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(*University of Choice*)

**MASINDE MULIRO UNIVERSITY OF**

**SCIENCE AND TECHNOLOGY**

**(MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS**

**2015/2016 ACADEMIC YEAR**

**FOURTH YEAR FIRST SEMESTER EXAMINATIONS**

**FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE**

**COURSE CODE: CSC 461E**

# COURSE TITLE: DATABASE ADMINISTRATION AND PROGRAMMING

**DATE:**  **TIME:**

### INSTRUCTIONS TO CANDIDATES

Question ONE (1) is compulsory

Attempt any TWO (2) questions

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over.

TIME: 2 Hours

**Question One**

1. You are a DBA for a large phone company. You need to design a database integrity check job in SQL Server Agent. During a planning meeting, your manager asks you the following questions about your integrity job:
	1. In large databases, what options will you use with the *DBCC CHECKDB* statement to minimize any performance impact of running the statement? **[4 Marks]**
	2. What other options will you use when you run the DBCC CHECKDB statement against all databases?  **[4 Marks]**
	3. How can you make sure that if the integrity-check job finds an issue, you can correct the problem and ensure the database’s integrity? **[6 Marks]**
2. You are a DBA at a SQL Server hosting organization. You need to ensure that each of your organization’s client installations can operate with different service packs of SQL Server. What can you do to achieve your goals without requiring a different server for each client? **[6 Marks]**
3. With reasons what backups should you implement to ensure that you can recover data of a database of over 500GB while the company can be unavailable for 30 minutes, though the company can handle a data loss of 5 minutes?  **[10 Marks]**

**Question Two**

You are a DBA for large phone company. The company has decided to upgrade to SQL

Server 2005 and you are charged with creating and implementing the upgrade plan. During a planning meeting, your manager asks you questions about your upgrade plan. Answer the following questions for your manager.

1. Given that we are buying new servers, how will we get the databases from the old installation to the new SQL Server 2005 instance without affecting the current online availability? **[7 Marks]**
2. How can we make sure that service will not be interrupted if the upgrade process fails? **[5 Marks]**
3. How can we make sure that the current applications will not have problems once we connect them to the new installation? **[8 Marks]**

**Question Three**

You work as a senior DBA at an insurance company that has its headquarters in

Nairobi and branch offices in Mombasa, Nakuru, Kisumu, and kakamega. Your company has an Enterprise Resource Planning (ERP) solution installed on an Oracle server, and you are deploying a call-center application based on SQL Server 2005. The call- center application on SQL Server 2005 needs access to the Oracle server to extract information. Also, you need to send aggregate information to branch offices by e-mail, but you have a UNIX mail server.

1. How should you provide access to the Oracle server from SQL Server 2005? **[4 Marks]**
2. What security solution should you implement to ensure that your connection is as safe as possible? **[4 Marks]**
3. What infrastructure changes are needed to support Database Mail? **[8 Marks]**
4. Multiple instances would be ideal in some instances, while they also have short comings. Cite with reasons these shortcomings **[4 Marks]**

**Question Four**

Mpango wa kando Limited, a health care company located in Kakamega County, manages patient claims data. To support the business, you need to create a database to store the wide variety of data related to patient claims.

You need to create structures for basic patient data, such as name, address, date of birth, and Social Security number. The database also needs to store the companies that Mpango wa kando works with, including the company name, address, and people to con- tact. Each patient claim must be associated with a company in the database. And the database needs to associate a list of doctors with a claim and also store various supporting documents.

All pieces of data need to be uniquely identified within the tables. Referential integrity is crucial to the successful operation of the database application.

1. How would you define the table structures to meet the needs of the patient claims database? **[15 Marks]**
2. As a database administrator you are requested to write a code of a RULE that will validate the email field of cuctomer\_address table to control the fake email address. **[5 Marks]**

**Question Five**

Wakhulia Limited, a health care company located in Munchu, Kakamega County, has a volatile database containing patient claims data. The company has recently undertaken a massive development process to rewrite the entire patient claims database, currently running on Microsoft Access, in a Microsoft .NET language with the data being stored in SQL Server 2005.

The company’s developers could port the Access database and rewrite the patient claims application’s entire functionality. However, they did not have any DBAs on the staff to help with any database issues. The developers also have little knowledge about SQL Server. In development and testing, the new application performed much better than the previous application, so testing was cut short and the application was deployed into production.

At the same time as the new application was put into production, sales signed four major new customers, which increased application activity almost 30 times more than before. By the time the support staff was partially done setting up the first customer, the customer started complaining about some performance issues. And performance declined rapidly as more data was added. Management concluded that it would be impossible to get all four of the new customers running on the new application when it couldn’t even handle the load it already had. In addition, the IT staff was facing unexplained deadlock errors.

1. You have been hired by Wakhulia Limited to fix the performance issues along with all of the unexplained “deadlock victim” errors. How do you go about fixing this environment?  **[15 Marks]**
2. With the aid of examples, cite when using multiple instances has advantages over using only a single instance of SQL Server. **[5 Marks]**