TED (10)–1018

(REVISION—2010)

Reg. No...

Signature. ....

SECOND/THIRD SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY—OCTOBER, 2011

PROGRAMMING METHODOLOGY

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

[*Time* : 3 hours

(Maximum marks : 100)

PART—A

(Answer all questions. Each question carries 2 marks)

Marks

I (a) What (if anything) is wrong with each of the following variable names
    (i)   Sales Tax
    (ii)   1_2_3

(b) For the following pseudocode :

If Number > 0 Then
        Write "Yes"
End if
If Number = 0 Then
        Write "No"
End if
If Number < 0 Then
        Write "No"
End if

Write a single If-Then-Else structure that has the same effect as the given pseudocode.

(c) Set x = 1.23
Set y = "1.23"
State whether x and y are equal. Justify.

(d) How many integer values can be stored by declaring the following statement ? Justify.
Declare A[10. 20] as Integer.

(e) Write the different modes in which a file can be opened.   (5x2=10)

PART—B

(Answer any *five* questions. Each question carries 6 marks)

II 1. The statements in the following algorithm is not in correct order. Rearrange the statements to correct the algorithm.

    Input a, b
    Write "Enter two Numbers :"
    Declare a,b, c As Integers
    Set c=a+b
    Write Sum
    Write "The sum is"

[283]

2. As per the foreign exchange rates

   1 U.S dollar = 46 Indian Rupees

   1 British Pound = 2.5 U.S. dollar

   Write an algorithm to read the amount in rupees and print equivalent U.S dollar and British pound.

3. Write pseudocode that inputs a number. If number is not negative, it computes and displays its square root. If number is negative, it displays a message indicating the square root is not defined.

4. Suppose there are 53 students in your class :

   (i) Write a pseudocode to find the average of the grade points obtained by each student.

   (ii) Modify the above code to use the same code for calculating other classes also.

   (Note : A student will get a value between 1 and 10 as grade point which is corrected to 2 decimal points).

5. Write a pseudocode that input numbers terminated by 0 in ascending order and display it in descending order.

6. Predict the output of the following pseudocode :

```
Declare Q[10, 10] as Integer
Declare R, C As Integer
For (R=1; R<3; R++)
        For (C = 1; C<=3; C++)
        If R == C Then
                Set Q[R, C] = 1
        Else
                Set Q[R, C] = 0
                End If
        End for (c)
End for (R)
For (R=1; R<3; R++)
        For (C = 1; C<=3; C++)
        Write Q[R, C]
        End for (C)
End for (R).
```

7. The factorial of a number, say N (N!) is the product of first N natural numbers. Thus 5! = 5 x 4!, 4! = 4 x 3!, 3! = 3 x 2!, 2! = 2 x 1!, finally 1! = 1.

   (i) Identify the suitable technique to find the factorial in this fashion.

   (ii) Write a function to implement this technique.

   (iii) Explain the working of the function by giving 4 as input. (5x6=30)

PART—C

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

UNIT—I

III (a) Write a pseudocode to compute and display an investment's total interest (I) and final value (FV) when the user inputs the original amount invested (P), rate of interest (R, as a decimal), and number of years invested (T). Use the formulas and be sure to specify the data types of the variables :

$I = P * R * T$ and

$FV = P + I$ 8

(b) Draw the flowchart for the above pseudocode.   7

OR

IV (a) The manager of a super market would like to be able to compute the unit price for products sold there. To do this the program should input the name and price of an item and its weight in kilogram and gram. Then it should determine and display the unit price (the price per gram) of the item.   8

(b) Explain the steps of problem solving.   7

UNIT—II

V (a) Input a number X and find the area (Area) of each of the following :

- A square with side X, Area = X^2
- A circle with radius X, Area = $3.14 * X^2$
- An equilateral triangle with side X, Area = $\sqrt{(3/4)} * X^2$

Note : Because X represents a dimension, it is required that X>0. Be sure to include this in the program.   9

(b) Write algorithm that input Number; then display "Yes" if Number = 1, displays "No" if Number = 2, and display "Maybe" if Number = 3. Implement using :

(i) A sequence of if-Then statements.

(ii) A case statement.   6

OR

VI (a) Consider the equation $AX^2 + B = 0$.

- If B/A<0, this equation has two solutions. The solutions are

  (i) $X1 = \sqrt{(-B/A)}$

  (ii) $X2 = -\sqrt{(-B/A)}$

- If B/A = 0, this equation has one solution which is X = 0.
- If B/A > 0, this equation has no real number solutions.

Write a code to have user input any number for the coefficients, A and B, for this equation. If A = 0, terminate the code. Otherwise, solve the equation.   9

(b) Write a solution to tell the user whether a number is a palindrome number. (*Hint*: A palindrome is a number that is the same written both forward and backward such as 81318)   6

Marks

UNIT—III

VII (a) Write an algorithm to count the even numbers in an array. 7

(b) A list contains the names of students in a class. Write an algorithm to make the list in alphabetical order to make attendance roll. 8

OR

VIII (a) A school records the marks of students in an array named 'Marks'. Determine the maximum mark in the array. 8

(b) Write an algorithm to find the sum of elements of first row of a matrix. 7

UNIT—IV

IX (a) Write an algorithm to input a list of positive integers into an array, find the average of numbers in the array, and output the result. Use a sub-program to input the numbers in the array, a function to find the average, and sub-program to output the result. 9

(b) Write the steps to modify the contents of a sequential file. 6

OR

X (a) Write an algorithm to find the grades of n students whose total marks are given. Use separate function to calculate grade from the total marks and return the grade. The reading of total marks and displaying grades should be done in the main program. Calculation of the grades can be done as follows :

If marks > = 90 grade is S, marks > = 75 grade is A, marks > = 60 grade is B, marks > = 40 grade C, otherwise grade F. 10

(b) Explain recursion with an example. 5

———————