INTI International University & Colleges

FINAL
Examination Paper

(COVER PAGE)

Session	:	January 2017
Programme	:	Diploma In Information And Communication Technology (DICTN)
Course	:	**ICT1101: Program Logic Formulation**
Date of Examination	:	10 March, 2017 (Friday)
Time	:	5:00pm – 7:00pm Reading Time : Nil
Duration	:	2 Hours

Special Instructions :

SECTION A: Answer **ALL** multiple choice questions.

SECTION B: Answer any **THREE (3)** essay questions.

IMPORTANT NOTE : THIS PAPER SHOULD NOT BE TAKEN OUT OF THE EXAMINATION HALL

Materials permitted : Nil

Materials provided : OMR Sheets

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Moderator : Pawani T Rasaratnam

This paper consists of 9 printed pages, including the cover page

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY PROGRAMME
(DICTN)
ICT1101: PROGRAM LOGIC FORMULATION
FINAL EXAMINATION: JANUARY 2017 SESSION

Instruction: This paper consists of **TWO (2) SECTIONS.** Answer **ALL** questions in **SECTION A** and any **THREE (3)** questions in **SECTION B.**

SECTION A: Answer **ALL** questions in the OMR sheet provided. **(40 marks)**

1. _____ is the native language of a computer.

   A. Machine language
   B. Assembly language
   C. High level language
   D. English

2. A solution that cannot reach through set of steps is known as _____.

   A. Algorithmic solution
   B. Heuristic solution
   C. Infinite solution
   D. Step solution

3. Given the equation as below, which of the following statement is **INVALID** :

   X = Y AND (A + B MOD C > D * 10)

   A. A, B, C and D shall be integer or real data type
   B. MOD will be evaluated before operator +
   C. IF Y is TRUE, the value of X is TRUE regardless the initial values of A, B, C and D
   D. IF Y is FALSE, the value of X is False regardless the initial values of A, B, C and D

4. _____ is the logical operator requires only one operand.

   A. AND
   B. OR
   C. NOT
   D. >

5. _____ are memory locations in which you store information, temporarily and value is changeable throughout the program.

A. Variables
B. Constants
C. Integers
D. Stores

6. Assume X = 5, Y = 10, which of the following expression results in TRUE ?

I. X * 3 <= Y
II. X > Y OR Y <> X
III. Y > X AND Y < X * 2
IV. Y >= X * 2

A. I AND III Only
B. II AND IV Only
C. I, II AND III Only
D. I, II, III, IV

7. The _____ symbol used in a flowchart to represent a calculation task.

A. Input
B. Output
C. Process
D. Module

8. Problem Analysis Chart (PAC) consists of 4 parts. Which part of the following is presenting the know values or general name for data in the problem?

A. Given Data
B. Required Results
C. Required Processing
D. Solution Alternatives

9. In algorithms containing multiple decisions, you may have to write _____.

   I. WHILE-END Loop instructions
   II. REPEAT-UNTIL Loop instructions
   III. Nested IF instructions
   IV. Case logic instruction

   A. I, II
   B. III,IV
   C. I,II, III
   D. I, II, III, IV

10. With decision following _____, all conditions are tested.

   A. Nested IF/THEN/ELSE instruction
   B. Straight-through logic
   C. Positive logic
   D. Negative logic

11. Consider the instructions given below, what is the final value of X after the instructions executed?

```
X =10
Y = 20
X = X * 2
Y = X + 1
```

   A. 10
   B. 20
   C. 40
   D. 41

12. IF the input value of X is 20, what is the output for the below instructions :

```
ENTER X
CASE OF X+1
   =10 : Display "CASE 1"
   =20 : Display "CASE 2"
   OTHERWISE : Display "CASE 3"
END OF CASE
```

   A. CASE 1
   B. CASE 2
   C. CASE 3
   D. Nothing is displayed

13. The execution path of a _____ is determined by matching the value of a variable to a set of constants.

A. Sequential structure
B. Decision structure
C. Case structure
D. Loop structure

14. In an automatic counter loop, the instructions are repeated until _____.

A. A given condition true
B. The counter becomes smaller than the ending number
C. The counter becomes larger than the ending number
D. The counter becomes equal than the ending number

15. The variable uses to calculate the sum of a series of positive numbers must be initialized to _____.

A. 0
B. 1
C. Any positive numbers
D. Any negative numbers

16. Consider the instructions given below, what is the output and final values of X after the instructions executed.

```
X= 10
Y = 20

IF X + 2  > 10 OR Y  <= 20 THEN
     DISPLAY "PASS 1"
     X = X + 1
ELSE
     DISPLAY "PASS 2"
```

A. PASS 1. Final value of X is 11
B. PASS 1. Final value of X is 12
C. PASS 2. Final value of X is 11
D. PASS 2. Final value of X is 12

17. What does the following instructions prints?

```
X = 4
WHILE  X <= 35
        X = X * 2
        DISPLAY X
WHILE-END
```

A. 4 8 16 32
B. 4 8 16 32 64
C. 8 16 32
D. 8 16 32 64

18. When a _____ parameter used, the value of the variable is sent to the called module by calling module.

A. Call-By-Reference
B. Call-By-Value
C. Formal
D. Actual

19. A variable known only to the module in which it is declared is called a(n) _____ variable.

A. Global
B. Local
C. Procedure
D. Function

20. If you want to generate numbers by the computer, which standard function could you use?

A. MAX()
B. AVERAGE()
C. SUM()
D. RANDOM()

SECTION B: Answer any **THREE (3)** questions in the answer booklet provided. **(60 marks)**

Question 1

(a) Rewrite the following mathematical expressions in computer understandable format:

(i) $(\sqrt[4]{u+w}\ )w^3$

(ii) $\dfrac{3m+4h}{\sqrt{(x-y)}}$

(iii) $x+y^{(a-b)}$

(iv) $\left|xy-w/z\right|+k$

(v) $\dfrac{-b+\sqrt{b^2-4ac}}{2a}$

(10 marks)

(b) Provide a problem analysis chart of a solution that reads the length and the width of a rectangular yard and the length and the width of a rectangular house situated in the yard. Your program should calculate the areas of the yard that can plant the grass. (10 marks)

Question 2

(a) Outline **THREE (3)** differences between a compiler and an interpreter. (6 marks)

(b) Identify appropriate data type for the following :

(i) Total eggs collected per day in a chicken farm
(ii) Series number for a product
(iii) Profit for a company
(iv) Approval status for a loan application

(4 marks)

(c) Assume N1, N2, N3 and N4 is input by user, write a solution to determine which of the four numbers N1, N2, N3 and N4 is odd number. If the number is odd, display the number with the message " is odd". Show your solution in algorithm and flowchart.

For example, if user enters 10, 13, 15, 20 for N1, N2, N3 and N4 respectively, the solution shall display output as below:

```
13 is odd
15 is odd
```

(10 marks)

Question 3

(a) Assume the following variables contain the values shown:

numberRed = 100	numberBlue = 200	numberGreen = 300
wordRed ="rose"	wordBlue = "sky"	wordGreen = "grass"

for each of the following Boolean expression, decide whether the statement is true, false or illegal.

(i) numberBlue >= numberRed + 100
(ii) numberGreen < numberRed
(iii) numberGreen < > "green"
(iv) wordBlue = = "Blue"
(v) numberBlue <= numberGreen - numberRed (5 marks)

(b) Compare the CASE Logic Structure and Decision Logic Structure.

(5 marks)

(c) Design algorithm for the following table to display the appropriate message:

Status	Message
@	Absent with MC
X	Absent without MC
*	Barred
Others	Errors

Present your logic structures in
(i) positive logic (decision logic)
(ii) case logic.

(10 marks)

Question 4

(a) Consider the following algorithm:

```
1. Begin
2. X = 0
3. Read n
4. LOOP: count=1 TO n
         READ number
         IF number <= 0
   True  THEN
               x = x + 1
   LOOP-END: count
5. End
```

(i) Identify the types of logic structure of the algorithm. (3 marks)

(ii) Describe the scenario of the algorithm. (4 marks)

(iii) Rewrite the algorithm in REPEAT/UNTIL loop. (5 marks)

(b) Draw a *coupling diagram* for the following problem:

> A solution simulates a simple calculator.
>
> It reads two integers and a character in ValueEnter module.
>
> ValueCal module will process as: If the character is a +, calculate the sum of the two integers; if it is a -, calculate the difference of the two integers; if it is a *, calculate the product of the two integers.
>
> Display the result of the calculation in the ValuePrint module.

(8 marks)

~ The End ~