FINAL
ALTERNATIVE ASSESSMENT

(COVER PAGE)

Session	:	**APRIL 2021**			
Programme	:	Diploma In Computer Science (DCS)			
Course	:	**DCS1101: Programming Fundamentals**			
Date of Examination	:	July 28, 2021 (Wednesday)			
Time	:	4.00pm – 6.30pm	Reading Time	:	Nil
Duration	:	2 Hours 30 Minutes			

Special Instructions :

This paper consists of **FOUR (4)** questions. Answer **ALL** the questions. **Write ALL your answers** in the foolscap papers.

Note: 30 minutes is added into the duration of the examination to factor in any connectivity matters ar you to scan and upload your scripts.

Materials permitted :

Nil

Materials provided :

Nil

Examiner(s)	:	**Yogeswari Suppiah** and Lai Kim Min
Chief Moderator	:	Koo Lee Chun

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

DIPLOMA IN COMPUTER SCIENCE PROGRAMME (DCS)
DCS1101: PROGRAMMING FUNDAMENTAL
FINAL ALTERNATIVE ASSESSMENT: APRIL 2021 SESSION

Instruction: This paper consists of **FOUR (4)** questions. Answer **ALL** questions in the in foolscap papers.

Question 1

(a) A program requires the user to enter a whole number. If a positive number or 0 is entered, the program will store the number to a list and then ask the user to enter the next number. If the number entered is negative, the program will send the number list to a sorting routine and display the sorted numbers to the user. Draw a flowchart to represent this program.

(10 marks)

(b) Consider the following list of identifiers that are used for variables in a C++ program. Identify the validity for each identifier in two separate lists (Valid and Invalid). For the invalid identifiers, provide the reason.

`vaccineCovid`	`Main`	`2021population`	`True`	`switch`
`$money`	`Year1984`	`phone#`	`GRAVITY`	`Month 5`

(10 marks)

(c) Assume you have the following variables:

```
string country= "";
int code = 0;
```

Write C++ statements that prompt the user to input the country code then followed by the country name. The country name could be in several words such as "`Antigua and Barbuda`".

(5 marks)

(Total: 25 marks)

Question 2

(a) Write a code fragment with a nested for loop to produce the following output:

```
1....2...3..4.GO!
```

(6 marks)

(b) Rewrite the following switch case structure with the nested IF construct.

```
switch (id)
{
      case 'f':
      case 'F':
            cout << "Friends" ;
                        break;
      case 'r':
      case 'R':
            cout<< "Relatives" ;
            break;
      default:
            cout<< "Invalid Option!";

}
```

(7 marks)

(c) Write a code fragment with a while loop that prompts the user to enter a number in the range of 1 through 10 (inclusively). You should validate the user input and an appropriate error message should be printed and prompt the user to enter the number again.

(8 marks)

(d) Consider the following do while repetition structure:

```
int z = 5;
int sum=0;
do {
      sum += z;
}while (z>0);
```

Explain what is wrong with the above code fragment. Identify a solution to solve this problem.

(4 marks)

(Total: 25 marks)

Question 3

(a) Identify and explain two built-in functions in C++ which are used for character processing.
(4 marks)

(b) Write a function called `enterGrade`() that prompts the user to enter a letter in the range from 'A' to 'F'. If the letter is not in that range, the prompt should be repeated, else the function should return the valid grade letter to the calling program.
(7 marks)

(c) The following questions concern an array called `realNumbers`.

```
float realNumbers[100];
```

i) Write a for loop to initialize all the array element with the values 0.01, 0.02, 0.03…….,0.99, 1.00. (Hint: use the index number / 100.0 to get a fraction number)
(4 marks)

ii) Write a function called `printNumbers` which accept the `realNumbers` array as a parameter. Display 10 numbers in each row with 2 decimal places. For example:

```
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10
0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19 0.20
0.21 0.22 0.23 0.24 0.25 0.26 0.27 0.28 0.29 0.30
0.31 0.32 0.33 0.34 0.35 0.36 0.37 0.38 0.39 0.40
0.41 0.42 0.43 0.44 0.45 0.46 0.47 0.48 0.49 0.50
0.51 0.52 0.53 0.54 0.55 0.56 0.57 0.58 0.59 0.60
0.61 0.62 0.63 0.64 0.65 0.66 0.67 0.68 0.69 0.70
0.71 0.72 0.73 0.74 0.75 0.76 0.77 0.78 0.79 0.80
0.81 0.82 0.83 0.84 0.85 0.86 0.87 0.88 0.89 0.90
0.91 0.92 0.93 0.94 0.95 0.96 0.97 0.98 0.99 1.00
```

(10 marks)

(Total: 25 marks)

Question 4

(a) Explain what is meant by searching. Name the two basic searching techniques in programming.

(4 marks)

(b) Define the following structure:

i) A structure called `SmartPhone` that stores the following details:

- Phone model (e.g. Samsung Galaxy S8)
- Radiation Absorption Rate (SAR) in the measurement of watts (e.g. 1.55 watts for Samsung Galaxy S8 model).
- Year announced (e.g. 2018).

(4 marks)

ii) Declare an array called `phones` of type `SmartPhone` that can store up to `50` `SmartPhone` records. Use an appropriate constant value to define the array size.

(3 marks)

iii) Write a code fragment to assign the first record in `phones` with the following details:

Phone Model: `Apple iPhone 8 Plus`
SAR: `1.19`
Year: `2017`

(3 marks)

iv) Write and implement a function called `printHighSARPhone`. The function will accept the `phones` and array size as parameters and display all the records in `phones` where the SAR rate is more than 1.8.

(8 marks)

(c) Use the following variables, write a code fragment to open a file called payroll.txt. Write the statements to buffer the salary in the file with 2 decimal places.

```
ofstream outfile;
double salary = 8888.88;
```

(3 marks)

(Total: 25 marks)

~ The End ~