TED (10)–1018

(REVISION—2010)

Reg. No. ....

Signature ....

SECOND/THIRD SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY—OCTOBER, 2012

PROGRAMMING METHODOLOGY

(For IIIrd Semester CB and IInd Semester all branches except CP and CB)

[*Time* : 3 hours

(Maximum marks : 100)

Marks

PART—A

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Write the difference between character data type and string data type.

2. Write the outcome of the following relational expressions :

   if $x = 3$, $y = -3$, $z = 4$, $w = 3$

   (i) $x != z$

   (ii) $y <= w$.

3. Consider the following counter controlled loop :

   For ($k = 3$; $k <= 8$; $k + 2$)

   Write k

   End for

   (i) Write the name of the counter variable.

   (ii) Write the initial value, the increment and the final value of the counter.

4. Write the statements for storing 20 student's height in an array.

5. State advantage of data flow diagram. (5x2=10)

PART—B

II Answer *any five* questions. Each question carries 6 marks.

1. Suppose a program is to find the final (maturity) value of an investment. You will be given the amount invested, the rate of interest and the length of time that the money is invested.

   (i) Identify the data that must be input to this program.

   (ii) Give reasonable names and identify the data type for the all the required variables.

   (iii) Give Input and Write statements that prompt for and input the data for this problem.

[78]

Marks

2. A software company appointed a new programmer to make corrections and modifications in their existing software. But he found it difficult to understand the logic and conventions used by earlier programmer and had to spend a lot of time for this.

(i) In your opinion what could be the reason ?

(ii) Identify the solution for this.

(iii) Briefly explain the solutions.

3. Write a pseudocode that inputs a number *Number* and displays the word Correct if *Number* is between 0 and 100. This means *Number* must be both greater than 0 and less than 100.

4. Consider the following loop :

        Set Number = 2
        Repeat
            Write Number
            Set Number = Number – 1
        Until Number = = 0.

(i) Is it post-test loop or pre-test loop ?

(ii) List the statements inside the loop.

(iii) Identify the test condition for the loop.

(iv) Write the output.

(v) Predict the number of times the loop will be executed.

(vi) Predict the output if the line 'Set Number = Number – 1' is replaced with Set Number = Number + 1.

5. Write an algorithm that declares a two-dimensional array X of integers with 5 rows and 5 columns and inputs 25 integers into this array from the user.

6. In a programming language strings are implemented as array of characters and end of the string is denoted by # automatically by the programming language. The name of a person is stored in the system in two variables as First Name and Last Name separately. Write a pseudocode to combine these two name sections to a single variable.

7. Answer the following questions [questions (i) to (iii)] based on the following algorithm. (Assume that variables declared in main are global)

        Main
            Declare X, Y as Integer
            Set X = 1
            Set Y = 2
            Call Sub (X, Y)
            Write X
            Write Y

        End program.
        Subprogram Sub (Integer Num 1, Integer Num 2 as Ref)

            Declare X as Integer
            Set Num 1 = 3
            Set Num 2 = 4
            Set X = 5
            Write X.

        End Sub program.

(i) List the local and global variables in this pseudocode.

(ii) List the value and reference parameters in the sub program.

(iii) What is output of this program if code corresponding to this pseudocode is run ?

(5x6=30)

PART—C

(Answer *one* full question from each unit. Each question carries 15 marks.)

UNIT – I

III (a) Write an algorithm to read the number of days between two dates and to print the number of months and remaining days between these dates. (Assume 30 days to a month)   7

(b) Describe the difference between syntax errors and logical errors with suitable examples.   8

OR

IV (a) In exam grade percentage is calculated based on the highest score in the exam, ie, Grade percentage = Score/Highest score. Given the highest score, write an algorithm to read one students score, calculate and print the grade percentage.   6

(b) Draw flow chart for the above problem.   5

(c) List the phases in program development cycle.   4

UNIT – II

V (a) A palindrome number is the same when written both forward and backward, such as 23132. Write an algorithm to check whether a number is a palindrome.   9

(b) Explain CASE statement with suitable example.   6

OR

VI (a) In a factory, employees are paid on an hourly rate depending on their wage code given below :

Wage code	Hourly rate
A	100
B	150
C	250
Other	Display as Error

Write an algorithm to find the wage of an employee, where wage is calculated as No. of hours worked multiplied by hourly rate.   8

(b) Briefly explain hierarchy of arithmetic, relational and logical operations with examples.   7

UNIT – III

VII (a) An array contains the names of students. Write an algorithm to arrange them in alphabetical order.   9

(b) Write a program that searches an array of 100 names, Client, for the name "Ani". If the name is found, the program should display "Found"; if not, it should display "Not Found".   6

OR

VIII (a) The marks of 5 subjects of 55 students are given. Write an algorithm to read marks of 5 subjects of each student into an array and store the total mark at the end of the row after adding them. (Hint : Use a two dimensional array with 6 columns; row number indicates the student roll number). 10

(b) How many interchanges take place in sorting the number 3, 2, 1 in ascending order using a bubble sort ? Justify your answer. 5

UNIT – IV

IX (a) The factorial of a number N is the product of first N natural numbers. Write an algorithm to find factorial of given number using :

(i) Iterative method.

(ii) Recursive method.

(iii) Distinguish between iterative method and recursive method. 9

(b) With suitable example explain how values can be passed between a sub program and main program. 6

OR

X (a) Define function. Briefly describe about built in functions and user defined functions. 5

(b) An integer is said to be prime if it is divisible only by 1 and itself. For example, 2, 3, 5 and 7 are prime but 4, 6, 8 and 9 are not.

(i) Write a function that determines if a number is prime.

(ii) Using this function write a algorithm to print all the prime numbers between 1 and 1000. 10

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