

**FINAL
ALTERNATIVE ASSESSMENT**

(COVER PAGE)

Session : April 2020

Programme : Diploma in Computer Science (DCS)
Diploma in Electrical And Electronic Engineering (DEEI)

Course : DCS1101: Programming Fundamentals

Date of Examination : 4 August 2020 (Tuesday)

Time : 12.00noon – 2.30pm Reading Time : Nil

Duration : 2 Hours 30 Minutes

Special Instructions :

Section A: This section consists of **FOUR (4)** questions. Answer **ALL** the questions. **Write ALL your answers** in the foolscap papers.

Section B: This section consists of **TWO (2)** questions. Answer **ALL** questions. **Write ALL your answers** in the separate A4 papers.

Material permitted : Non-Programmable Scientific Calculator

Materials provided : Nil

Examiner(s) : Mr Koo Lee Chun, Ms Lusiana Syaiful

Chief Moderator : Ms Ng Ruoh Ling

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

DIPLOMA IN COMPUTER SCIENCE PROGRAMME (DCS)
DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING PROGRAMME (DEEI)
DCS1101: PROGRAMMING FUNDAMENTALS
FINAL ALTERNATIVE ASSESSMENT: APRIL 2020 SESSION

SECTION A: 60 Marks

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

Question 1

- (a) Assume X is an integer variable and Y is a float variable with the value of 11 and 5.5 respectively.

Show the working steps and result for the following expression:

- (i) $10 - X/2 + Y$
- (ii) $100 * Y - \text{pow}(X-1, 2)$
- (iii) $X * \text{static_cast}\langle\text{int}\rangle(Y) \% 3$
- (iv) $\text{static_cast}\langle\text{double}\rangle(X*2) / 4 + 5.5$

(6 marks)

- (b) Write a fragment of code in C++ based on following algorithm. Include all the variables declaration in your code. (Assume product name is always do not contain spaces)

```
Prompt the user to enter product name and price

Read the product name and price from the user

Calculate the new price after 10% discount is given and
store the result to a variable

Display the product name and the new price on the screen.
```

Sample Program run :

```
Enter the product name and its price : Pencil 1.5
Pencil after discount is RM1.35
```

(5 marks)

- (c) Melody is new to programming and below is her first program that calculates and displays an area of rectangle :

```
int main(){
    int a,b,c;
    cin >> a >> b;
    if (a < 0 || b < 0)
    cout << "Incorrect data input ";
    else
    c= a * b;
    cout << "area : " << c <<endl;
}
```

Identify at least **TWO (2)** bad programming practices in the above code. Provide suggestions to Melody on how she can improve the code.

(4 marks)

Question 2

- (a) Write **FOUR (4)** different types of statements in C++ to increase the value of a variable by 1.
- (2 marks)
- (b) Identify **THREE (3)** errors in the following program that calculates and displays the average of two numbers. State the line number, error type and reason of each error.

```
1 #include <iostream>
2
3 using namespace std;
4
5 int main(){
6
7     int number1, number2;
8     float average = (number1 + number2) / 2.0 ;
9
10    cout << "Enter two numbers :" <<endl;
11    cin >> number1 << number2;
12
13    cout << "The average of number1 and number2 average";
14
15 }
```

(6 marks)

- (c) Write a fragment of code in C++ to prompt user to enter the initial balance of an e-Wallet. Then, use *loop logic structure* to allow user to enter the spending amount as many times as possible until insufficient balance in the e-Wallet. Display the remaining balance (format to 2 decimal points) of the e-Wallet at the end of the program.

Sample program run :

```
Enter initial balance of your e-Wallet :200
Enter your spending amount :20
Enter your spending amount :50
Enter your spending amount :150
Sorry. Insufficient balance.
Your e-Wallet balance is RM130.00
```

(7 marks)

Question 3

- (a) Given the following program segment :

```

1      int i = 0, value = 0;
2      while(i < 8){
3          if (i == 2 && value >5)
4              i = i + 1;
5          else if ( i % 2 == 0 )
6              i = i + 2;
7          else
8              value = value - i;
9              i = i + 3;
10     }
11     cout << "value = " << value << ",i = " << i << endl;

```

Clearly indicate the line number each step is performing and the values of the variables values or/and output after executing that step.

Present your answer in a table format as below:

Step	Line number the program execute	i	value	Output on screen (if there is any)
1	1	0	0	
2	2	0	0	
3	3	0	0	

(6 marks)

- (b) Use switch statement, write a fragment of code in C++ to display the price of a ticket based on the information given in the below table. Use the letter given in the bracket to represent the type of ticket. Display error message if invalid option is entered.

Type of Ticket	Price (RM)
Economy Class (E)	450.00
Business Class (B)	650.00
First Class (F)	999.00

(5 marks)

- (c) Write a fragment of code in C++ to perform the following:
- Declare a character array that can store up to 26 characters.
 - Use the *for* loop to assign the initial values of the array with alphabet 'A' to 'Z' in ascending order.

(4 marks)

Question 4

- (a) Write C++ statements to accomplish each of the following :
- Construct a declaration to assign an integer constant variable `day` to 7
 - Calculate sum of `x`, `y` and `z` and store into `z`
 - Calculate the remainder after `x` is divided by `y` and assign the result into `y`
 - Using one statement. Decrease the variable `x` by 1, and then subtract it from variable `total`.
 - Assign value 4 to the 4th element of an integer array `myArray`.

(5 marks)

- (b) Write a fragment of code in C++ for the following :
- Define a `struct` to present a `Point`. Each point consists of `x` and `y` coordinate (integer).
 - Define another `struct` to represent a `Circle`. Each circle consist of `radius` (double), a `center point` (`Point` data type).
 - Declare a variable of type `Circle` and assign an appropriate value to the respective members.

(5 marks)

- (c) Write a function, `FindAChar`, to find a character in a character array. The function shall receive **TWO (2)** arguments: an array of character and a character to find, then return true if the character is found in the array, otherwise, return false.

(5 marks)

SECTION B: 40 Marks

Instructions: This section consists of **TWO (2)** questions. Answer **ALL** questions. **Write ALL your answers** in the separate A4 papers.

Question 1

A food delivery company provides delivery service within the distance up to maximum of 25km. The company charges the delivery fees as below :

Distance	Fees
10km and below	RM 7.00
Every additional 1km or part thereof after in excess of 10KM	RM1.50
Note: The maximum charge for any given distance within 25KM is RM20.00,	

Write a complete C++ program that calculates and prints delivery fees report. The program shall use loop structure to prompt the user to enter the distances for each customer until 0 is entered to indicate no more customer.

The program shall print the result in tabular format and calculate the total delivery fees collected for that day. The program must use the function `calcDeliveryFees` to determine the delivery fees for each customer. Validate the distances value before calling the `calcDeliveryFees` function. Assume maximum customer per day is 50.

Sample program run:

```

Enter the distance : 10
Enter the distance : 2.5
Enter the distance : 29
Sorry, no delivery service for distance more than 25km.
Enter the distance : -2
Distance must be positive value.
Enter the distance : 15.3
Enter the distance : 17.9
Enter the distance : 25
Enter the distance : 0

Customer  Distance (km)  Delivery Fees (RM)
1          10.0           7.00
2           2.5           7.00
3          15.3          16.00
4          17.9          19.00
5          25.0          20.00
Total delivery charges : 69.00

```

(20 marks)

Question 2

Write a complete C++ program that reads a list of student records (name and score) from a text files (refer to Figure 2.1) and generate a summary report (Refer to figure 2.2) on the screen. The program shall not generate any report if no data is available for printing.

Your program shall:

- use an array (assume size 100) and c++ struct to organized the student records.
- call the readData function to read the data from a file (only read the valid score) into an array and return the number of valid record or return -1 if the input file is not available. Display the appropriate messages if no valid record or input file is available. The valid score is 0-100.
- call the generate function to print a summary report (with student name, score and grade). Refer to Figure 2.1 for the report format (score must be display in 1 decimal point). Use below criteria to determine the grade of the score.

Score	Grade
85 and above	A
70-84	B
50-69	C
Below 50	F

Figure 2.1 : Sample data for the input file :

```
Tan Ying Ying
58.5
Winson Tan Yap Sheng
-5
Neesha A/P Johan
75.1
Hussan Bin Zahir
88
Joanne Low Yuen Cheng
6.6
```

Figure 2.2 : Report format

```
DSC1101 RESULT FOR JAN 2020

Name                Score    Grade
Tan Ying Ying       58.5     C
Neesha A/P Johan    75.1     B
Hussan Bin Zahir    88.0     A
Joanne Low Yuen Cheng 6.6     F
```

(20 marks)