TITLE	**HET: DIPLOMA IN INFORMATION TECHNOLOGY**
SUBJECT	**Programming 3B**
SUBJECT CODE	**PRG320 / PRG420**
TEST/EXAM	**Exam Memo**
SEMESTER	**2nd**
DATE WRITTEN	**16 November 2021**

NUMBER OF PAGES	**10**
TOTAL MARKS	**100**
DURATION	**2 HOURS**
PASS MARK	**50%**
WEIGHTING	**60%**
EXAMINER	**Thandanani Dube**

REQUIREMENTS:

Learner Requirements:

Equipment Requirement:

This paper consists of: **100 Marks**

1. Section A: Short Questions 30 Marks
2. Section B: Medium Questions 10 Marks
3. Section C: Long Questions 60 Marks

Unless otherwise stated, please answer ALL questions.

Please read the assessment rules and regulations that follow

Learners are warned that contravening any of the examination rules or disobeying the instructions of an invigilator could result in the examination being declared invalid. Disciplinary measures will be taken which may result in the students' expulsion from Damelin.

ASSESSMENT RULES AND REGULATIONS

Please ensure that you have read and fully understand the following assessment rules and regulations prior to commencing with your assessment:

1. To be permitted access to the examination, a learner must arrive with:
    1.1 an Identity Document or other official proof of identity (for example, - a student card, passport or driver's licence card with photo); and
    1.2 The required exam stationery.
2. No learner may enter the examination room more than 30 minutes after the examination sitting has commenced and no candidate may leave the room less than one hour after the examination sitting has commenced.
3. No extra time will be allowed should a student arrive late.
4. All learners must sign the *Attendance Register* for the examination on arrival.
5. It is the responsibility of learners to familiarise themselves with the examination rules prior to sitting for the examination.
6. All examinations are to be written on the date and time officially stipulated by the College.
7. It is the responsibility of learners to ensure that they are writing the correct paper and that the question paper is complete
8. Cell phones must be switched *off* prior to entering the exam venue. Cell phones and wallets may be placed under candidates' chairs rather than at the front of the room.
9. Learners may not handle cell phones or wallets during the exam.
10. No weapon of any description may be taken into the assessment room.
11. All personal belongings are to be placed at the front of the examination room. Personal belongings brought to the examination are at the owner's risk.
12. Smoking is not permitted and learners will not be allowed to leave the examination room in order to smoke
13. Once the examination has commenced, all conversation of any form between candidates must cease until after candidates have left the room, after the examination.
14. *Only* the official College examination book, as supplied by the College, may be used.
15. Learners must ensure that their student number is written on the answer book.
16. Learners are responsible for ensuring that they follow the instructions in the examination for submitting their answers.
17. Please read the instruction appearing on the examination paper carefully
18. The number of every question must be clearly indicated at the top of every answer.
19. No pages may be torn out of the answer book. All question papers and scrap paper must be handed to the invigilator after the examination.
20. Learners finishing earlier are to leave the examination room as quietly as possible on the instruction of the invigilator, and may not talk until outside the building where the examination is being written.
21. Only under exceptional circumstances will a learner be permitted to leave the examination room during the examination, and if the invigilator gives permission. An invigilator must accompany the learner. Only one learner at a time may be absent from the examination room.
22. Candidates may not act dishonestly in any respect.

SECTION A: SHORT QUESTIONS **[30]**

Answer all questions in this section.

Question 1: **[20]**

1.1 The _____ reference is the reference to an object that is implicitly passed to an instance method of its class.

A. Ref

B. Extends

C. this

D. Obj

1.2 Why are traditional authentication methods unsuitable for use in computer networks?

A. They do not use cryptographical techniques

B. They do not permit high speed data flow

C. They use passwords

D. they are incompatible with the internet

1.3 What can a firewall protect against?

A. Viruses

B. unauthenticated interactive logins from the "outside" world

C. fire

D. connecting to and from the "outside" world

1.4 An _____ of a class is a created object.

A. Instantiation

B. Declaration

C. Definition

D. Inheritance

1.5 What is the main purpose of access control?

A. to authorise full access to authorised users

B. to limit the actions or operations that a legitimate user can perform

C. to stop unauthorised users accessing resources

D. to protect computers from viral infections

1.6 Which of the following is NOT a good property of a firewall?

A. only authorised traffic must be allowed to pass through it

B. the firewall itself, should be immune to penetration

C. it should allow for easy modification by authorised users

D. traffic must only be allowed to pass from inside to outside the firewall

1.7 To _____ an object is to create it.

A. Instantiate

B. Declare

C. Specify

D. Assign

1.8 The location of a computer that is attached to the Internet is determined by its

A. network

B. IP address

C. URL

D. Processor

1.9 The _____ of a class are the data components that exist separately for each instantiation.

A. Instance variables

B. Object variable

C. Initialised variable

D. Constant variable

1.10 Together, the four basic operations of a processor (fetching, decoding, executing, and storing) comprise a _____ cycle.

A. baseline

B. machine

C. registration

D. pipeline

Answer all questions in this section.

State whether true or false:

Question 2: **[10]**

2.1 Binary files contain data that has been encoded in binary format.

True

2.2 A character is any one of the letters, numbers, or other special symbols (such as punctuation marks) that comprise data.

True

2.3 Programmers say FileStream exposes a stream around a file.

True

2.4 The File class contains methods that allow you to access information about files.

True

2.5 Folders or directories are structures used to organize files on a storage device

True

Define the following terms:

Question 3: **[10]**

1. **Checkbox objects:** **are GUI widgets the user can click to select or deselect an option. When a Form contains multiple Checkboxes, any number of them can be checked or unchecked at the same time.**

2. **A ComboBox:** **is like a ListBox, except that it displays an additional editing**

3. **A GroupBox:** **or Panel can be used to group related Controls on a Form**

4. **The ListBox:** **Control enables you to display a list of items that the user can select by clicking.**

5. **RadioButtons:** **are like CheckBoxes, except that when they are placed on a Form, only one RadioButton can be selected at a time—selecting any RadioButton automatically deselects the others.**

Answer all questions in this section.

Practical question:

Question 4: **[30]**

In the test program, create a couple of Students and a couple of Dogs, and store them each in a Pair. You will then create delegate objects to encapsulate their respective methods that match the delegate signature and return type, and ask the Pair objects to sort the Dog and Student objects. Let's take this step by step.

Begin by creating a Pair constructor that takes two objects and stashes them away in a private array:

```
public class Pair {
// two objects, added in order received
public Pair (object firstObject, object secondObject)
{
thePair[ 0] = firstObject; thePair[ 1] = secondObject;
}
// hold both objects
private object[ ]thePair = new object[ 2];
//Next, you override ToString ( ) to obtain the string value of the two objects:
public override string ToString( )
{ return thePair [ 0] .ToString( ) + ", " + thePair[ 1] .ToString( );
}
```

you require that each object stored in a Pair implement a method to return which of the two comes first. The method will take two objects (of whatever type) and return an enumerated value:

These required methods will be encapsulated by the delegate Which Is First that you define within the Pair class:

```
public delegate comparison WhichIsFirst(object obj1, object obj2);
```

The return value is of type comparison, the enumeration.

```
public enum comparison
{
theFirstComesFirst = 1;
theSecondComesFirst = 2;
}
```

Any static method that takes two objects and returns a comparison can be encapsulated by this delegate at runtime.

You can now define the Sort method for the Pair class:

```
public void Sort(WhichIsFirst theDelegatedFunc) {
if (theDelegatedFunc(thePair[ 0] ,the-
Pair[ 1]) == comparison. theSecondComesFirst)
{
object temp = thePair[ 0]; thePair[ 0] = thePair[ 1];
thePair[ 1] = temp;
}
}
```

Question 5: **[30]**

C# views each file in the computer as sequential streams of bytes. Each file ends either with an end-of file marker or at a specific byte number that is recorded in a system data structure.
When a file is opened, an object is created and as stream is associated with the objects.
There are many file-processing classes in the .Net Framework Class library. The System.IO namespace includes stream classes such as the StreamReader (for text input from a file), StreamWriter (for text output to a file) and FileStream (for both input from and output to a file) These Stream classes inherit from abstract classes TextReader, TextWriter and Stream, respectively. The abstract class Stream provides functionality for representing streams as bytes.

There are 15 errors in this demonstration correct them to allow the program to function correctly

```
using System.IO;
namespace WPFSample
{
/// <summary>
/// Interaction logic for File_Test.xml
/// </summary>
public partial class File_Test: Window
{
public File_Test ()
{
InitializeComponent ();
}
//invoked when the user press key
private void inputTextbox_KeyDown (object sender, KeyEventArgs e)
{
```

```
// determine whether the user pressed the enter key
{
if (e. KeyCode==Keys.Enter)
{
// get the user specified file name as a file
string filename = inputTextbox.Text;
//determine if the file name is a file
if (File. Exists(filename))
{
//get file's creation date, modification date e.tc.
GetInformation(filename);
StreamReader Stream = null;//declare streamreader
// display the file content using stream
try
{
//obtain reader and file content
using (Stream = new StreamReader(filename))
{
Outputbox.AppendText(Stream.ReadToEnd());
}//end using
}// end try
catch (IOException)
{
MessageBox.Show("Error reading from file");
}//end catch
}
//end if
//determine whether filename is a directory
else if (Directory.Exists(filename))
{
// get directory creation date
GetInformation(filename);
//obtain the file directory specifies
```

```
string [] directorylist = Directory.GetDirectories(filename);
Outputbox.AppendText("Direct contents:\n");
// output directorylist content
foreach (var directory in directorylist)
Outputbox.AppendText(directory + "\n");
} //end else if
else
{
MessageBox.Show(inputTextbox.Text + "Does not exist");
}
}
}
}
private void GetInformation (string filename)
{
//output that file or directory exist
Outputbox.AppendText(filename + "exist");
// output when the file was created
Outputbox.AppendText("Created:" + File.GetCreationTime(filename) + "\n");
// out last modify
Outputbox.AppendText("last modified" + File.GetLastWriteTime(filename + "\n"));
// output last access
Outputbox.AppendText("Last access:" + File.GetLastAccessTime(filename +"\n"));
}
}
}
```

TOTAL MARKS: 100