- c. Describe five disadvantages of using database systems (10 marks)

**Question Three (20 Marks)**

a. Consider the following:

Employee (employee\_id, employee\_name, city, department, date\_of\_birth)

Customer (customer\_id, customer\_name, city)

Company (company\_name, company\_code, city)

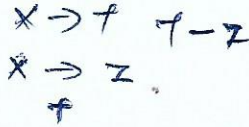
Write Mysql statements you will use to;

- Create the employee, customer and company table. [6 Marks]
  - Insert a record in the employee table. [2 Marks]
  - Display all records in the employee table. [2 Marks]
- b. Describe the three normal forms. [4 Marks]
- c. Explain three properties of relations in database systems [6 Marks]

**Question Four (20 Marks)**

- a. Outline the symbols used in entity relationship diagram. [5 Marks]
- b. Using example explain the following terms as used in database systems [4 Marks]
- Partial dependency

ii. Transitive dependency



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c. What is normalization?

[1 Mark]

d. Briefly explain the characteristics of a normalized table

[4 Marks]

e. Describe the process of normalization, up to and including the third normal form.

[6 Marks]

**Question Five (20 Marks)**

a. What is a Data dictionary? List any three contents of a data dictionary

[4 marks]

CustID (PK)	Last name	First name	Phone	City	Regions	Overdue status	Preferred	Income	Numorders	Balance	Birth date
10	Smith	Bob	123-4567	Orlando	North	Paid	Y	10000	5	100	1/1/1978
12	Ramirez	Jose	422-1234	Apex	South	Paid	Y	50000	16	600	2/8/1970
13	Washington	Terrell	951-1234	Sujour	East	(null)	Y	20000	25	700	3/5/1985
15	Jones	Bill	963-7894	Axcrossing	West	Unpaid	Y	16900	2	500	12/1/1990
17	Morales	Sandy	951-1234	Orlando	North	Paid	N	85000	90	400	8/3/1986
21	Principe	Michelle	963-4561	Apex	South	Paid	N	94000	85	300	7/2/1974
23	Mavis	John	147-4561	sujour	East	unpaid	Y	25000	26	600	3/5/1989

b. As a data analyst, you have been requested to write the SQL statements to display:

i) The table as it appears above

[2 marks]

ii) The name of the city and the names of the customers in that city

[2 marks]

iii) The name of the customers whose overdue status is paid and they are preferred

[2 marks]

iv) The custID, phone and city for all customers whose balance is less than 500 or whose income is less than or equal to 60000

[2 marks]

v) The names of the regions (to appear without repetition) and displayed in descending order

[2 marks]

vi) The customer names and phone number for all customers whose overdue status is unpaid

[2 marks]

vii) The customer names, city and region in a descending order of income [2 marks]

viii) The name of the customer with highest balance [2 marks]