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**University Examinations 2014/2015**

FOURTH YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN BUSINESS INFORMATION TECHNOLOGY

AND

SECOND YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR SCIENCE IN INFORMATION TECHNOLOGY, BACHELOR OF SCIENCE IN BUSINESS INFORMATION TECHNOLOGY

AND

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

**ICS 2206: DATABASE SYSTEMS**

**DATE: DECEMBER 2014 TIME: 2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE**

1. Refer to the customer table below to answer the questions that follow;

**Customer**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 | Axecrossing | 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 |

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

1. The table as it appears above (2 marks)
2. The name of the city and the names of the customers in that city (2 marks)
3. The name of the customers whose overdue status is paid and they are preferred (2 marks)
4. 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)
5. The names of the regions (to appear without repetition) and displayed in descending order (2 marks)
6. The customer names and phone number for all customers whose overdue status is unpaid (2 marks)
7. The customer names, city and region in a descending order of income (2 marks)
8. The name of the customer with highest balance (2 marks)
9. Define the following terms as used in database systems
10. Entity integrity (2 marks)
11. Data redundancy (2 marks)
12. Serializability (2 marks)
13. Database (2 marks)
14. Explain why database design is important (6 marks)

**QUESTION TWO**

1. Discuss any four different types of database systems (8 marks)
2. “Concurrent transactions can present various problems”. Describe some of these problems and explain how they can be resolved (12 marks)

**QUESTION THREE**

1. Explain the five functional components of a database system (10 marks)
2. (i) Define the term deadlock and explain when it can occur (4 marks)

(ii) Describe any three techniques to control deadlock (6 marks)

**QUESTION FOUR**

1. Distinguish between simple and composite attributes and single valued and multi valued attribute (4 marks)
2. Describe five disadvantages of using database systems (10 marks)
3. Evaluate three causes of a transaction failure (6 marks)

**QUESTION FIVE**

1. Explain five characteristics of a relational model (10 marks)
2. Explain any five of the rules in the “Date’s 12 rules of distribution” (10 marks)