INTI
INTERNATIONAL COLLEGE PENANG (507232-U)
LAUREATE INTERNATIONAL UNIVERSITIES

FINAL
Examination Paper

(COVER PAGE)

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| Session | : | **AUGUST 2014** |
| Programme | : | DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING |
| Course | : | **ICT 1103 : STRUCTURED PROGRAMMING** |
| Date of Examination | : | December 5, 2014 (Friday) |
| Time | : | 3.00pm – 5.00pm Reading Time : Nil |
| Duration | : | 2 Hours |
| Special Instructions | : | |

This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Materials permitted :

Nil

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Nil

| | | |
|---|---|---|
| Examiner(s) | : | **Ms. Chern Huey Rong** |
| Moderator | : | **Dr. Raja Ahmad Iskandar** |

*This paper consists of _8_ printed pages, including the cover page.*

DIPLOMA IN ENGINEERING

ICT1103: STRUCTURED PROGRAMMING

FINAL EXAMINATION: AUGUST 2014 SESSION

Instructions: This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

| **Question 1** | |
|---|---|
| (a) | Write a program that asks the user to enter **THREE (3)** numbers, then prints the smallest and the largest number. |
| | (6 marks) |
| | |
| (b) | Write a single C++ statement or a line that accomplishes each of the following:<br>(i) Print the message "Enter two numbers".<br>(ii) Assign the product of variables **b** and **c** to variable **a**.<br>(iii) State a program that performs a simple payroll calculation (i.e., use text that helps to document a program.)<br>(iv) Input three integer values from the keyboard & assign into integer variables **a,b** and **c**.<br>(v) If a boolean variable **isDone** is true, then exit the function.<br>(vi)Pass an integer array **n[10]** to a function called **fx()** |
| | (6 marks) |
| | |
| (c) | Write a program that reads an integer and determines and prints whether it is odd or even. |
| | (5 marks) |
| | |

(d) Rewrite the following program by replacing the *if/else* statements with *switch* statements.

```
#include <iostream>
using namespace std;

int main()
{
      int x, y,selection;
      int result;

      cout<<"Enter two integers:";
      cin>>x>>y;

      cout<<"What operation do you want to perform for the "
            <<"two input integers?"<<endl
            <<"1. Add\n2. Subtract\n3. Multiply\n4. Divide"<<endl
            <<"Enter your selection (1/2/3/4):";
      cin>>selection;

      if (selection==1) result=x+y;
      else if(selection==2) result=x-y;
      else if(selection==3) result=x*y;
      else if(selection==4) result=x/y;
      else
      {    cout<<"Invalid input. Can't perform the
      operation"<<endl;
           system("pause");
            return 0;
      }

      cout<<"Result of the selected operation is "<<result<<endl;
      system("pause");
      return 0;
}
```

(8 marks)

**Question 2**

(a) A laundry shop charges it's customer RM5 for every kilogram of laundry. Write a program that asks for the laundry weight and if ironing is wanted. For every kilo, RM7 is charged for ironing. Display the total price (inclusive of the ironing cost). Example output display for a single laundry is shown below:

```
Enter the weight of laundry: 12.50
Ironing needed?(0==no, 1==yes): 1

Total laundry cost: RM62.50
Ironing cost: RM87.50
Total: RM150.00
```

(9 marks)

(b) Assume an array:

```
a[10] = {1,2,3,4,5,6,7,8,9,10};
```

Write a program that contains a function **searchNumber** that accepts the array above and also a number which a user inputs to search for. If the number is found, the function should return the array index where the number was found. If the number is not found, then return -1. The main function should then print appropriate messages to indicate whether the number was found or was not found.

(10 marks)

(c) Identify and correct the errors in each of the following:

(i)
```
if(c<7);
   cout<<"c is less than 7\n";
```

(ii)
```
if(c=>7)
    cout<<"c is equal to or greater than 7\n";
```

(iii) The following code should print the values 1 to 10.
```
n = 1;
while(n<10)
  cout<<n++<<endl;
```

(iv)
```
#include <iostream>;
```

(v)
```
if ( age >= 65 )
    cout << "Age is greater than or equal to 65" << endl;
 else
    cout << "Age is less than 65 << endl";
```

(vi)
```
While ( x <= 100 )
    total += x;
 ++x;
```

(6 marks)

**Question 3**

(a) What does the following program display?

```
#include <iostream>
using namespace std;

int _tmain(int argc, _TCHAR* argv[])
{
	int i;
	int k;
	for (i=1; i<15; i++)
	{
		cout<<"Iteration "<<i<<"\n";
		if(i<3)
		{
			k = i+8*6/3;
		}
		else if(i<5)
		{
			k = i/2+26-8;
		}
		else if(i<=8)
		{
			k =   2+5*i+26;
		}
		else
		{
			k = i-5*2;
		}
		cout<<"The output is ==>"<<k<<"\n";
	}

	return 0;
}
```

(7 marks)

(b) Write a program that asks the user to type 10 integers of an array. The program will then display either "the array is growing", "the array is decreasing", "the array is constant", or "the array is growing and decreasing."

(10 marks)

(c) Suppose we have the following structure declaration:

```
struct applicant {
	char name[30];
	int credit_ratings[3];
};
```

Write a function that takes the address of an applicant structure as an argument and displays the contents of the pointed-to structure.

(4 marks)

(d) What do the expression *"pizza" and "taco"[2] mean? Describe the meaning accordingly.

(4 marks)

**Question 4**

(a) Trace the output of the following program:

```
#include <iostream>
using namespace std;
void mystery1(int, int &);
void mystery2(int *, int);

void main()
{       int a=3,b=6;
        mystery1(a,b);
        cout<<a<<"\t"<<b<<endl;
        int *p=&a, q=b;
        *p=q+a;
        q=q-*p;
        cout<<*p<<"\t"<<q<<endl;
        cout<<a<<"\t"<<b<<endl;
        mystery2(p,q);
        cout<<*p<<"\t"<<q<<endl;
        cout<<a<<"\t"<<b<<endl;
}

void mystery1 (int x, int &y)
{       x       = x * x;
        y       = y * y;
}

void mystery2( int *j, int k)
{       *j      =*j + *j;
        k       = k + k;
}
```

(10 marks)

(b) Given a bag that contains 10 balls each labeled 0,1,2,3,4,5,6,7,8,9. If 3 balls were to be taken from the bag, write a program to display all the possible combinations of numbers of the balls and indicate the total number of combinations.

(7 marks)

(c) Write a program that simulates coin tossing. For each toss of the coin, the program should print **Head** or **Tail**. Let the program toss the coin 100 times and count the number of times each side of the coin appears. Print the results. The program should call a separate function **flip** that takes no arguments and returns **0** for tail and **1** for head.

(8 marks)

**Question 5**

(a) Write a program to calculate and display the rent for an apartment based on the information provided in the table below. The program should read from the user the apartment type (either 1, 2, or 3 bedroom), the number of baths, and number of days rented. If a requested apartment type is not available, set the rent to 0. The user may choose to rent more than one apartment. The program should display the rent for each apartment as well as the total rent for all the apartments rented.

| Type of apartment | 1 bath | 2 baths |
|---|---|---|
| 1 bedroom | RM629.00 | Not available |
| 2 bedrooms | RM845.00 | RM985.00 |
| 3 bedrooms | Not available | RM1125.00 |

(11 marks)

(b) Write a program to read from an input file called "participants.txt" and extracted the names of those people whose age is below 20. The names are then being written into another file named "teens.txt". Example of the input file is as below :

```
James    24
Brown    18
Banner   14
Johnson  29
Kent     10
```

(8 marks)

(c) Summarize on user defined data types in C++.

(6 marks)

**Question 6**

(a) Write a program that inputs a five-digit number, separates the number into its individual digits and prints the digits separated from one another by three spaces each. (Hint: Use the integer division and modulus operators.) For example, if the user types in **42339** the program should print: **4 2 3 3 9**

(10 marks)

(b) What is displayed by myFunction(15,5)? What is the value that it returns?

```
int myFunction (int m, int n)
{
   int ans;
   if (m < 10)
      if (n < 10)
         ans = m + n;
      else
         ans = myFunction(m, n-2) + n;
   else
      ans = myFunction(m-1, n) + n;
   cout << ans << "\t";
   return ans;
}
```

(7 marks)

(c) How could you use C++ to find out which character the code 88 represents? Explain **FOUR (4)** ways.

(8 marks)

**--THE END--**