



FINAL
Examination Paper

(COVER PAGE)

Session : AUGUST 2017

Programme : Diploma in Information And Communication Technology (DICTN)

Course : ICT1103: Structured Programming

Date of Examination : 13 December, 2017 (Wednesday)

Time : 5:00 pm – 7:00 pm Reading Time : Nil

Duration : 2 Hours

Special Instructions :

Answer all SIX (6) questions in the answer booklet provided.

Materials permitted : Non-programmable calculator

Materials provided : Nil

Examiner(s) : Chern Huey Rong and Shee Fui Chee

Moderator : Siti Hawa Binti Mohamed Said

This paper consists of 6 printed pages, including the cover page

DIPLOMA IN COMPUTER AND INFORMATION TECHNOLOGY PROGRAMME (DICTN)
 ICT1103: STRUCTURED PROGRAMMING
 FINAL EXAMINATION: AUGUST 2017 SESSION

SECTION A: (60 marks)

Instruction: This section consists of **FOUR (4)** questions. Answer **ALL** questions in the answer booklet provided.

Question 1

- (a) Write a program that asks the user to type an integer N and computes the sum of the cubes from 5^3 to N^3 . (5 marks)
- (b) Provide **FOUR (4)** ways to decrease the value of a variable by 1. (4 marks)
- (c) Tracing output for the following code fragment:
- (i)

```
float x;
x = 9 / 2;
cout << x<<endl;
x = (float)9 / 2;
cout << x << endl;
```
- (ii)

```
int z = 5, y = 2;
z %= ++y;
cout << "z = "<<z <<endl<<" y = "<<y<<endl;
```
- (iii)

```
int a = 10;
int &b = a;
a++;
cout << a << " " << b++<<endl;
```

(6 marks)

(Total: 15 marks)

Question 2

(a) What are the ESCAPE SEQUENCES used for the following descriptions?

- (i) Null character
- (ii) Print a \
- (iii) New-line
- (iv) Move cursor backward one position

(4 marks)

(b) A selection structure should display one of the following message, depending on a student's test score. Write the C++ code fragment using **if statement** to display one of the message.

Message	Test score
Great score!	At least 90
Good Score	50 through 89
Retake the test	0 through 49
Invalid test score	less than 0

(6 marks)

(c) Convert the following **if statement** into **switch statement**:

```

if (pizza_size == 'S' || pizza_size == 's')
    price = 5.9 - coupon;
else if (pizza_size == 'M' || pizza_size == 'm')
    price = 9.9 - coupon;
else if (pizza_size == 'L' || pizza_size == 'l')
    price = 12.9 - coupon;
else
    cout << "Invalid size\n";

```

(5 marks)

(Total: 15 marks)

Question 3

- (a) Write a loop statement to calculate the result of the following formula:

$$1 + \frac{1}{3^2} + \frac{1}{9^3} + \frac{1}{12^4} \quad (5 \text{ marks})$$

- (b) Use recursion function to compute a^n , where n is a positive integer.

(6 marks)

- (c) Write a **loop statement** to validate the input of a number is positive. If the number user entered is negative, it will respond back to user saying invalid input until the number entered is positive.

(4 marks)

(Total: 15 marks)

Question 4

- (a) The country A has 50M inhabitants, and its population grows 3% per year. The country B, 70M and grows 2% per year. Write a program to tell in how many years population of A will surpass B. (6 marks)
- (b) Write a program that asks the user to type 10 integers of an array and an integer value V and an index value i between 0 and 9. The program must put the value V at the place i in the array, shifting each element right and dropping off the last element. The program must then write the final array.

```

C:\WINDOWS\system32\cmd.exe
Enter the value to insert: 88
Enter index (0-9) in which to place the value: 5
Enter the 10 integer values:
array[0]: 2
array[1]: 4
array[2]: 6
array[3]: 8
array[4]: 10
array[5]: 12
array[6]: 14
array[7]: 16
array[8]: 18
array[9]: 20
New values of array are:
2
4
6
8
10
88
12
14
16
18

```

(6 marks)

- (c) The skeletal outline of a C++ program is shown below: Identify and correct the errors in each of the following:

(3 marks)

- (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) `x = 1;`
`while(x <= 10);`
`x++;`
`}`

(Total: 15 marks)

SECTION B: (60 marks)

Instruction: This section consists of **TWO (2)** questions. Answer **ALL** questions in the answer booklet provided.

Question 1

A parking garage charges a \$2.00 minimum fee to park for up to three hours. The garage charges an additional \$0.50 per hours for each hour or part thereof in excess of three hours. The maximum charge for any given 24-hour period is \$10.00. Assume that no car parks for longer than 24 hours at a time. Write a program that calculates and prints the parking charges for each of three customers who parked their cars in the garage yesterday. You should enter the hours parked for each customer. Your program should print the results in a neat tabular format and should calculate and print the total of yesterday's receipts. The program should use the function **calculateCharges** to determine the charge for each customer. Your outputs should appear in the following format:

Car	Hours	Charge	
1	1.5	2.00	
2	4.0	2.50	
3	24.0	10.00	
TOTAL	29.5	14.50:	(20 marks)

Question 2

- a) Write a program that counts and display the number of vowels in the string input by user. Vowels include the characters 'a', 'e', 'i', 'o', and 'u'. (8 marks)
- b) Use a single-subscripted array to solve the following problem. A company pays its salespeople on a commission basis. The salespeople receive \$200 per week plus 9 percent of their gross sales for that week. For example, a salesperson who grosses \$5000 in sales in a week receives \$200 plus 9 percent of \$5000, or a total of \$650. Write a program (using an array of counters) that determines how many of the salespeople earned salaries in each of the following ranges (assume that each salesperson's salary is truncated to an integer amount):
- (i) \$200–\$299
 - (ii) \$300–\$399
 - (iii) \$400–\$499
 - (iv) \$500–\$599
 - (v) \$600–\$699
 - (vi) \$700–\$799
 - (vii) \$800–\$899
 - (viii) \$900–\$999
 - (ix) \$1000 and over
- (12 marks)

~THE END ~