

Total No. of Questions—12]

[Total No. of Printed Pages—6

[3762]-202

S.E. (Computer Engg.) (First Semester) EXAMINATION, 2010

PROGRAMMING AND PROBLEM SOLVING

(2008 COURSE)

Time : Three Hours

Maximum Marks : 100

- N.B. :— (i) Answer any *three* questions from each section.
(ii) Answer to the two sections should be written in separate-books.
(iii) Neat diagrams must be drawn wherever necessary.
(iv) Figures to the right indicate full marks.
(v) Assume suitable data, if necessary.

Section I

1. (a) State a reason why each of the six Problem-Solving steps is important in developing the best solution for a problem. Give one reason for each step. [8]
(b) Draw Interactivity chart and IPO chart to solve mathematical quadratic equation. [8]

Or

2. (a) Define a function. Mention various categories of functions. Explain at least two functions from each category with suitable example. [8]

P.T.O.

(b) What do you mean by Flowchart ? Give the meaning of each symbol used in flowchart. Draw a flowchart to compute sum of elements from a given integer array. [8]

3. (a) An electricity board charges the following rates for the use of electricity : [12]

For the first 200 units : 80 P per unit

For the first 100 units : 90 P per unit

Beyond 300 units : Rs. 1.00 per unit

All users are charged a minimum of Rs. 100 as meter charge.

If the total amount is more than Rs. 400, then an additional surcharge of 15% of total amount is charged. Complete the six problem-solving steps to read the names of users and number of units consumed and print out the charges with names.

(b) What are the two ways of send data from one module to another through the use of parameters with suitable example ? [6]

Or

4. (a) Using first positive and then negative logic, write the algorithm and draw the flow charts for the following set of conditions : [12]

$R = 50$ for $S < 1000$

$R = 100$ for $S = 1001-4000$

$R = 250$ for $S = 4001-8000$

$R = 75$ for $S > 800$

(b) Explain in brief about Decision table using suitable example. [6]

5. (a) Implement the Fibonacci algorithm function that accepts as input two consecutive Fibonacci numbers and returns as output the next Fibonacci number. [8]

(b) Given a number m , devise Pseudo-algorithm to compute its square root. [8]

Or

6. (a) Design Pseudo-algorithm to check given non-negative integer number is Palindrome or not. [8]

(b) Given some integer x , compute the value x^n where n is positive integer which is greater than 1. [8]

Section II

7. (a) Write Pseudo-algorithm to find minimum, maximum elements and how many times they both occur in an array of n elements. [8]

- (b) Write Pseudo-algorithm for partition the elements of array into two subset such that elements $\leq x$ are in one subset and elements $>x$ are in other subset. [8]

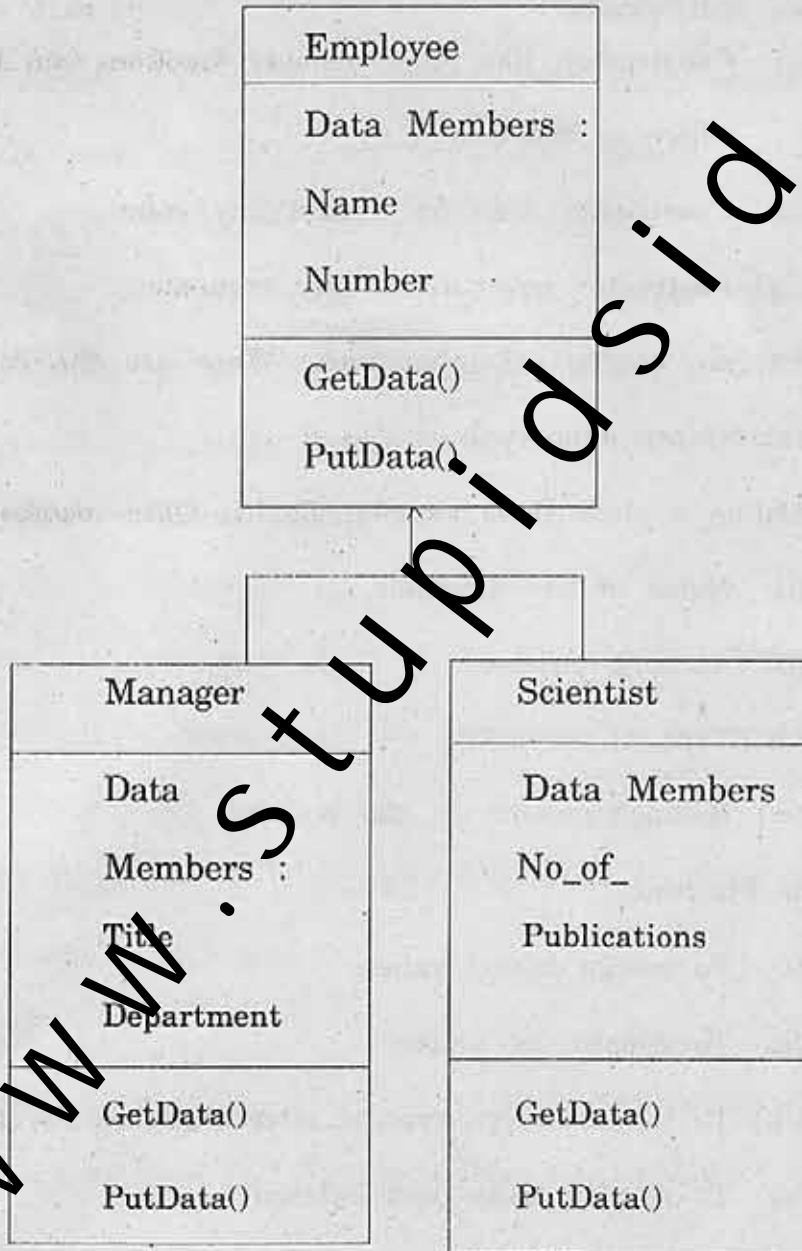
Or

8. (a) Write Pseudo-algorithm to rearrange the elements in an array so that they appear in reverse order. [8]
- (b) (i) Write Pseudo-algorithm to find position of number x in array of n elements. [4]
- (ii) Write short note on multidimensional array. [4]
9. (a) Explain algorithm for text line length adjustment. [8]
- (b) (i) Explain *part* of algorithm for calculating number of spaces needs to be added in line for left and right justification of text. [4]
- (ii) Write Pseudo-algorithm to count number of characters in each line. [4]

Or

10. (a) Explain the algorithm to count number of times pattern occurs in the text. [8]
- (b) Explain algorithm for line editing. [8]

11. (a) Explain essential characteristics of an object oriented programming language. [4]
- (b) Explain public, private and protected access specifier. [2]
- (c) Write a C++ program to add two complex numbers. [5]
- (d) Write C++ program for following inheritance diagram. [6]



Or

12. (a) Explain advantages and disadvantages of object oriented programming language. [4]
- (b) State whether the following statements are *TRUE* or *FALSE*. Justify answer. [3]
- (i) Constructor, like other member functions can be declared anywhere in the class.
 - (ii) Constructor does not return any value.
 - (iii) Destructor never takes any arguments.
- (c) Explain concept of inheritance. What are the different types of inheritance supported in C++ ? [5]
- (d) Define a class Bank Account having Data members : [6]
- (i) Name of the depositor
 - (ii) Account number
 - (iii) Type of account
 - (iv) Balance amount in the account.

Member Functions :

- (i) To assign initial values
- (ii) To deposit an amount
- (iii) To withdraw an amount after checking the balance
- (iv) To display name and balance

Write a main program to test the program for 'n' depositors.