INTI International University & Colleges

FINAL
Examination Paper

(COVER PAGE)

Session	:	**JANUARY/ MARCH 2018**
Programme	:	Diploma In Information And Communication Technology (DICTN) Diploma In Information Technology (DITN) Diploma In Mechanical Engineering (DMEN) Diploma In Electronic And Electrical Engineering (DEEI)
Course	:	**ICT1101: Program Logic Formulation**
Date of Examination	:	7 March, 2018 (Wednesday)
Time	:	2:00 pm – 4:00 pm
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

Examiner(s)	:	**Yogeswari Suppiah** and Koo Lee Chun
Moderator	:	Pawani T Rasaratnam

*This paper consists of **11** printed pages, including the cover page*

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY PROGRAMME (DICTN)
DIPLOMA IN INFORMATION TECHNOLOGY PROGRAMME (DITN)
DIPLOMA IN MECHANICAL ENGINEERING PROGRAMME (DMEN)
DIPLOMA IN ELECTRONIC AND ELECTRICAL ENGINEERING (DEEI)
ICT1101: PROGRAM LOGIC FORMULATION
FINAL EXAMINATION: JANUARY/ MARCH 2018 SESSION

Section A: (40 marks)
Instruction: This section consists of **Twenty (20)** questions. Answer **ALL** questions in the OMR sheet provided.

1. Which of the following is **FALSE** about programming languages?

   A. High-level language must be translated into machine language before execution.
   B. Assembly language is the native tongue of computers.
   C. Machine language represents data and operations in binary strings.
   D. None of the above

2. Which one of the following problems must be solved with heuristic solutions?

   A. Providing directions to the nearest McDonald's.
   B. Identifying which student has the highest marks in the exam.
   C. Choosing which stocks to buy that will provide the largest profit.
   D. Selecting the cheapest phone to buy from a store.

3. _____ provides a graphical representation of an algorithm.

   A. Problem analysis chart
   B. IPO chart
   C. Interactivity chart
   D. Flowchart

4. What are the required data in PAC for the following problem :
   Design a program to calculate area for a rectangle.

   I. Area
   II. Length
   III. Width

   A. I and II Only
   B. II and III Only
   C. I, II and III
   D. None of the above

5. What is the possible output printed from statement below?

```
x = 10
total = 1 + 2 * ( 1\x * 3)
display total
```

A. 0
B. 1
C. 1.6
D. 7

6. Which one of the following data type's value is **INCORRECT**?

A. Numeric – 56.9
B. Character – '@'
C. String – "Hello, World!"
D. Logical – AND/OR

7. Identify the most suitable logic structure to solve the following problem:

Bob wants to decide if he wants to buy a Proton Saga or a Perodua Myvi. He wants to buy the cheapest option. Currently Proton Saga (RM20,000) is having a 30% discount whereas Perodua Myvi (RM30,000) is having a 30% discount. Write a solution to calculate the price for the cars and print the name of the cheapest car.

A. Sequential logic
B. Repetition logic
C. Decision logic
D. Case logic

8. The following program shall display "Even" if a number entered by user is even. What shall be filled in on the blank ?

```
Read num
IF _____
   display "Even"
```

A. num == "even"
B. num \ 2 == 0
C. num MOD 2 == 0
D. num / 2 == 0

9. If X = 15, what is the output for the following instructions

```
X=X+5
Y=12+X
IF (Y > 20)
     DISPLAY "G"
ELSE
     DISPLAY "H"
END-IF
IF (X MOD 10 <> 0)
     DISPLAY "I"
END-IF
```

A. G
B. G,I
C. G, H
D. G,H,I

10. If X < Y is true, then _____ is always false.

A. X > Y
B. X >= Y
C. X <= Y
D. Y > X

11. What is the output for the following program :

```
X = 10
IF (X > 20)
     DISPLAY "STEP 1"
ELSE IF X > 10
     DISPLAY "STEP 2"
ELSE
     DISPLAY "STEP 3"
END-IF
```

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

12. Determine the output based on algorithm below.

```
Case Of 12 MOD 4
      = 0:
           Display "The answer is 0"
      = 1:
           Display "The answer is 1"
      = 3:
           Display "The answer is 3"
      = 5:
           Display "The answer is 5"
End-Of-Case
```

A. The answer is 0
B. The answer is 1
C. The answer is 3
D. The answer is 5

13. What is the final value of Z after executing the following algorithm ?

```
x = 2
y = 5
z = 1
Case Of x * y
  = 2 : Z = Z + 1
  = 5 : Z = Z + 2
  = 7 : Z = Z + 3
  OTHERWISE : Display Z
End-of-Case
```

A. 1
B. 2
C. 3
D. 4

14. _____ repetition logic also named as post condition loop.

A. while
B. repeat until
C. automatic counter
D. none of the above

15. How many iteration for the following repetition logic?

```
X = 10
While X > 2
   X = X - 2
While-End
```

A. 1
B. 2
C. 3
D. 4

16. What is the output for the following algorithm ?

```
X = 10
While X <= 20
   Case of X
     = 15 : DISPLAY X
     = 20 : DISPLAY X * 2
   End-of-Case
   X = X + 1
While-End
```

A. 15
B. 20
C. 15 20
D. 15 40

17. What is final value of X for the following algorithm ?

```
X = 10
REPEAT
   X = X - 1
UNTIL X < 5
```

A. 2
B. 3
C. 4
D. 5

18. Which of the following are the characteristics of global variables?

I. Their values can be used and changed by any module in the program anytime.
II. They are declared outside the module.
III. The variables will be deleted from computer memory when its module ends.

A. I and II Only
B. II and III Only
C. I, II and III
D. None of the above

19. What is the final value of X and Y for the following program ?

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

A. X=12, Y=34
B. X=12, Y = 32
C. X=10, Y = 34
D. X=10, Y = 32

20. Which of the following logic can be rewrite in decision logic.

A. Sequential Logic
B. Case Logic
C. Repetition Logic
D. None of the above

Section B: (60 marks)
Instruction: This section consists of **FOUR (4)** questions. Answer any **THREE (3)** questions in the answer booklet provided. All questions carry equal marks.

Question 1

(a) Convert the following mathematical operation into a form that is readable by the computer.

(i) E = 18A + 42 ÷ (9+B)

(ii) $Y = \frac{8(A+B)^2}{(C-D)^2}$

(iii) T = X – 2Y MODULOS 3 + 5

(6 marks)

(b) Present the following condition as computer logical expression :

(i) Y is strictly between 2 and 5 (Exclusive of 2 and 5)

(ii) Both A and B are even number

(iii) Medical code is 'P' or Balance more than 5000

(6 marks)

(c) Bob wants to calculate his body mass index (BMI). He has a height of 1.75m and weight of 80kg. The standard equation to calculate a person's BMI is:

$$BMI = Weight/(Height \times Height)$$

Represent the solution for this problem in terms of a problem analysis chart (PAC) and a flowchart.

(8 marks)

Question 2

(a) Discuss the TWO (2) differences between compiler and interpreter

(4 marks)

(b) Convert the following algorithm into flowchart:

```
IF code MOD 4 = 0  Then
        Display code, " is in Group A"
END-IF
IF code MOD 4 = 1  Then
        Display code, " is in Group B"
END-IF

IF code MOD 4 = 2  Then
        Display code, " is in Group C"
END-IF

IF code MOD 4 = 3  Then
        Display code, " is in Group D"
END-IF
```

(8 marks)

(c) By referring to the table below, present a solution to determine and display the total charge based on the number of item taken by a customer. Present your solution in an algorithm

	Rate
First 10^{th} pieces	RM1.50 per pieces
Next additional 15 pieces	RM 1.20 per pieces
26^{th} pieces and above	RM 0.90 per pieces

(8 marks)

Question 3

(a) Briefly explain the differences between Repeat Until and While logic structure.

(4 marks)

(b) Present an algorithm that will read several numbers from user input. The first number read indicates the remaining numbers of input. Calculate the sum of all the numbers read and display the result. You are required to use repeat-until loop in your answer.

For example,
How many number to be entered? 4
Enter number: 200
Enter number: 90
Enter number: 8
Enter number: 22
Sum = 320

(8 marks)

(c) Present 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 structure using case logic structure.

(8 marks)

Question 4

(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, identify 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) 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)

(c) Represent 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 ~