



FINAL
Examination Paper

(COVER PAGE)

Session : April 2014

Programme : Diploma In Information And Communication Technology (DICTN)

Course : ICT1101 : Program Logic Formulation

Date of Examination : July 23, 2014

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) 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 : Ms. Jane Lim See Yin

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

INTI INTERNATIONAL COLLEGE SUBANG

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY
(DICTN/DICTI/DMEI)

ICT1101: PROGRAM LOGIC FORMULATION
CSC1101: PROGRAM LOGIC FORMULATION
FINAL EXAMINATION: APRIL 2014 SESSION

SECTION A : (40 marks)

Instructions: This section consists of **Twenty (20)** questions. Answer **ALL** questions in the OMR sheet provided.

1. A(n) _____ translates each high-level language statement into machine language and executes it immediately before the next statement is examined.
 - A. compiler
 - B. interpreter
 - C. assembler
 - D. translator
 - E. All of the above

2. A programming language is a set of instructions consisting of _____.
 - A. rules
 - B. syntax
 - C. numerical and logical operators
 - D. utility functions
 - E. All of the above

3. Suppose that x, y and z are integer variables, and $x=10$, $y=10$, and $z=20$. All the following expressions evaluate to true **EXCEPT**:
 - A. $x \leq y$
 - B. $x < 5$ OR $y > 3$
 - C. $z > x$ AND $y \geq 10$
 - D. NOT ($x > 5$)
 - E. $x + y \geq z$

4. Suppose that x, y and z are integer variables. What value is assigned to each of these variables after all the Statements are executed?

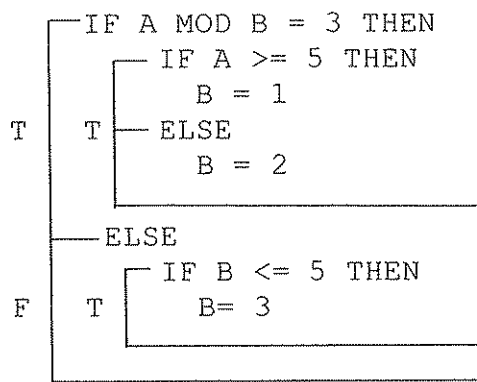
```
x = 10
y=6
z = 7
y = x - z
z = 2 + y * 3
```

- A. x=10, y=6, z=7
B. x=10, y=6, z=11
C. x=10, y=6, z=20
D. x=10, y=3, z=15
E. x=10, y=3, z=11
5. Following data items can be assigned to numeric data type **EXCEPT**:
- A. number of students
B. quantity of pencils
C. telephone number
D. school fees
E. exam mark
6. Which of the following is the statistical function?
- A. SQRT
B. INTEGER
C. RANDOM
D. ROUND
E. AVERAGE
7. Which of the following shows the **CORRECT** sequence of the organizational tools that a programmer may use to solve a problem?
- A. PAC, Structure Chart, IPO, Algorithms, Flowchart
B. Flowchart, Structure Chart, IPO, PAC, Algorithms
C. Algorithms, PAC, IPO Structure, Flowchart
D. IPO, Structure Chart, PAC, Algorithms, Flowchart
E. Structure Chart, IPO, PAC, Algorithms, Flowchart

8. Which of the following statement is TRUE?

- A. Functions are small sets of instructions that perform specific tasks and return values.
- B. Value of a constant can be changed once it has been set, value of a variable cannot be changed once it has been set.
- C. Assembly language is the native tongue of a particular computer.
- D. Cohesion allows modules to be connected by an interface, which enables the programmer to transfer data from one module to another.
- E. None of the above.

9. In the following algorithm, what value is assigned to B if A = 12 and B = 5?



- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

10. _____ are local variables that are pass from one module to another and it allows communication between the involved modules.

- A. Passing variables
- B. Lists
- C. Parameters
- D. Module variables
- E. None of the above

11. Following are the four basic parts of a decision table **EXCEPT**:
- A. conditions
 - B. counters
 - C. the combination of TRUE and FALSE for the condition
 - D. the action to be taken or consequences for each combination of conditions
 - E. None of the above

12. Consider the following algorithm :

```

Y= 1
┌ LOOP: X = 1 TO 10 STEP 2
│     Y= Y + X;
└ LOOP-END: X

```

What is the final value of Y for the above algorithm?

- A. 1
 - B. 5
 - C. 10
 - D. 26
 - E. 54
13. Modules are couple through the use of _____.
- A. global variables
 - B. module name
 - C. parameters
 - D. B and C
 - E. A, B and C
14. Which of the following expression is suitable to determine a number is an odd value?
- A. $\text{number} - 2 \neq 0$
 - B. $\text{number} \setminus 2 \neq 0$
 - C. $\text{number} / 2 \neq 0$
 - D. $\text{number} \text{ MOD } 2 \neq 0$
 - E. $\text{number} * 2 \neq 0$

15. The conversion of logic type from positive logic to negative logic requires the conversion of the relational operators used. Which of the following pair of logic conversion is **INCORRECT**?

	Original	Change to
A.	>	<
B.	=	<>
C.	<>	=
D.	<=	>
E.	<	>=

16. Consider the following algorithm:

```

CASE OF vType
  = 'G' : X = 10
  = 'B' : Y = 60
  OTHERWISE : DISPLAY "Invalid input"
END-OF-CASE

```

Which of the following statements is **TRUE**?

- A. The Case Logic Structure test the value of X and Y in order to decide what action to take.
- B. The Case Logic Structure does nothing unless vType is 'G' or 'B'
- C. If vType is 'G', X is set to value 10 and Y is set to 60
- D. if vType is 'B', X remain unchanged and Y is set to 60
- E. The Case Logic Structure is unable to rewrite in Decision Logic Structure
17. Which of the following instruction(s) **DO(ES) NOT** change the value of X ?

- I. $Y = X + 1$
- II. $X = X + Y$
- III. $Y = \text{SQRT}(X)$
- A. I. Only
- B. I and II Only
- C. I and III Only
- D. I, II and III
- E. None of the above

18. Which of the following is constant?
- The temperature outside your house
 - The number of square feet in a room that is 12 ft. by 12 ft.
 - The noise level at a concert.
 - The price of a dozen donuts is from \$2.50 to \$3.00
 - None of the above
19. Which of the following operators are arranged in the correct precedence?
- (), <, MOD, +, -
 - >=, AND, *, /
 - OR, *, /, +, <>
 - *, +, >=, NOT
20. Below is a flowchart symbol of _____.



- Process
- Input / Output
- Decision
- Processing Module
- End/Exit

SECTION B : (60 marks)

Instructions: This paper consists of **FOUR (4)** questions. Answer any **THREE (3)** questions in the answer booklet provided. All questions carry equal marks.

Question 1

- (a) Differential between algorithmic and heuristic solution. Provide an example to support your answers. (6 marks)
- (b) Assume $X=8$, $Y=6$, $Z=2$. Evaluate the following equations. Show the order of processing in the step. (4 marks)
- $Q = X * Z / (X + Y)$
 - $Q = X < Y \text{ AND } X * Y > Z + 3$

- (c) Design a solution in the form of **problem analysis chart (PAC)** to the program that reads in a number of cents and write out the number of dollars and cents.

Sample input and output:

Input the cents: 324

That is 3 dollars and 24 cents.

(10 marks)

Question 2

- (a) Design a program that calculates and prints the bill for a cellular telephone company. The company offers two types of service: regular and premium. Their rates are vary and depending on the type of service. The rates are computed as follows:

Type of Service	Service Code	Charges
Regular	R	RM15.00 plus : RM0.20 per minutes for first 50 minutes. RM0.10 per minutes for subsequent minutes.
Premium	P	RM25.00 plus : RM0.10 per minutes for first 75 minutes. RM0.05 per minutes for subsequent minutes.

The program shall prompt user to enter a service code and the number of minutes the service was used. For invalid code entered, display an appropriate error message.

Present your solution in **flowchart**. Your design shall use at least **ONE (1)** Case Logic Structure. (12 marks)

- (b) Define the data types for the following items. Justify your answers.
- (i) Number of sibling in a family
 - (ii) Minimum amount due for a credit card
 - (iii) Loan application approval check
 - (iv) Student matriculation number

(8 marks)

Question 3

- (a) Differential between WHILE-END and REPEAT-UNTIL loop. Write an example of algorithm for each case to support your answer. (8 marks)

- (b) Write an **algorithm** for a program that will continue reading a number as long as the number entered is greater than the preceding one. The program will terminate if the number is less than equal to the preceding one and display the sum of the numbers already entered.

Sample input and output:

```
Enter a number: 20
Enter next number: 30
30 is greater than 20
Enter next number: 50
50 is greater than 30
Enter next number: 15
15 is not greater than 50
Sum of the numbers entered is 100
```

(12 marks)

Question 4

- (a) Develop a coupling diagram for Grade Generation program based on following module requirements:

Modules	Description
readScores	This module reads in score for three different subjects.
calcTotal	This module calculates total mark for three subjects.
calAverage	This module calculates the average mark based on total produced by calcTotal module.
determineGrade	This module determines overall grades based on average mark produced by calAverage module
DisplayResult	This module lists total, average marks. Besides that, the module also display appropriate message based on the grade generated.

(10 marks)

- (b) Briefly explain the following modules:

- (i) Init module
- (ii) Validation module
- (iii) Calculation module

(6 marks)

- (c) Develop a **truth table** for the following :

$$Z = X \text{ AND NOT } Y$$

(4 marks)

- The End -

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