INTI International University & Colleges

FINAL
Examination Paper

(COVER PAGE)

Session	:	**AUGUST 2018**
Programme	:	Diploma In Information And Communication Technology (DICTN) Diploma In Information Technology (DITN) Diploma In Mechanical Engineering (DMEN)
Course	:	**ICT1101: Program Logic Formulation**
Date of Examination	:	10 December 2018, (Monday)
Time	:	11:00am – 1:00pm 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

Examiner(s) : **Koo Lee Chun** and Yogeswari Suppiah

Moderator : Pawani T Rasaratnam

*This paper consists of **10** 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)
ICT1101: PROGRAM LOGIC FORMULATION
FINAL EXAMINATION: AUGUST 2018 SESSION

SECTION A: 40 marks

Instruction: This section consists of **TWENTY (20)** questions. Answer **ALL** questions in the OMR sheet provided. All questions carry equal marks.

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

   I. High-level Language must be translated into machine language before execution.
   II. Assembly Language represents data and operations in binary strings.
   III. Machine Language is the native tongue of computers.
   IV. C++ and Java is an example of Assembly Language

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

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

   A. Providing directions to the nearest McDonald's.
   B. Guiding an investor to buy the best stock
   C. Identifying which student has the highest marks in the exam.
   D. Selecting the cheapest phone to buy from a store.

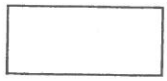
3. Which of the following statement is **INCORRECT**?

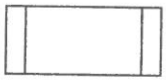
   I. With runtime error, the program can be executed but produced incorrect result
   II. Only 1 or 0 are the valid data for a constant
   III. A variable may only change its value when the code is changed.
   IV. A compiler scans the whole program and translate into machine language at once.

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

4. Which of the following symbol represents an module in flow chart?

A. 

B. 

C. 

D. 

5. Which of the following data items shall be assigned to integer data type ?

I. Total books in a library
II. Contact Number
III. Number of students in a class
IV. Price for 1 liter of petrol

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

6. _____ processes instructions that are executed only once during the program, and only at the beginning such as opening file.

A. Init module
B. Control module
C. Process Data module
D. Wrap-up module

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

```
begin
   x = 5
   y = 10
   y = x + 2
   x = x * y
end
```

A. 35
B. 50
C. The statements unable to execute due to run time error at `x = x * y`
D. None of the above

8. Which of the following has Invalid logic ?

   A. Enter salary
      newSalary = salary * 1.05
      Display newSalary

   B. Enter counter
      counter = counter + 1
      Display counter

   C. Read base,height
      Display Area
      Area = 1/2 * base * height

   D. Enter price, discountedRate
      discountedAmt = price * discountedRate

9. IF the input value of X is 7 , what is the output for the instruction below :

```
ENTER X
CASE OF X-2
   =5 : Display "CASE 1"
   =7 : Display "CASE 2"
   OTHERWISE : Display "CASE 3"
END OF CASE
```

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

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

   A. 0
   B. 1
   C. Any even numbers
   D. None of the above

11. Which of the following statement is valid for the logical expression given below ?

```
result= X AND NOT Y OR Z
```

   A. If X is True, the result always True regardless the value of Y and Z
   B. If X is False, the result is False regardless the value of X and Y
   C. If X and Z is True, the result is True regardless the value of Y
   D. If X and Z is False, the result is False regardless the value of Y

12. What does the following instructions prints?

```
X = 25
WHILE  X >=17
     X = X - 2
     DISPLAY X
WHILE-END
```

A. 23 21 19 17
B. 23 21 19 17 15
C. 25 23 21 19 17
D. 25 23 21 19 17 15

13. Which of the following statements about Global Variable is ***Invalid***.

A. Global variables and local variables are not allowed to have the same name.
B. A global variable can be accessed by all modules.
C. The use of return values and parameters are not necessary since the global variable is accessible by all.
D. Global variables are defined outside of any individual module.

14. What is the output for the following program:

```
X=10
Y=20

IF X <= 10 THEN
   IF Y < 20 THEN
      DISPLAY "PASS1"
   END-IF
ELSE
   X = X + Y
END-IF
DISPLAY "FINAL"
```

A. PASS1, follow by FINAL
B. PASS1
C. FINAL
D. Nothing is displayed

15. Which of the following is an INVALID variable name?

A. Number_1
B. number1
C. First Number
D. _1stNumber

16. Which of the following is(are) **VALID** Computer expression ?

I. A + 7D
II. A\ B * C
III. (A+B)(C+D)
IV. C MOD 100

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

17. Consider the instructions given below, what is the final value of Y after the instructions executed?

```
X = 2
IF  X + 1 < 3  THEN
     Y = 10
ELSE
  IF X < 7 THEN
     Y = 15
  ELSE
     Y = 20
  END-IF
END-IF
```

A. 2
B. 5
C. 15
D. 20

18. How many times the Display counter instruction is processed?

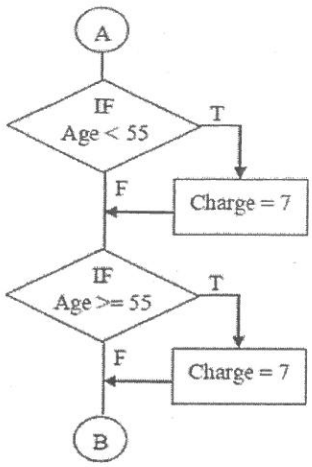
```
Counter = 20
REPEAT
   Counter = Counter - 2
   Display Counter
UNTIL Counter <= 10
```

A. 4
B. 5
C. 6
D. 7

19. _____ loop will always execute at least once in the loop body.

A. While
B. Repeat /Until
C. Automatic-counter
D. All of the above

20. The diagram below illustrates which type of logic structure?



A. Positive logic
B. Negative logic
C. Case logic
D. Straight-through logic

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) Assume A = 1, B = 2 and C = 3, evaluate by showing the working step for the following equation :

(i) X = A – 2*(B+C)
(ii) X= (C+2) \ B * (B+C) MOD 3
(iii) X = A^2 – $B * C$

(6 marks)

b) Discuss **TWO (2)** differences between compiler and interpreter.

(5 marks)

c) Employees are entitled for petrol allowance when travelling by using their own transportation. They can claim RM0.50 per km for the first 10km, RM0.40 per km thereafter with a maximum claim of 100km per day.

Design a solution to calculate the total petrol allowance based on distance entered by the user. Present your answer in a Problem Analysis Chart (PAC).

(6 marks)

d) Rewrite the following expression into computer expression:

(i) $Y = 7a - b \div 6^c$
(ii) $y = \frac{\sqrt{b^2 - ac}}{d}$

(3 marks)

Question 2

a) In order for a student to student to be considered as a Head Boy/Girl, they must fulfill several criteria. For each of the following conditions, set up a logical expression that will evaluate it:
(i) The student must have an average grade of 90 or above.
(ii) The student must receive recommendations from more than 5 different teachers
(iii)The student must be a prefect.
(iv)The student must pass his English language. The passing marks is 50 and above.

(8 marks)

b) Infinite loop is a sequence of instructions in a computer program that repeat endlessly. Design an algorithm that shows how an infinite loop occur using repetition logic.

(4 marks)

c) You are served hot tea. Every time you blow on it the temperature reduces by 10%. Use a while loop to design a solution that calculate how many blows are needed to bring the tea down from 100 degrees Celsius to 70 degrees Celsius. Present your solution in flowchart.

(8 marks)

Question 3

a) Draw a coupling diagram for the following problem:

> Write the ***dataEntry*** module to read travelDate, duration and type of room
>
> Write the ***CalAccommodation*** module to calculate total of accommodation charges based duration and type of room
>
> Write the ***CalTransportation*** module to determine total of transportation fees based duration.
>
> Write the ***printSummary*** module to print a report consists of travel Date, accommodation charges, transportation fees and total travelling cost (accommodation charges + transportation fees)

(8 marks)

b) A travel package is sold with full price for adult and 20% for a child below 12 years old. Additional discount (on the total package cost) is offered for those members who booked the travel package using the following membership card:

- 15% for Gold membership card (code: G)
- 10% for Silver membership card (code: S)

Use the case logic to design a solution that calculate the total package cost based on the travel package price, membership card type, total quantity travel package sold for adult and child.

(8 marks)

c) Besides Integer data type, briefly explain **FOUR (4)** common data type.

(4 marks)

Question 4

a) Discuss **THREE (3)** differences between pre-condition loop and post-condition loop. Provide an example for each.

(9 marks)

b) A leap year has one extra day in February. A year can only be leap if it is divisible by 4. However, if it is also divisible by 100 then it is leap only when divisible by 400 as well. Design a solution to ask a user for a year and tell the user if it is leap. Present your solution in an algorithm.

(9 marks)

c) Correct the following sequential logic:

```
Start
    Display Total
    Total = A + B
     Read A,B
End
```

(2 marks)

~THE END~

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