**Technical Questionnaire**

Please use a red highlighter or font to provide your answer(s) below, as appropriate.

**Section 1 : RDBMS Concepts (4 Questions)**

1. **What is a relational database?**
2. Where the data has a direct relation with the problem domain.
3. Where the data is stored using implied relationships between tables.
4. Where the data has a direct relation with the database.
5. Where the data reflects the developers relations with other developers.
6. **In the context of an RDBMS, what is normalization?**
7. A process of ensuring only normal data is stored in the database.
8. A process of making the data normal once the data is entered.
9. A process of reducing redundancies of data in a database.
10. A process of reducing the data in the database.
11. **What are the most common forms of normalization?**
12. First, second and third.
13. First and second.
14. First, second, third and fourth.
15. Second and third.
16. **Which one of the following is NOT a direct benefit of normalization?**
17. Flexible database design
18. Reduction of redundant data
19. Referential integrity
20. Better organization of data

**Section 2 : Hands on Database Experience (8 Questions)**

1. **What does SQL stand for?**
2. Sequential Query Language
3. Structured Query Language
4. Sybase Query Language
5. System Queue Language
6. **If you create an index on a table (that has millions of rows of data in it), which one of the following will NOT be a result of that action?**
7. Faster data access
8. Reduction of redundant data
9. Better performance in some cases
10. No performance improvement in some cases.
11. **Which of the following best describes a clustered index?**
12. An index where the data is clustered together.
13. An index where the index information is clustered together.
14. An index where the index information is clustered according to the data.
15. An index where the physical and logical order of the data are the same.
16. **Table A has a column B, that is included in 5 different indexes. This table is updated very frequently. What will you encounter because of this scheme? (Circle All that apply)**
17. Faster access when issuing a command with column B in the join clause
18. Increased cost of maintaining the indexes when column B is updated
19. Increased performance of select/insert/delete/updates commands to the table
20. Slower access when using a select command involving column B
21. **Which of the following best describes the role of the Optimizer?**
22. Optimizing the database
23. Making optimum use of the storage space when storing the data
24. Constructing query plans based on index statistics
25. Making optimum use of all system resources.
26. **What is a stored procedure?**
27. A precompiled set of SQL commands.
28. A procedure that is stored in the database.
29. A set of commands that can accept parameters and return result sets or return codes.
30. All of the above.
31. **Consider the following schema and query…**

**CAMPUS\_CONFIG**

CC\_CAMPUS\_ID (int)

CC\_CONFIG\_REF\_ID (int)

CC\_VALUE (varchar(255))

CAMPUS\_ID (int)

CAMPUS\_CODE (varchar(4))

CAMPUS\_DESC (varchar(255))

CAMPUS\_ACTIVE (int)

**CAMPUS**

CAMPUS\_ID=CC\_CAMPUS\_ID

CONFIG\_REF\_ID (int)

CONFIG\_REF\_SECTION (varchar(30))

CONFIG\_REF\_KEY (varchar(60))

CONFIG\_REF\_COMMENT (varchar(255))

**CONFIG\_REF**

CONFIG\_REF\_ID=CC\_CONFIG\_REF\_ID

QUERY : select \*

from

campus\_config,

config\_ref,

campus

where

campus\_id=4 and

campus\_id=cc\_campus\_id

1. How many columns will this query return ? \_\_\_\_\_
2. Is there anything wrong with this query ? If so, what is it and how would you fix it ?

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**8. Your database has the following two tables:**

CUSTOMERS   
with field names (CUSTOMER\_ID, NAME, PHONE)

ORDERS   
with field names (ORDER\_ID, CUSTOMER\_ID, ORDER\_TOTAL)

CUSTOMER\_ID is the primary key for CUSTOMERS, and ORDER\_ID is the primary key for ORDERS.   
  
Which two SQL statements will return the CUSTOMER\_ID for Customers who have not placed any orders? (Choose two. Each correct answer provides a complete solution.)

A. SELECT CUSTOMERS.CUSTOMER\_ID FROM CUSTOMERS LEFT OUTER   
JOIN ORDERS ON CUSTOMERS.CUSTOMER\_ID=ORDERS.CUSTOMER\_ID   
WHERE ORDERS.ORDER\_ID IS Null

B. SELECT CUSTOMER\_ID FROM CUSTOMERS  
WHERE CUSTOMER\_ID NOT IN (SELECT CUSTOMER\_ID FROM ORDERS)

C. SELECT CUSTOMER\_ID  
FROM CUSTOMERS  
WHERE NOT EXISTS (SELECT CUSTOMER\_ID FROM ORDERS)

D. SELECT CUSTOMER\_ID  
FROM CUSTOMERS  
WHERE CUSTOMER\_ID IN (SELECT CUSTOMER\_ID FROM ORDERS)

E. SELECT CUSTOMER\_ID FROM CUSTOMERS WHERE  
CUSTOMER\_ID NOT IN (  
SELECT CUSTOMER\_ID FROM ORDERS WHERE ORDER\_ID IS Null)

**Section 3 : OOD Concepts (5 Questions)**

**1. Which one of the following best describes the principle of Object Oriented Development?**

1. The problem domain is defined in terms of objects and their interactions
2. The problem domain is defined in terms of unique objects that don’t require interactions with others.
3. The development process is oriented towards objects.
4. None of the above.
5. Which one of the following doesn't apply directly to OOD?
6. ERD
7. UML
8. XML
9. Use cases
10. **Object A is inherited from Object B. Which of the following is FALSE (circle all that apply)?**
11. Object A inherits all of Object B's properties and methods.
12. Object A can modify some of its inherited properties and methods
13. Object A can extend some of its inherited methods
14. Object A can access all its inherited properties

**3. What is polymorphism?**

1. The process of morphing an object into polymer.
2. The concept of using multiple forms of the same object
3. The concept of using multiple objects that can morph into other objects
4. The concept of using an object that can morph into other objects

**4. In C#, private properties of a base class are only accessible to classes inherited from it.**

1. True
2. False

**5. In C#, what is a virtual method?**

1. A method that doesn't have an implementation.
2. A method that may or may not have an implementation.
3. A method that doesn't exist.
4. A method that hasn't been coded yet.

**Section 4 : .NET Coding Techniques and Concepts (4 Questions)**

**1. A Windows Forms application uses a stored procedure to display records from a SQL Database in a List Box control. Users of the form do not make any changes to the data. You want to limit the overhead of the application. Which of the following should you use to display the data on the Windows form?**

A. DataSet

B. SQLDataAdapter

C. ExecuteScalar

D. ExecuteReader

**2. You are developing an ASP.NET Web application that reads data from a database. You want to store data for the connection string your application will use to connect to the database in the Web.config file. In which of the following Web.config sections should you store this data?**

A. <appSettings>

B. <authentication>

C. <identity>

D. <sessionState>

**3. You are part of a team that is using Visual Studio .NET to develop a Web application. You are looking through the files in the application, and you see the following files:**  
createmembership.aspx   
createmembership.aspx.cs  
  
Which two of the following statements most accurately describe these two files? (Select two.)

A. The createmembership.aspx.cs file is a Web form, which displays a user interface to the user.

B. The createmembership.aspx file is a code file, which contains code that interacts with the user interface in the Web form.

C. The createmembership.aspx file is a Web form, which displays a user interface to the user.

D. The createmembership.aspx.cs file is a code file, which contains code that interacts with the user interface in the Web form.

E. The createmembership.aspx.cs file is the compiled version of createmembership.aspx.

F. The createmembership.aspx file is an uncompiled file that will become createmembership.aspx.cs when it is compiled.

**4. You are using Visual Studio .NET to develop a Web application for a large video rental store. The titles, as well as other information about the store's videotapes, laser disks, DVDs, and audio books, are stored in a SQL Server 2000 database.**  
The store wants to allow visitors to its Web site to browse the list of titles sorted in various ways, such as by medium (VHS, DVD, etc.), genre, director, and so on. You have created a number of stored procedures to facilitate the different ways of presenting the data.   
  
Given an existing dataset named dsVids and a connection named conn, which of the following code examples illustrates the correct way to call the stored procedure that returns the list of DVD titles, ListDVDTitles?

A. SqlDataAdapterdaDVDList = new SqlDataAdapter();  
daDVDList.SelectCommand = newStoredProcedure();  
daDVDList.SelectCommand.Connection = conn;  
daDVDList.SelectCommand.CommandText = "ListDVDTitles";  
daDVDList.SelectCommand.CommandType = CommandType.SQLCommand;  
daDVDList.Fill(dsVids, "Titles");

B. SqlDataAdapterdaDVDList = new SqlDataAdapter();

daDVDList.SelectCommand = new SqlCommand();

daDVDList.SelectCommand.Connection = conn;

daDVDList.SelectCommand.CommandText = "ListDVDTitles";

daDVDList.SelectCommand.CommandType = CommandType.StoredProcedure;

daDVDList.Fill(dsVids, "Titles");

C. SqlDataAdapterdaDVDList = new SqlDataAdapter();  
daDVDList.SelectCommand = new SqlCommand();  
daDVDList.SelectCommand.Connection = "ListDVDTitles";  
daDVDList.SelectCommand.CommandType = CommandType.StoredProcedure;  
daDVDList.Fill(dsVids, "Titles");

D. SqlDataAdapterdaDVDList = new SqlDataAdapter();  
daDVDList.SelectCommand = new SqlCommand();  
daDVDList.SelectCommand.CommandText = "ListDVDTitles";  
daDVDList.SelectCommand.CommandType = CommandType.StoredProcedure;  
daDVDList.Fill(dsVids, "Titles");

**Section 5 : Simple Code Writing (4 Questions)**

1. **The following is a two-dimensional array of integers. Each element of the array is the product of its value along the x and y axis. For instance, the element at position (1,1) is 1x1=1, the element at position (3,2) is 3x2=6.**

x

|  |  |  |
| --- | --- | --- |
| (x,y)=(1,1)1  y | (2,1)  2 | (3,1)  3 |
| (1,2)  2 | (2,2)  4 | (3,2)  6 |
| (1,3)  3 | (2,3)  6 | (3,3)  9 |

Using ANY language of your choice (i.e. Java, C++, C#, Visual Basic, etc. , but DO NOT invent your own), write a procedure that will declare a two-dimensional array of integers of size 4x4, and populate it with the appropriate values according to the rule stated above. Indicate what language you're using.

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1. **If you don't know what recursion is, skip this question. If you do know what it is, complete the following procedure USING RECURSION. This procedure calculates the factorial for a given number. (i.e. factorial 3 is 1x2x3=6, factorial of 5 is 1x2x3x4x5=120)**

int factorial(int argument) {

if (argument<=0)

return 0;

else {

if (argument==1)

…

}  
}

1. **Consider the following piece of code written in an invented hybrid language. Assume that this code compiles and works. Assume that all operators and keywords work the same way as they would in other languages.**

int data[25] // this array is 1 based

// initialize array here

// code deleted

// end initialization

int x=0

inti,j,k

int temp

for i=1 to 25

x=0

for j=i to 25

if data[j]>x then

x=data[j]

k=j

end if

next j

temp=data[i]

data[i]=data[k]

data[k]=temp

next i

What is this code doing?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Refer to the code in the previous question. There's one particular scenario where this code will not work. What is that scenario, and what would you do to fix it?**