

FINAL
Examination Paper

(COVER PAGE)

Session : August 2016

Programme : Diploma In Information And Communication Technology (DICTN)
Diploma In Mechanical Engineering (DMEN)
Diploma In Electrical & Electronic Engineering (DEEL)

Course : **ICT1101: Program Logic Formulation**

Date of Examination : 05 December, 2016 (Monday)

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)
DIPLOMA IN MECHANICAL ENGINEERING PROGRAMME (DMEN)
ICT1101: PROGRAM LOGIC FORMULATION
FINAL EXAMINATION: AUGUST 2016 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. The following are the characteristics of compiler *except* _____.
 - A. source code is needed to run the program every time.
 - B. takes entire program and converts it into object code which is typically stored in a file.
 - C. run very quickly because no translation is required while the program is executing.
 - D. translate the program directly into code that is specific to the target machine.

2. Which of the following is an integer?
 - A. "123"
 - B. 45.7
 - C. -987
 - D. '5'

3. Running out of memory will often cause a _____.
 - A. syntax error.
 - B. logical error
 - C. run-time error.
 - D. system error.

4. _____ is a logical operator.
 - A. Not
 - B. =
 - C. <>
 - D. \

5. What result is produced by the logic expression shown below if the value of x is 22?

$$x < > 11 \text{ OR } x \setminus 11 = 2 \text{ AND } x \text{ MOD } 30 = 0$$

- A. 1
 B. 11
 C. True
 D. False
6. The algorithms pull the _____ and the _____ together to give a logical step-by-step solution.
- A. problem analysis chart, structure chart
 B. structure chart, input-process-output chart
 C. problem analysis chart, input-process-output chart
 D. input-process-output chart, flowchart
7. In the problem analysis chart, any equations would be entered under _____.
- A. given data
 B. required results
 C. processing required
 D. solution alternative
8. In most solution, the _____ controls the processing of the solution.
- A. control module
 B. initialize module
 C. read module
 D. wrap-up module
- 9.



Identify the representation of the above flowchart symbol.

- A. processing
 B. automatic-counter loop
 C. off-page connector
 D. process module

10. The following describes the scope of local variables except _____.

- A. may be used only by the module itself.
- B. allow data coupling through the entire program.
- C. allow cohesion to take place.
- D. no worry about the variable name duplication.

11. Identify the logic structure(s) to solve the following problem:

A sweater is on sale for 25% off the original price if the customer buys the second item. The original price is \$50. Write a solution to calculate and print the sale price.

- I. Sequential logic
- II. Decision logic
- III. Case logic
- IV. Repetition logic

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

12. Positive logic allows the flow of the processing continues when the resultant of a decision is _____.

- A. yes
- B. no
- C. true
- D. false

13. Which of the following you would use case logic structure?

- A. month has the average temperature of 30.5.
- B. cost of the car given 10 models.
- C. month of 30 days.
- D. grade for the test score.

14. What is the logic expression for the following statement?

The size is not M or L

- A. size <> 'M' AND size <> 'L'
- B. size <> M OR L
- C. size <> 'M' OR 'L'
- D. size NOT (M OR L)

15. A problem that requires an algorithmic solution might be _____.

- A. satellite link expansion sequence
- B. to find the shortest possible route for traveling salesperson
- C. hotel room reservation problem
- D. markets for trading commodities such as agricultural products

16.

Number = Number - 2

The above instruction is _____.

- A. to increment the value of the variable number by 2.
- B. to decrement the value of the variable number by 2.
- C. to accumulate the value of the variable number by 2.
- D. to disperse the value of the variable Number by 2.

17. Counter-controlled loop variables _____.

- A. begin with initializing to a start value
- B. are evaluated in a boolean condition statement
- C. are incremented or decremented in the loop body
- D. all of the above

18. How many times is the string "Hello!" written on the screen?

```

LOOP: x = 1 TO 2 STEP 1
  LOOP: y = 1 TO 5 STEP 1
    DISPLAY "Hello!"
  LOOP-END: y
LOOP-END: x

```

- A. 5
- B. 10
- C. 15
- D. 50

19. When performing initial analysis of a problem that is not easily defined, you should concentrate first on which of the following?

- A. logic needed to solve the problem
- B. input needed
- C. output required
- D. processing requisite

20.

	IF $x < 5$
	THEN
T	$a = 6$
	ELSE
F	$a = 7$

Which of the following code segments has exactly the same effect as above IF/THEN/ELSE algorithm segments?

A.

	IF $x \geq 5$
	THEN
T	$a = 6$
	ELSE
F	$a = 7$

B.

	IF $x \leq 5$
	THEN
T	$a = 7$
	ELSE
F	$a = 6$

C.

	IF $x > 5$
	THEN
T	$a = 6$
	ELSE
F	$a = 7$

D.

	IF $x \geq 5$
	THEN
T	$a = 7$
	ELSE
F	$a = 6$

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

Question 1

- (a) Name and explain **TWO (2)** primary components of programming language. (6 marks)
- (b) Set up the truth table for the following logic:

$$X = A \text{ OR } B \text{ AND NOT } (B \text{ OR } C)$$

(8 marks)

- (c) A college will give power bank to new students every semester. The college offers 3 semesters in a year. One box of power bank contains 24 pieces. Design a program to request user enter the estimated number of student for the three semesters. Calculate and display the number of boxes of power bank the college has to buy. Build a Problem Analysis Chart (PAC) as a solution. (6 marks)

(Total: 20 marks)

Question 2

- (a) Define *logical structure* that support the structured programming language. Identify **FOUR (4)** types of logical structure. (6 marks)
- (b) Write the logic expression of the following statement:
- (i) X is greater than 10
 - (ii) Age is between 1 to 18 (inclusive 1 and 18)
 - (iii) Both Alpha and Omega are positive

(6 marks)

- (c) Design a solution to determine the cost of an automobile insurance premium based on number of accident that the driver had. The basic insurance charge is RM500. Additional surcharge if driver had automobile accidents based on below tables:

# of automobile accidents	Surcharge (RM)
1 – 2	150
3 – 5	325
6-7	460
8 and above	No entitle for insurance coverage
Others	Invalid

Present your answer in an algorithm.

(8 marks)

(Total: 20 marks)

Question 3

(a) Determine which of the following are valid? If invalid explain why.

- (i) `7eleven <> "711"`
- (ii) `9 * number = total`
- (iii) `Test >= 50`
- (iv) `While = 20`
- (v) `No_student = 0`

(10 marks)

(b) Identify and correct the syntax mistake(s) of the following algorithm segments:

```

1. Begin
2. Number = 1
3. Total = 0
4. While number =< 10
    Read month
    If month >0 and <13 then
        Case of month = 0
            < 1:   Display "January"
                  total + 1 = total
            2<3:  Display "February"
            Default: Display "Other months!"
        End-of-case
    otherwise
        Display "Invalid!"
    Number++
5. End
  
```

(10 marks)

(Total: 20 marks)

Question 4

(a) Rewrite the following algorithm in flowchart:

1. Begin
2. Sum = 0
3. Repeat
 - Read number
 - While number $\neq 0$
 - Remainder = number MOD 10
 - Sum = sum + remainder
 - Number = number / 10
 - Display number, remainder
 - While-end
 - Display sum
 - Read stop
 - Until stop = 1
4. End

(12 marks)

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

Write the *InputData* module to read radius of two circles.

Write the *CalcData* module to calculate the area of two circles respectively based on the radius of two circles.

Write the *FindBiggest* module to determine the biggest circle based on the radius of the respectively circle.

Write the *Output* module to display which circle is biggest and its respectively area calculated in CalData module.

(8 marks)

(Total: 20 marks)

~ The End ~

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