



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2004/2005 – 2nd Year Examination – Semester 4

IT4302 -Rapid Application Development
PART 2 - Structured Question Paper with Model Answers

14th August, 2005
(ONE HOUR)

To be completed by the candidate

BIT Examination Index No: _____

Important Instructions:

- The duration of the paper is **1 (One) hour**.
- The medium of instruction and questions is English.
- This paper has **3 questions** and **10 pages**.
- **Answer question 1 (60% marks) and any one of the other questions (40% marks each) only.**
- **Write your answers** in English using the space provided **in this question paper**.
- Do not tear off any part of this answer book.
- Under no circumstances may this book, used or unused, be removed from the Examination Hall by a candidate.
- Note that questions appear on both sides of the paper.
If a page is not printed, please inform the supervisor immediately.

Questions Answered

Indicate by a cross (x), (e.g.) the numbers of the questions answered.

To be completed by the candidate by marking a cross (x).	1	2	3	
To be completed by the examiners:				

Based on the following case study answer question 1.

1)

InfoTech Agency

InfoTech Agency is a famous bookshop which sells technical books, CDs, tapes and videos imported directly from international publishers. It also manages a library of these items at a special 3-tiered subscription rate for its customers. Library members receive special discounts whenever they purchase any item from InfoTech Agency. Operations of the library and bookshop are integrated together.

The library is set up along conventional lines. There are restrictions on the number of items which can be borrowed depending on the level of subscription. Levels A,B and C are allowed 3,2 and 1 items respectively. Library items should be returned within seven days but they can be extended for another week if there is no reservation by another member of the library.

Library items include books, CDs, tapes and videos. They can be categorized as permanent reference items (PR) or lending items. PR items can be used inside the library but are not allowed to be borrowed. There can be more than one copy available for any item.

In order to borrow a library item or to buy, a customer selects it and takes it to the entrance counter which handles both lending and selling operations. However, there is a separate counter for the cashier. Library members have a special card with a photo of the member. The person at the counter first checks the library card for membership status. Subsequently he will check for overdue books and whether he has already reached the borrowing limit. If there is no problem, then the member can leave with his loan items and that information will be recorded. On the other hand, if a person wants to buy some items, the clerk issues an invoice to the customer and the relevant amount should be paid to the cashier before items are issued. The customer can claim a special discount if he posses a library card of the InfoTech Agency library.

When a member returns borrowed items, the clerk checks whether the items are reserved items. If so, he will take necessary steps to inform the person who has reserved it. If there is a fine to be paid due to damage or items being overdue, the member should settle it to reactivate his membership status.

By giving details of library items and the membership card to the clerk at the counter, anyone can reserve them if such item is not available in the library at the time. It is possible to have more than one reservation for a single lending item.

(a) Identify five possible classes and write down the code to create instances to three of the classes identified.

(09 marks)

<p><u>ANSWER IN THIS BOX</u></p> <p>.....</p> <p>Book, Member, Copy, Borrowed copy, Retired copy.</p> <p>.....</p> <p>Invoice, Selling Copy, etc.</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
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- (b) Write down lines of code to open a database connection, in order to implement the system given in the case study. Since MS SQL server 2000 is used as the backend, *sqlconnection* must be used. (The following are variable names: *myCon* as connection, Database is *InforTec*, *strUsername* for user name and password is *strPassword*; server name is *bitserver*.)

(12 marks)

ANSWER IN THIS BOX

```
Dim myCon as new sqlclient.sqlconnection ("provider = SQLOLEDB;" _
```

```
& "Initial catalog = InforTec;" _
```

```
& " User Id = " & strUserName _
```

```
& "; Password = " & strPassword & " ;")
```

```
myCon.Open()
```

- (c) Modify the above code to accommodate Structured Exception Handling (without using *SqlException*). While correct user names and passwords are entered, the application should allow navigating to a menu form (*frmMenu*). When Wrong passwords are entered, application must generate an error.

(15 marks)

ANSWER IN THIS BOX

```
Dim myCon as new sqlclient.sqlconnection ("provider = SQLOLEDB;" _
```

```
& "Initial catalog = InforTec;" _
```

```
& " User Id = " & strUserName _
```

```
& "; Password = " & strPassword & " ;")
```

```
Try
```

```
myCon.Open()
```

Continued...

```

Dim myform As New frmMenu

myform.Show()

Catch ex As Exception

MsgBox("Error:" & ex.Message)

End Try
    
```

- (d) Describe what SqlExceptions are and when one can use SqlExceptions. How would you replace the above code to accommodate SqlExceptions?

(12 marks)

ANSWER IN THIS BOX

This class is created whenever the .NET Framework Data Provider for SQL Server encounters an error generated from the server.

SqlException always contains at least one instance of SqlError

```

Try

myCon.Open()

Dim myform As New frmMenu

myform.Show()

Catch ex As SqlException

MsgBox("Error:" & ex.Message)

End Try
    
```

Continued...

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- (e) Define parameter queries and modify the query below to make it a parameterized query by inserting place holders and named parameters.

Select * from publishers where Au_Lname = "Stevens"

(12 marks)

ANSWER IN THIS BOX

.....

To create a query that can have different values at different times, one uses parameters in the query. A parameter is a placeholder for a value that is supplied when the query runs.

Select * from publishers where (Au_Lname = ?) or

Select * from publishers where Au_Lname = % LastName %

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- 2) (a) (i) Describe Namespace and Namepolution.
(ii) Write down and justify the importance of Namespace to prevent Namepolution

(10 marks)

<p>ANSWER IN THIS BOX</p> <p>Namespace</p> <p>Namespaces organize the objects defined in an assembly. Assemblies can contain multiple namespaces, which can in turn contain other namespaces. Namespaces prevent ambiguity and simplify references when using large groups of objects such as class libraries.</p> <p>Namepolution</p> <p>The developer of a class library is hampered by the use of similar names in another library. To prevent such similar names, Namespaces have been introduced in Visual .net</p>

- (b) Write down Namespaces for windows forms and a listbox of a form with the declaration.

(10 marks)

<p>ANSWER IN THIS BOX</p> <p>Dim myform as new Systems.Windows.Forms</p> <p>Dim myListbox as new Systems.Windows.Forms.ListBox</p>

- (c) Where should one place *Imports* statement and why is it important in Visual .net? (10 marks)

ANSWER IN THIS BOX

Imports statement must be placed before any declaration including class and modules and before any references to identifiers.

Imports statement is important since it can refer to a namespace prior to its usage. Therefore frequent long declaration of Namespaces is prevented.

- (d) Describe the following: (10 marks)
- (i) MSIL
 - (ii) CLR

ANSWER IN THIS BOX

MSIL

When compiling to managed code, the compiler translates the source code into MicroSoft Intermediate Language (MSIL), which is a CPU-independent set of instructions which can be efficiently converted to native code. MSIL includes instructions for loading, storing, initializing and calling methods on objects, as well as instructions for arithmetic and logical operations, control flow, direct memory access, exception handling and other operations.

Continued...

CLR

The common language runtime makes it easy to design components and applications whose objects interact across languages. Objects written in different languages can communicate with each other, and their behaviors can be tightly integrated.

- 3) (a) Two forms have been created: *frmMyForm* and *frmNextForm*. To the *frmMyForm*, a button has been added. Once the button is clicked, *frmNextForm* should appear after closing the *frmMyForm*. Write down the lines of code in the button click event. The background colour (backcolor) of the form should change from the default color to Red.

(12 marks)

ANSWER IN THIS BOX**Dim MyForm As New frmMyForm****MyForm.Show()****MyForm.BackColor = System.Drawing.Color.Red****Me.Hide()**

(b) Describe the following functions:

- (i) Len()
- (ii) Mid()
- (iii) Right()
- (iv) nstr()

(10 marks)

<u>ANSWER IN THIS BOX</u>	
Len()	Returns an integer containing either the number of characters in a string or the number of bytes required to store a variable.
Mid()	Returns a string containing a specified number of characters from a given position in a string.
Right()	Returns a string containing a specified number of characters from the right side of a string.
nstr()	Returns an integer specifying the starting position of the first occurrence of one string within another.

(c) Using the functions given in (b) and the declarations given below write the code to do the following:

```
Dim strX as String  
strX = "Left Right"
```

- (i) Find the position of the space.
- (ii) Find the length of the string.
- (iii) Separate Right from left.

(12 marks)

<u>ANSWER IN THIS BOX</u>	

Continued...

(i) Dim mypos as Integer

MyPos = instr(strX, " ")

(ii) Dim intLength as integer

intLength = Len(strX)

(iii) Dim mypos as Integer

dim Myleft as string

mypos = instr(strX, " ")

myLeft = Microsoft.VisualBasic.Left(strX, (Len(strX) - mypos) - 1)

- (d) (i) Declare a three dimensional Array.
(ii) Declare a jagged array with 3 nested levels.

(06 marks)

ANSWER IN THIS BOX

Dim MyArray (2,3,4) as integer

Dim MyArray () () () as byte
