



**UNIVERSITY OF COLOMBO, SRI LANKA**

**UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING**

(Successor to the Institute of Computer Technology (ICT), University of Colombo)

**DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)**

**Academic Year 2003/2004 – 2<sup>nd</sup> Year Examination – Semester 4**

***IT4201: Rapid Application Development***

***PART 2 – Structured Question Paper***

**24<sup>th</sup> July, 2004**

**(ONE AND HALF HOURS)**

**To be completed by the candidate**

BIT Examination Index No: \_\_\_\_\_

**Important Instructions:**

- The duration of the paper is  $1\frac{1}{2}$  **(one and half) hours.**
- The medium of instruction and questions is English.
- This paper has **4 questions** and **12 pages.**
- **Answer question 1 and any 2 of the other questions only.**
- All questions will carry equal marks.
- **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 (×), (e.g. 

×
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) the numbers of the questions answered.

	Question numbers			
	1	2	3	4
<b>To be completed by the candidate by marking a cross (×).</b>				
<b>To be completed by the examiners:</b>				

Based on the following case study answer question 1.

1)

### **Video library Case Study**

Atlantic Video Library specializes in obscure videos. It lends videos only to members of the video society, which is part of an exclusive and very expensive Gentlemen's club. Any member of the club automatically becomes a member of the video society. New members are admitted only on 1<sup>st</sup> January each year.

The library is set up along conventional lines, but there are no restrictions on the number of videos members may borrow at any one time. Videos have to be returned only if required by another member. Most of the active users of the library regularly change their videos. Two or three copies of popular titles are available.

In order to borrow a video, a member selects it, takes it to the issue desk and gives the video and his club membership card, to the librarian. The librarian takes the video ID card from the video sleeve and adds the membership number to the card. The librarian then places the card into the loan file and the member leaves with his video and his club membership card. This same procedure is followed in respect of each video borrowed.

When a member returns a video, he hands over the video to the librarian. The librarian finds the video card in the loans file and places the card in the video sleeve before returning the video to the library shelves not forgetting to remove the member number from the video card.

To reserve a video which is already on loan, the member gives the details of the video and the membership number to the librarian. The librarian finds the relevant video card in the loans file, and adds the member's number to the reservation column on the video card. The librarian also makes a note of the member who has the video on loan and completes a return request card addressed to the member. The address is taken from the library copy of the club membership book. When the reserved video is returned, the librarian puts the video under the counter and completes a reservation ready card addressed to the member who requested the reservation. The member requiring the video can then pick the video up from the library and have it issued in the usual manner. Members make many inquiries from the librarian. Typical questions include- "Is the video titled 'abc' on loan?", "Which videos did actor 'xyz' appear in?", "Have you got any videos on subject 'def'?" and so forth. The librarian is able to answer these questions by inspecting the loan file, the actor index, the subject index and the title index.

In addition to the above duties, the librarian receives new videos from the social committee of the club. On receipt of a new video, the librarian has to make a video card for insertion in the video sleeve and then insert relevant entries for the indexes. The librarian is also responsible for amending the library copy of the membership book with changes of the addresses and at the end of the year, collecting the new membership book from the club secretary.

Note : The selection, ordering and payments for the videos are not considered relevant within the terms of the case study.

- 1) (a) Create instances any four of the classes identified for the given case study.

(10% Marks)

**ANSWER IN THIS BOX**

**Dim myMember as new Member**

**Dim myBorrowedCopy as new BorrowedCopy**

**Dim myReservedCopy as new ReservedCopy**

**Dim myVideoCopy as new VideoCopy**

- (b) Describe “Initialize event procedure” and “Terminate event procedure” in Visual Basic 6.

(25% Marks)

**ANSWER IN THIS BOX**

**Initialize event procedure is the constructor of a class and Terminate event procedure is the destructor of a class. Usually, the Initialize event procedure contains any code, which needs to be executed at the moment the object is created.**

**Terminate event procedure of a class may have code which is executed in order for cleaning up after the particular object, which contains the terminate event, is being destroyed.**

- (c) MS SQL server ver. 7 had been used as the Relational Database Management System for the above MIS system. The developer of the system has used ADO s for connecting the Front End with the Back End. He has written a function for opening the database connection called OpenDB. Complete the following code. Use the variables myCnn for connection and myConnectionString as String variable for the connection string.

Database= Video;Server= Mugalan; uid =cats; pwd = mycat1

Public Function OpenDb(...(1)...myCnn as Adodb.Connection, ....(2)... myConnectionString as String) as Boolean

Set myCnn = new .....(3).....

MyConnectionString = “.....(4) .....”

myCnn.open myConnectionString

End Function

Describe byref and byval.

(30% Marks)

**ANSWER IN THIS BOX**

**(1) Byref**

**(2) ByVal**

**(3) Adodb.connection**

**(4) “Provider=SQLOLEDB;Data Source=Mugalan; Initial Catalog =video;uid  
=cats;pwd=mycat1”**

**ByRef: Indicates that the argument is passed by reference.**

**ByVal: Optional. Indicates that the argument is passed by value**

- (d) The developers of the Video library MIS have created several stored procedures on the server to index obscure videos. How would they invoke the stored procedures to run on the server?

(15% Marks)

**ANSWER IN THIS BOX**

Command objects are required to run stored procedures.

- (e) (i) What is a parameterized query?  
(ii) Modify the following SQL statement to make it a parameterized query.  
“insert into myTable (indexNo,Lastname) values ('c20395','De Silva’)

(20% Marks)

**ANSWER IN THIS BOX**

(i) A parameterized query is a query or command that allows one to set parameter values before the command is executed. For example, an SQL string can be parameterized by embedding parameter markers in the SQL string (designated by the '?' character).

(ii) “Insert into myTable (indexNo,Lastname) values(?,?)”

- 2) (a) What does Option *Explicit* do? Identify the place to insert option *Explicit*.

(10% Marks)

**ANSWER IN THIS BOX**

Option Explicit forces users to declare variables prior to its usage.

In the General Declaration section of each and every form module, one has to write option Explicit in order to enforce the declaration of variables prior to their usage.

- (b) Describe property procedures: *let*, *get* and *set*.

(10% Marks)

**ANSWER IN THIS BOX**

1. Property Let: Returns the value of a property
2. Property Get: Sets the value of a property
3. Property Set: Sets the value of an object property (that is, a property that contains a reference to an object)

- (c) Briefly explain what an object is. List three Objects in Visual Basic 6.

(20% Marks)

**ANSWER IN THIS BOX**

An object is a combination of code and data that can be treated as a unit. An object can be a piece of an application, like a control or a form. An entire application can also be an object. The following table describes examples of the types of objects one can use in Visual Basic.

Three of the objects are:

Command Buttons,

Forms, and

Database objects.

- (d) Where do objects come from and how would one create an object? Write lines of code to show how to create an object.

(20% Marks)

**ANSWER IN THIS BOX**

Objects come from Classes. One has to create an instance of a class for an object of that class.

If there is a class called car then the following line of code will create an instance to that class.

Dim myObject as car

Set myObject = new car

Dim myObject as new car

(e) How is Polymorphism described and how is implemented in Visual Basic 6.

(20% Marks)

**ANSWER IN THIS BOX**

Polymorphism is described as having many forms. Polymorphism is implemented through interfaces in Visual Basic 6.

(f) What does “*implements*” keyword do? Describe what interfaces are.

(20% Marks)

**ANSWER IN THIS BOX**

Implements keyword implements interfaces.

An interface is a collection of prototypes representing the members (methods and properties) the interface encapsulates; that is, it contains only the declarations for the member procedures.



- 3) Arrays can be used to store information about indexed items. Mr. M. Lokusuriya maintains a small car park, which can accommodate 50 vehicles. Each parking block is numbered (1 to 50) and he issues a ticket to the driver. The block ID is printed on the ticket. Mr. Lokusuriya writes down the block ID (ticket no.) and the entry time in a register in order to calculate the fee, which is calculated on an hourly basis.

(a) State Two(2) possible datatypes which one can use to store the entry time.

(10% Marks)

**ANSWER IN THIS BOX**

**Any two of the following  
Variant, Date, String**

- (b) Explain how one can use a simple array, giving a sample VB coding, to assist Mr. M. Lokusuriya's work?

(25% Marks)

**ANSWER IN THIS BOX**

**A simple array of variant /date/string data type can be used by the array being indexed from 1 to 50.**

**Dim Vpark(1 To 50) As Variant or Dim Vpark(1 To 50) As Date**

**(Or change the option base to 1 and define as dim Vpark(50) as date etc.)**

- (c) Mr Lokusuriya checks all the tickets every morning and starts with a new page of the register. A similar method can be adopted on the computer system. Write a procedure to initialize all the information.  
 You may start your procedure as  
 Private Sub CreateNewTicketList(ByRef Vpark As Variant)

(25% Marks)

**ANSWER IN THIS BOX**

**Private Sub CreateNewArray(ByRef Vpark As Variant)**

**For a = 1 To 50**

**Vpark(a) = Empty** '(Null or any Initial value null cannot be used with Date data type)

**Next a**

**End Sub**

- (d) Write a simple function to return the available parking block ID (ticket no). The function must return that value 0 if all blocks are full.

(30% Marks)

**ANSWER IN THIS BOX**

**Private Function AvailableBlock(ByVal Vpark As Variant)**

**Dim blockCounter As Integer**

**For blockCounter = 1 To 50**

**If IsEmpty(mypark(blockCounter)) Then** '(can use null property or default value)

**AvailableBlock = blockCounter**

**Exit Function**

**End If**

**Next blockCounter**

**AvailableBlock = 0**

**End Function**

- (e) If Mr. Lukusuriya needs to reserve the first ten parking blocks for the staff of “Royal Company (PVT) Ltd. what changes must be made to the previous answer?

(10% Marks)

**ANSWER IN THIS BOX**

For statement should be changed into

For blockCounter = 10 To 50

- 4) (a) Write property procedures in Visual Basic 6 and state the differences between sub procedures and functions.

(20% Marks)

**ANSWER IN THIS BOX**

The property procedures are: set, get and let.

Sub procedures do not return values but functions do.

- (b) Having gone through the following lines of code, describe the difference between (1) and (2):

Load frmForm1 -----(1)

frmForm1.show -----(2)

(20% Marks)

**ANSWER IN THIS BOX**

Load method loads form object into the memory and show method loads it into memory and shows the form.

(c) Describe “*Late binding*” and “*Early binding*”.

(30% Marks)

**ANSWER IN THIS BOX**

**Late binding:** When a variable is declared As Object, Visual Basic cannot determine at compile time what sort of object reference the variable will contain. In this situation, Visual Basic must use late binding— that is, Visual Basic must determine at run time whether or not that object will actually have the properties and methods used in the code.

**Early binding:** If Visual Basic can detect at compile time what object a property or method belongs to, it can resolve the reference to the object at compile time. The compiled executable contains only the code to invoke the object's properties, methods, and events. This is called early binding.

(d) What does COM/DCOM stand for? Describe what an ActiveX is.

(30% Marks)

**ANSWER IN THIS BOX**

**COM/DCOM** stands for Component Object Model or Distributed Component Object Model. An *ActiveX component* is a unit of executable code, such as an .exe, .dll, or .ocx file, that follows the ActiveX specification for providing objects. ActiveX technology allows programmers to assemble these reusable software components into applications and services.

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