



**FINAL**  
Examination Paper

(COVER PAGE)

Session : April 2013

Programme : Diploma In Information And Communication Technology (DICTN)

Course : ICT1101 : Program Logic Formulation

Date of Examination : July 30, 2013

Time : 2:00pm – 4:00pm 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

Examiner (s) : Ms. Annida Said, Shee Fui Chie.

Moderator : Ms. Kavitha Sivashanmugam

This paper consists of 8 printed pages, including the cover page.

## NTI INTERNATIONAL COLLEGE SUBANG

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY PROGRAMME  
(DICTN)  
ICT1101 : PROGRAM LOGIC FORMULATION  
FINAL EXAMINATION : APRIL 2013 SESSION

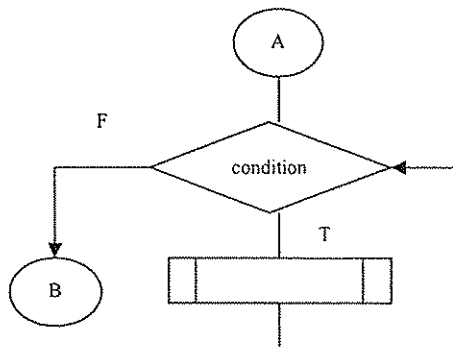
**SECTION A : 40 marks**

**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 variable names is *invalid*?
  - (A) Gr02x
  - (B) B\_high
  - (C) 4Star
  - (D) BigBook
  - (E) L
  
2. Among the problem solving steps, in which step is the solution designed?
  - (A) Step 2 – Understand the problem
  - (B) Step 1 – Identify the problem
  - (C) Step 3 – List all possible solutions
  - (D) Step 4 – Select the best solution
  - (E) Step 5 – List the step-by-step instruction
  
3. Programmers use a \_\_\_\_\_ to show program modules graphically.
  - (A) Structure chart
  - (B) Problem analysis chart
  - (C) Control structure
  - (D) Flowchart
  - (E) Algorithm
  
4. A \_\_\_\_\_ tells the program which action to take, based on a certain condition.
  - (A) Sequence logic structure
  - (B) Loop logic structure
  - (C) Decision logic structure
  - (D) All of the above
  - (E) None of the above
  
5. A program to calculate the total of n input numbers can be best solved using \_\_\_\_\_.
  - (A) Sequence logic structure
  - (B) Decision logic structure
  - (C) Loop logic structure
  - (D) Case logic structure
  - (E) All of the above

6. Select the **TRUE** statement about a constant.
- (A) Its value must always be set inside the program code.
  - (B) Its value is changeable.
  - (C) The data type of a constant is integer only.
  - (D) It is a value stored in a computer memory location.
  - (E) It doesn't have a name to represent its value.
7.  $54 \underline{\hspace{1cm}} 7 = 7$ . Which arithmetic operator can replace the blank to make the statement correct?
- (A) \*
  - (B) /
  - (C) \
  - (D) ^
  - (E) MOD
8. What is **NOT** shown in the coupling diagram?
- (A) The step-by-step instruction on how each module is performed.
  - (B) The parameters sent from one module to another
  - (C) The parameters received by one module from another
  - (D) The interaction between two modules
  - (E) The parameter that couples modules, either value or address
9. To test a condition means to process a condition to get a \_\_\_\_\_ resultant.
- (A) Positive or Negative
  - (B) Big or Small
  - (C) Greater or Smaller
  - (D) High or Low
  - (E) True or False
10. The following are the characteristics of local variables *except* :
- (A) They are declared in a module.
  - (B) Their values can be used and changed by any module in the program.
  - (C) The variables will be deleted from computer memory when its module ends.
  - (D) Their variable name can be the same as other local variables in different modules.
  - (E) None of the above.
11. With a logic error, the program can be \_\_\_\_\_ (supposing there are no other errors), but produces the wrong answer when executed.
- (A) Executed
  - (B) Ran
  - (C) Compiled
  - (D) Interpreted
  - (E) All of the above

12. Parameter is a variable that \_\_\_\_\_.
- (A) Has more than one value.
  - (B) Is used only in the main function.
  - (C) Is sent to a module by another module.
  - (D) Cannot change its value.
  - (E) Is shared by all modules.
13. The Case Logic Structure replaces a multiple nested IF/THEN/ELSE instruction that uses positive logic and the relative operator \_\_\_\_\_.
- (A) Less Than
  - (B) Not Equal
  - (C) Greater Than
  - (D) Equal
  - (E) More Than And Equal To
14. Which is the correct expression for the following statement?  
 “marks that is not in the range of 1-100”
- (A) `mark < 1 AND mark > 100`
  - (B) `mark > 1 AND mark < 100`
  - (C) `mark < 1 OR mark > 100`
  - (D) `mark > 1 OR mark < 100`
  - (E) `mark <= 1 OR mark >= 100`
15. What is the type of the control structure of following flowchart?



- (A) REPEAT/UNTIL loop
- (B) IF/THEN/ELSE
- (C) WHILE/WHILE-END loop
- (D) CASE logic structure
- (E) Automatic-counter loop

16. Modules are coupled through the use of \_\_\_\_\_.
- (A) Global variable
  - (B) Parameters
  - (C) Module name
  - (D) A and B
  - (E) A, B and C
17. Which of the following is the standard library for a C++ code?
- (A) `cmath`
  - (B) `iostream`
  - (C) `string`
  - (D) `stdlib`
  - (E) `iomanip`
18. A loop within a loop, an inner loop within the body of an outer one is called \_\_\_\_\_.
- (A) Pre-conditioned loop
  - (B) Post-conditioned loop
  - (C) Nested loop
  - (D) Automatic-counter loop
  - (E) None of the above
19. The following items are identified in data dictionary *except* :
- (A) The variable names
  - (B) The related module names
  - (C) The variable scope
  - (D) The module reference numbers
  - (E) The data type
20. The following keywords are used in looping *except* :
- (A) `while`
  - (B) `do`
  - (C) `for`
  - (D) `switch`
  - (E) 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) Variables can declare with different *data types*. List and describe **TWO (2)** predefined data types.

(6 marks)

- (b) Determine the output of the following code segment.

```
int x = 2, y = 3;

x = y + 2;
cout << x;
cout << y;

y = y + 1;
cout << (x - y);

x = x + 1;
y = 2 * x;
cout << y;
```

(4 marks)

- (c) Write the logic notation for the mathematical expression below:

$$(i) \quad Q = \frac{M^{20(2m)} + 20}{AB}$$

$$(ii) \quad Q = \frac{M}{2} + (BC)^2 \text{MOD } 2$$

$$(iii) \quad Q = \frac{(AB)^2 + (BC)^2}{200}$$

$$(iv) \quad Q = A^2 + B^4(200M)$$

$$(v) \quad Q = \frac{-b + \sqrt[3]{b^2 - 4ac}}{2a}$$

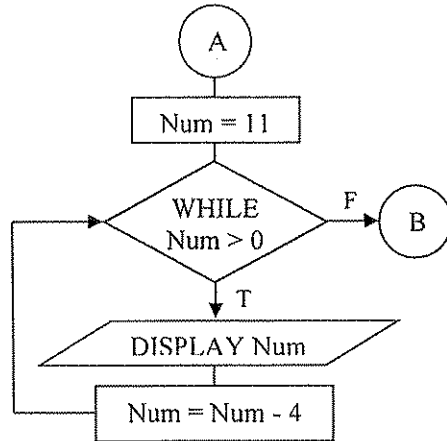
(10 marks)

## Question 2

- (a) Build the *truth table* of all possibilities for the following logical expression :  
 $X = A \text{ OR NOT } (C \text{ AND } B) \text{ AND NOT } C$

(7 marks)

- (b) Determine the *output* of the following flowchart.



(3 marks)

- (c) Write an *algorithm* to find how many soft water balls can fit into a rectangular box of any size. On average the diameter of the ball is 10cm.  
 [volume of ball =  $A = \frac{4}{3}(\pi r^3)$ ]

(10 marks)

## Question 3

- (a) Rewrite the following algorithm to use a Case Logic Structure:

```

IF choice = 1 THEN
  DISPLAY "The choice was 1"
ELSE
  IF choice = 2 THEN
    DISPLAY "The choice was 2"
  ELSE
    IF choice = 3 THEN
      DISPLAY "The choice was 3"
    ELSE
      DISPLAY "The choice was not 1, 2, or 3"
    ENDIF
  ENDIF
ENDIF
ENDIF
  
```

(10 marks)

- (b) In a solution, user is required to provide 100 upper case letters. Draw the *flowchart* to determine and display the number of vowels entered by the user. You must use *automatic-counter loop* in your answer. (10 marks)

**Question 4**

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

Write the Read module to read a set of three numbers.

Write the Calculation module to choose the largest number from the numbers entered.

Write the Print module to display the largest number.

(10 marks)

- (b) Design a solution that will request user to enter a number between 1 and 5. Prompt welcome message if the number is between 1 and 5, otherwise display error message. End the input if user enters 9999. Present your solution in *input-process-output chart*. (10 marks)

--THE END--  
ICT1101 / (F) / April2013