INTI International University & Colleges

**FINAL**
Examination Paper

(COVER PAGE)

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| Session | : | **AUGUST 2019** |
| Programme | : | Diploma in Information Technology (DITN) |
| Course | : | **ICT1103: Structured Programming** |
| Date of Examination | : | December 7, 2019 (Saturday) |
| Time | : | 11:00am – 1:00pm Reading Time : Nil |
| Duration | : | 2 Hours |

**Special Instructions :**

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

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

Materials permitted :
Non-programmable calculator

Materials provided :
Nil

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Moderator : **Siti Hawa Binti Mohamed Said**

*This paper consists of 7 printed pages, including the cover page*

DIPLOMA IN INFORMATION TECHNOLOGY PROGRAMME (DITN)
ICT1103: STRUCTURED PROGRAMMING
FINAL EXAMINATION: AUGUST 2019 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 statement (or comment) to accomplish each of the following (assume that using declaration have been used for `cin`, `cout` and `endl`):

i) Declare the variables `x, y, z` and `result` to be of type int (in separate statements).
ii) Prompt the users to enter three integers.
iii) Read three integers from the keyboard and store them in the variables `x`, `y` and `z`.
iv) Compute the product of the three integers contained in variables `x, y` and `z`, and assign the result to the variable `result`.
v) Print "`The product is`" followed by the value of the variable `result`.

(5 marks)

(b) The following program code has some errors. Identify the errors with line numbers and appropriate solutions.

```
Line 1: #include <iostream>
Line 2: using namespace std;
Line 2: int main(int argc, char *args[]){
Line 3: int number1= 10; number2=20;
Line 4: float quotient=0;
Line 5: cout << "Enter two numbers: ";
Line 6: cin >> number1, number2;
Line 7: cout << "Division result\n";
Line 8: quotient =
          float<static_cast>(number1 / number2);

Line 9: cout << quotient ;
Line 10: return 0;
}
```

(6 marks)

(c) Explain Problem Definition and Problem Analysis phases of Program Development Life Cycle

(4 marks)

**(Total: 15 marks)**

**Question 2**

(a) Consider the following statements:

```
char str[]= "237.89";
double value;
```

Write a statement that converts the string in `str` to a `double` and stores the result in `value`. Next, display `value`.

(2 marks)

(b) Consider the following code. What value will be stored in s after the code executes?

```
char name [10];
int s;
strcpy(name, "Jimmy");
s = strlen(name);
```

(1 mark)

(c) What will the following programs print on the screen?

```
int main()
{
int freeze =32,boil =212;
freeze = 0;
boil = 100;
cout<<freeze<<endl<<boil<<endl;
return 0;
}
```

(1 mark)

(d) Trace the output for the following fragment of code:

```
int count = 1;
while (count++ < 5)
   cout << count * (count - 2) << " ";
   count /= ++count%2;
   cout << count << endl;
```

(5 marks)

(e) Write a code fragment that asks for one integer from the user. Total up all the integers from 1 to the integer value entered. Display all the values and the total. You are required to use `for` loop in your answer.

Sample output:

```
Enter a number: 5

1 2 3 4 5
The sum is 15.
```

(6 marks)

**(Total: 15 marks)**

**Question 3**

(a) The function `mulBy5` multiplies `5` to the integer parameter passed into it. Write appropriate function definition for the following function prototypes:

```
void mulBy5(int * num);
int mulBy5(int num);
```

(4 marks)

(b) Write a c++ expressions for the following algebraic expressions:

i. $a = 12x$

ii. $z = 5x + 14y + 6k$

iii. $y = x^4$

iv. $g = \frac{h+12}{4k}$

v. $c = a^3 / (b^2 k^4)$

(5 marks)

(c) Write C++ statements to define and initialize the following arrays:

i) An one-dimensional array called `seasons` and initialize to the following values:

"`fall`", "`winter`", "`spring`", "`summer`".

ii) An one-dimensional array called `symbols` and initialize to the following values:

`'$', '&', '#', '!', '^', '@'`

iii) A two-dimensional array called `map` and initialize to the following values:

```
1 0 1 1
1 0 0 1
1 1 0 0
```

(6 marks)

**(Total: 15 marks)**

**Question 4**

(a) Trace the output for the code fragments below:

```
int g = 4;
int *x = &g;
int *y;
y = new int;

*x = 6;
*y = 7;
*x = *x + 12;
g = g + 3;
cout<<*x<<" ,"<<*y<<" , "<<g<<endl;
x = y;
*x = *x + 25;
g = g + 31;
cout<<*y<<" ,"<<g<<endl;
```

(5 marks)

(b) Write a code fragment to open a file called `data.txt` for input. If the file does not exist, the code should create the file.

(4 marks)

(c) Write a function `checkCharRange` that contains a character parameter called `ch`. The function prints the message "`First Half!`" if the character is within the range `A` to `M`. The function then prints out "`Second Half!`" if the character is from `N` to `Z`. Other characters will print "`Invalid Range!`". Assume that the character `ch` is always in uppercase format.

(6 marks)

**(Total: 15 marks)**

**SECTION B: 40 marks**

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

**Question 1**

The One Bowling Centre offers special package for all the bowlers. Charge for each bowler is RM12. You have been appointed to develop an application to calculate the total price that should be paid by the person who booked the lane for all players.

Write a program that performs the following task:

- The program accepts booking from the person until the person press `0` to stop.
- The program accepts `num_of_player` from user using a function named `kiraCharge()`. Function `kiraCharge()` will calculate the `total_price` for the booking and return the value.
- In the main program:
    i. Store the value of `total_price` in an array order with size `n`. size `n` refers to number of booking per day.
    ii. Calculate the `total` and all the value in `order [n]`.
    iii. Display the `total` and all the value in `order [n]`.

**(Total: 20 marks)**

**Question 2**

Consider using structure data types to store a set of game data for a simple 2D game. Answer the following questions:

(i) Create a structure called `Location` that stores the following information:

`x`: x coordinate of game screen in integer format
`y`: y coordinate of game screen in integer format

(2 marks)

(ii) Create another structure called `Player` with the following elements:

`name` : player name as string type
`score` : game score as integer type
`status`: player condition either alive or gameOver as boolean type
`loc` : player location as `Location` type declared above

(3 marks)

(iii) Declare an array called `players` that can store up to `5` players in the 2D game. Create a global constant to hold the player size.

(2 marks)

(iv) Write a function called `setPlayersStatus` that accept an array as `Player` type (as declared in part iii). This function will set the player's status to `false` and score to `0` if the player's `x` and `y` location are out of screen boundaries (`x` less than `0` or `y` more than `800`).

(7 marks)

(v) Write a fragment of code to save all the active players' details to the sequential text file called `log.txt`.

(6 marks)

**(Total: 20 marks)**

**~The End~**