INTI International University & Colleges

FINAL
ALTERNATIVE ASSESSMENT

(COVER PAGE)

Session	:	**January 2021**
Programme	:	Diploma in Computer Science (DCS)
Course	:	**DCS1101: Programming Fundamentals**
Date of Examination	:	6 March 2021 (Saturday)
Time	:	12.00noon – 2.30pm 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.

Material permitted :
Non-Programmable Scientific Calculator

Materials provided :
Nil

Examiner(s)	:	**Nadhrah Binti Abdul Hadi, Lusiana Syaiful**
Chief Moderator	:	Koo Lee Chun

*This paper consists of **8** printed pages, including the cover page*

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

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

Question 1 (25 marks)

a) Convert the following mathematic expressions into C++ language:

i. $\frac{2(r^2 + s)}{r - s} + \frac{1}{p + q}$

(2 marks)

ii. $\frac{r^2}{s^2 - r + 3} + \frac{p + q}{p - q}$

(2 marks)

iii. $\frac{r}{\sqrt{p + q}} + \sqrt[5]{p - q}$

(2 marks)

iv. $\frac{r}{s}\left(\frac{|\, p - q \,|}{\sqrt[3]{r - s}}\right) + s^{(|\, 1 - r \,|)}$

(2 marks)

v. $\frac{r^{\frac{1}{5}}}{\sqrt[s]{|\, r - s \,|}}$

(2 marks)

b) You are required to write a pseudocode and draw a flowchart for a program to determine total marks of a subject, whereby the program will obtain data from the user including the course code, marks for quiz, test and final examination. Assume the total marks is 100%, given the contribution marks are 20%, 20% and 60% for quiz, test and final examination respectively. Your program will determine whether the student passes or fails. Given the passing mark is 60% and above.

(15 marks)

Question 2 (25 marks)

a) Translate the table below into C++ program segment by using switch statement to display the price of the ticket. Use the letter given in the bracket to represent the type of ticket.

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

(5 marks)

b) You are required to write a C++ program to determine the number of students based on their weight range. First, the user must input the total number of students in the class. Next, by using looping, the user need to input the weight, in kilogram (kg), for each of the students. The program should display error message if the user input invalid weight. The program should produce the output according to the following format:

```
Range(kg)       Number of Students
Below 40                ?
41 - 60                 ?
61 - 80                 ?
81 - 100                ?
Above 100               ?
```

(20 marks)

Question 3 (25 marks)

a) Given the segment of C++ program as below:

```
int main()
{
   int quantity;
   double price, totalprice, discountRate=0.7;

   cout<<"\n Please enter the quantity of item: ";
   cin>>quantity;

   cout<<"\n Please enter the price of an item: ";
   cin>>price;

   totalprice = totalPrice(quantity, price);

   cout<<"\n The total price of items: RM ";
   cout<<setprecision(2)<<fixed<<totalprice;

   cout<<"\n Price of item after discount (70%): RM ";
   cout<<setprecision(2)<<discountPrice(totalprice, discountRate);

   return 0;
}
```

Based on the code given, you are required to answer the following questions:

i. Write the function for `totalPrice()`. The function should return the total price of items that the user have bought.

(2.5 marks)

ii. Write the function for `discountPrice()`. The function should return the discount price based on the total price.

(2.5 marks)

b) You are required to write a C++ program to store 5 names of students into an array named `name` and the marks for each student in a separate array named `mark`. Determine the status of the students' marks if the passing mark is 50. The status for each of the students need to be stored in an array named `status`. The program should display the students' name, marks and their status.

(20 marks)

Question 4 (25 marks)

a) Write the C++ statements for each of these questions:

i. Declare a `struct` name `stuRecord`. The members are `firstName`, `lastName`, `score` and `grade`. Each student enrolls in 5 subjects, hence member `score` and `grade` should be able to store 5 values.

(3 marks)

i. Create a variable name `student1` of type `stuRecord`.

(1 mark)

ii. Initialize member `firstName` and member `lastName` of variable `student1` to `Eddin` and `Josephine` respectively.

(1 mark)

b) Table 1 shows the Motorcycle Sales Report in 2018 and 2019. Based on Table 1, write a C++ program to allow the user to input the `type`, `sale2018`, and `sale2019` four times by using looping. Calculate the difference of sale between 2018 and 2019, and the percentage increase for each type of the motorcycles. Store the data in a file name "`report.txt`". The program should verify whether the file can be opened or not. The following is the formula to calculate the percentage increase:

$$Percentage\ increase = \frac{Difference}{Sales\ in\ 2018}\ x\ 100$$

Table 1 shows the output in the "`report.txt`" file.

Table 1

Type	Sale in 2018	Sale in 2019	Difference	Percentage Increase
Dual Sport	28452	32979	4527	13.73
Off Road	71536	73371	1835	2.50
Street	318105	324691	6586	2.02
Scooter	34294	27931	-6363	-22.78

(20 marks)

~THE END~

DCS1101 (F)/ January 2021 Session/ formatted