FINAL
ALTERNATIVE ASSESSMENT

(COVER PAGE)

Session	:	**August 2020**
Programme	:	Diploma in Information Technology (DITN) Diploma in Information and Communication Technology (DICTN) Diploma in Computer Science (DCS)
Course	:	**ICT2100: Object Oriented Programming**
Date of Examination	:	14 December 2020 (Monday)
Time	:	8.00am – 10.30am Reading Time : Nil
Duration	:	2 Hours 30 Minutes

Special Instructions :

This paper consists of **TWO (2) SECTIONS**. Answer **ALL** questions in **Section A** and **Section B.**

Material permitted : Nil

Materials provided : Nil

Examiner(s)	:	**Lai Kim Min,** Ng Ruoh Ling**,** Nursyarizan Mohd Akbar
Chief Moderator	:	Siti Hajar Khairuddin

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

DIPLOMA IN INFORMATION TECHNOLOGY PROGRAMME (DITN)
DIPLOMA IN INFORMATION AND COMMUNICATIONS TECHNOLOGY PROGRAMME (DICTN)
DIPLOMA IN COMPUTER SCIENCE PROGRAMME (DCS)
ICT2100: OBJECT-ORIENTED PROGRAMMING
FINAL ALTERNATIVE ASSESSMENT: AUGUST 2020 SESSION

Instructions: This paper consists of **SEVEN (7)** questions. Answer **ALL** questions in your own writing pad.

SECTION A (40%)

Question 1

Given the following code:

```
String s1="123";
String s2="123.45";
String s3="B";
int num1;
double num2;
char letter1;

//Missing code 1: convert s1 to num1
//Missing code 2: convert s2 to num2
//Missing code 3: convert s3 to letter1;
```

(a) Provide the missing codes for the conversions.

(6 marks)

(b) Use the variables `s1`, `num1` and `letter1`, produce the following output with formatted `printf` command.

```
B) "123" is not same as 123
```

(4 marks)

Question 2

(a) Convert the following if-else statements to switch case

```
if ((answer == "A") || (answer == "B"))
     bonus = bonus * 1.5;
else if (answer == "C")
     bonus =  bonus * 1.2;
else if (answer == "D")
     bonus = bonus * 1.1;
else
     bonus--;
```

(6 marks)

(b) Given the following array:

```
int list[]={3,6,6,1,4,8,9,8,7,8};
```

Write a fragment of code with a for loop to display all the array is elements which smaller than the last element.

(4 marks)

Question 3

(a) The following table is used to calculate the factor based on the given rating.

Rating	1	2	3	4	...	8	9	10
Factor	0.2	0.4	0.6	0.8	...	1.6	1.8	2.0

Write a class method called `getFactor` that accepts an integer parameter representing a rating number and return the factor value accordingly. Return a zero if the rating is not in range 1 to 10. Do not use if-else statements in deriving the factor value.

(4 marks)

(b) Create a two dimensional array called `slots` as integer type with 3 (row) X 4 (column) dimension. Use a for loop to initialize the array with random numbers in range 10 to 20 (inclusive). Hint: use `Math.random()` method in generating the random numbers.

(6 marks)

Question 4

Based on the following fragment of code, answer the following questions:

```
Ball b1 = new Ball();
Ball b2 = new Ball("Blue", 3.5);

System.out.println(b1);
//Output: The ball is blue color with radius 3.5

System.out.println(Ball.getCount()); //Output: 2
```

i) Define all the attributes of the `Ball` class.

(2 marks)

ii) Create the overloaded constructor for the `Ball` class with two arguments.

(4 marks)

iii) Implement two methods found from the above code.

(4 marks)

SECTION B (60%)

Question 5

(a) Answer the following questions:

i) Create a class name `Month` with the following members:

- an private instance variable `name` (`String`) that stores the name of a month
- an private instance variable `days` (`int`) that stores the number of days in a month
- a parameterized constructor
- getter and setter methods
- a `toString` method that returns the data of a month.

(10 marks)

ii) Write a fragment of code to create an array called `months` that use to store the `Month` objects. Assign the first month (January) object into this array.

Assume all the month objects have been loaded in the array, access the data of array using `toString` method and print them out in the following format:

```
January: 31 days
February: 28 days
:
December: 31 days
```

(4 marks)

iii) Given the following code that is accessing the object array of the class `Month`:

```
Scanner scan=new Scanner(System.in);
System.out.print("Enter the number (1-12) for a month" +
" to display the number of days in that month: ");
int num=scan.nextInt();
System.out.println(months[num-1].toString());
```

Rewrite the code so that the program can handle at least TWO possible exceptions.

(6 marks)

(Total: 20 marks)

Question 6

(a) Define an interface called `Convertible` with a method called `convert` (`String` type) with no return data.

(2 marks)

(b) Define an abstract class named `Room` that implements the interface `Convertible`. It has two private attributes `capacity` (`int`) and `size` (`String`), a parameterized constructor that initializes the attribute `capacity`. It also has a getter for attribute `size` that returns "Big" if capacity is 80 or above, else returns "Medium" if capacity is 40 or above, else returns "Small".

(10 marks)

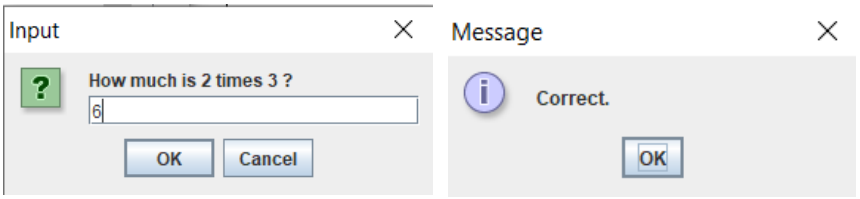
(c) Define a child class `ClassRoom` that derives from class `Room`. It has a private attribute named `type` (String) and a parameterized constructor. It overrides the `convert` method, in the method, the classroom `type` is change to the type received through the parameter.

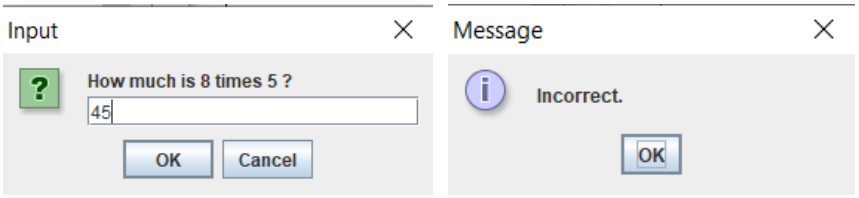
(3 marks)

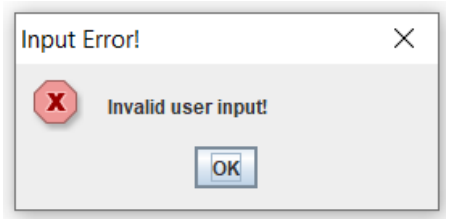
(Total: 20 marks)

Question 7

Write a complete Java program that will randomly generate two positive one-digit integers (1 to 9) and display them as a multiplication question to the user using an Input Dialog box. If the answer given by the user is correct, display the message "`Correct`". Otherwise display the message "`Incorrect`". Provide appropriate exception handling if the user input is not a valid number. Below shows the sample output:







(Total: 20 marks)

~THE END~