



FINAL
Examination Paper

(COVER PAGE)

Session : April 2014

Programme : Diploma In Information And Communication Technology
(DICTN /DICTI)

Course : ICT1103 / CSC1103 : Structured Programming

Date of Examination : July 21, 2014

Time : 2:00pm – 4:00pm Reading Time: Nil

Duration : 2 Hours

Special Instructions :

Answer any **FOUR (4)** questions.

Materials permitted : Nil

Materials provided : Nil

Examiner (s) : Ms. Pawani Rasaratnam, Chern Huey Rong, Samuel Kan Wen Hung.

Moderator : Ms. Siti Hawa Mohamed Said

This paper consists of 5 printed pages, including the cover page.

INTI INTERNATIONAL COLLEGE SUBANG

DIPLOMA IN COMPUTING & INFORMATION TECHNOLOGY PROGRAMME
(DICTN / DICTI)

ICT1103 / CSC1103: STRUCTURED PROGRAMMING

FINAL EXAMINATION: APRIL 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 reads two integers. Determine and print whether the first number is the multiple of the second number.

(5 marks)

(b) Write C++ statements to accomplish each of the following:

(i) Using only one statement assign the sum of the current value x and y to z and increment the value of x .

(ii) Determine whether the value of the variable $count$ is greater than 10. If it is, display "Count is greater than 10."

(iii) Decrement the variable x by 1, then subtract it from the variable $total$.

(iv) Calculate the remainder after q is divided by divisor and assign the result to r .

(8 marks)

(c) A mail order house sells five different products whose retail prices are as follows:

product 1- \$2.98
product 2 - \$4.50
product 3 - \$9.98
product 4 - \$4.49
product 5 - \$6.87

Write a program that reads a series of products which consist of:

(i) Product number

(ii) Quantity sold for one day

Your program should use a switch statement to help determine the retail price for each product. Your program should calculate and display the total retail value of all products sold.

(12 marks)

Question 2

- (a) List any **FOUR (4)** data types in C++ language. Give an example for each. (8 marks)
- (b) Write a program that will replace all occurrences of a letter 'g' and 'G' in an input word with an asterisk '*'.
 Sample run:
 Input : Gary and George are lying
 Output: *ary and *eor*e are lyin*
- (9 marks)
- (c) You are asked to write a program that allows the user to enter a series of integer. The program shall determine and display the number of negative integers, the number of zero integers and the number of positive integers. User can stop the input by entering a sentinel value of -999. (8 marks)

Question 3

- (a) Assume an array such as below:

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Write a program that contains a function called 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 display appropriate messages to indicate whether the number was found or was not found.

(10 marks)

- (b) Write a function called qualityPoints that inputs a student's average and returns 4 if the average is 90-100, 3 if the average is 80-89, 2 if the average if 70-79, 1 if the average is 60-69 and 0 if the average is lower than 60. Write a program to execute your function. (8 marks)
- (c) Write a C++ program to display out the following. You are required to use for loop.

1 x 13 = 13	1 x 14 = 14	1 x 15 = 15	1 x 16 = 16
2 x 13 = 26	2 x 14 = 28	2 x 15 = 30	2 x 16 = 32
3 x 13 = 39	3 x 14 = 42	3 x 15 = 45	3 x 16 = 48
4 x 13 = 52	4 x 14 = 56	4 x 15 = 60	4 x 16 = 64
5 x 13 = 65	5 x 14 = 70	5 x 15 = 75	5 x 16 = 80

(7 marks)

Question 4

- (a) Write a program to get a number from the user. Use it as first number to generate Hailstone sequence. Display the total count of numbers in this Hailstone sequence.

Hailstone sequence is a sequence of numbers that will eventually end up in 1 by following a simple rule as follows:

if the number is even halve it by two,

if it's odd times it by three and add one

(e.g., starting with the number 16 the sequence would be 16, 8, 4, 2, 1

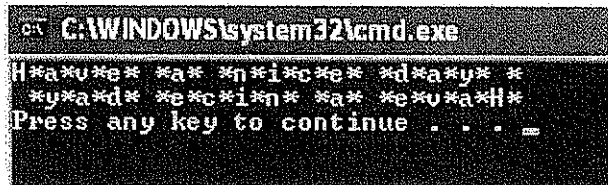
starting with the number 21 the sequence would be 21, 64, 32, 16, 8, 4, 2, 1).

(9 marks)

- (b) Assume an array:

```
char x[16]="Have a nice day";
```

Write a program using pointer to display the characters of a string as shown below:



(6 marks)

- (c) Write a program in which the user is asked repeatedly to input integers from 1 to 5. The program should inform the user when he or she enters an integer that accumulates the sum of the input integers over 21. In addition to printing the message OVER 21, the computer should print the sum and the last integer entered.

Sample output :

Enter some integers :

5

4

2

3

4

4

OVER 21

The sum is 22

The last integer you entered is 4

(10 marks)

Question 5

- (a) Write a program to read several integers from the user. The user shall stop the input by entering a sentinel value of -1. Determine and print the largest integer and the average.

(7 marks)

- (b) The distance between two points in a coordinates system is given by the following formula

$$s = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

Write a program to read in the coordinates of the two points and display the distance between them.

(7 marks)

- (c) Identify and correct the error(s) in each of the following program statements :

- (i) `cout << Happy Birthday;`
- (ii) `cin >> num1 << num2;`
- (iii) `int my_var = 10.0;`
- (iv) `char my_array[10] = 'a';`
- (v) `for (int x = 1; x >= 10; x++)`
- (vi) `*ptr = &var1;`

(6 marks)

- (d) Trace the output of the following program :

```
#include <iostream>
using namespace std;
void main( )
{
    int a = 4;
    cout << "Value of a : " << a << endl;
    cout << "Value of a++ : " << a++ << endl;
    cout << "New value of a : " << a << endl;
    cout << "Value of --a : " << --a << endl;
    cout << "New value of a : " << a << endl;
}
```

(5 marks)

Question 6

- (a) Write a function `integerPower(base, exponent)` that returns the value of $\text{base}^{\text{exponent}}$

For example, `integerPower(3,4) = 3*3*3*3`. Assume that *exponent* is a positive, non zero integer and that *base* is an integer. The function `integerPower` should use `for` or `while` loop to control the calculation. Do not use any math library functions.

(6 marks)

- (b) An integer is said to be a perfect number if the sum of its factors, including 1 (but not the number itself), is equal to the number. For example 6 is a perfect number, because $6 = 1 + 2 + 3$. Write a function `perfect` that determines whether parameter number is a perfect number. Use this function in a program that determines and prints all the perfect numbers between 1 and 1000.

(9 marks)

- (c) Write codes to request a set of (x, y) coordinates and a name from user, then sort and display them in ascending order distance from the origin (0, 0). Define struct to hold coordinates and name of each point.

(10 marks)