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Total No. of Questions—12]

[Total No. of Printed Pages—4+2

[3962]-202**S.E. (Computer) (I Sem.) EXAMINATION, 2011****PROGRAMMING AND PROBLEM SOLVING****(2008 PATTERN)****Time : Three Hours****Maximum Marks : 100**

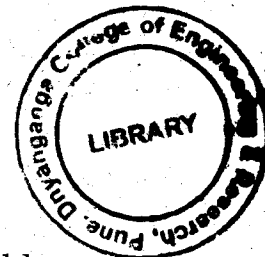
- N.B. :—**
- (i) Answer any *three* questions from each Section.
 - (ii) Answers to the two Sections should be written in separate answer-books.
 - (iii) Neat diagrams must be drawn wherever necessary.
 - (iv) Figures to the right indicate full marks.
 - (v) Assume suitable data, if necessary.

SECTION I

1. (a) Describe the six steps in problem solving with suitable example. [8]
- (b) Write short notes on the following with examples : [8]
 - (i) Internal documentation and external documentation
 - (ii) PAC Chart.

Or

2. (a) Write short notes on the following : [8]
 - (i) Rules for naming and using variable
 - (ii) Logical and Relational operator.



P.T.O.

- (b) What is a difference between Flowchart and Algorithm ?
Convert the algorithm for computing factorial of given number into flowchart. [8]

3. (a) A bank offers interests on fixed deposits as follows. Complete the seven steps of solution development to calculate interests. [12]

Rate	Time
4.5%	≤ 45 days
5%	≤ 3 months
6%	≤ 6 months
7%	≤ 1 year
8.5%	≤ 3 years
9%	> 3 years

- (b) Define Data Dictionary. Build data dictionary for calculating compound interest for given principal amount, number of years and rate of interest. [6]

Or

4. (a) Using positive logic, solve the following set of conditions to calculate Hotel bill : [12]

- (i) Sale of eatables up to 100 ₹, 11% discount
- (ii) Sale of eatables up to 1000 ₹, 22% discount
- (iii) Sale of eatables up to 100 ₹, 33% discount

And, also convert above positive logic to negative logic.

- (b) Draw a decision table for the following scenario; No charges are reimbursed to the patient until the deductible has been met. After the deductible has been met, reimburse 50% for Doctor's Office visits or 80% for Hospital visits. [6]

5. (a) Design an algorithm that reads in a set of n single digits and converts them into a single decimal integer. For e.g. algorithm should convert the set of 4 digits {4, 6, 7, 1} to the integer 4671. [8]

- (b) Design an algorithm to find all common prime divisors of two numbers. [8]

Or

6. (a) Design an algorithm to compute the harmonic mean of n data values. The Harmonic mean defined by :

$$H = n / \sum_{i=1}^n (1/a_i) \quad [8]$$

- (b) Explain in brief Algorithm Development to compute the value of X^n where n is positive integer which is greater than 1 and X is given integer. [8]

SECTION II

7. (a) Given a set of n students exam marks (in the range 0 to 100) make a count of the number of students that obtained each of the following class :

Distinction : more than 64.

First class : more than 59 marks.

Second class : more than 39 marks.

Higher second class : more than 54 marks. [8]

- (b) What is table lookup technique ? Explain any searching method that can be used for table lookup. [6]
- (c) Write Pseudo-algorithm for finding an average of array element. [4]

Or

8. (a) Write Pseudo-algorithm for partition the elements of array into two subsets such that elements $\leq x$ are in one subset and elements $> x$ are in other subset. [8]
- (b) Write Pseudo-algorithm that places the k th element of an array in position 1, the $(k + 1)$ th element in position 2 etc. The original 1st element is placed at $(n - k + 1)$ and so on. [6]
- (c) What is frequency distribution ? Explain with example. [4]

9. (a) Explain sublinear pattern search algorithm. [8]
- (b) Write the following Pseudo-algorithm :
- (i) To set up partial match table in linear pattern search
- (ii) To insert given new pattern at the given position in the text. [8]

Or

10. (a) Explain the algorithm that prints a list of all words in the text that contain the search word as a prefix. [8]
- (b) Explain algorithm to that will adjustment the length of line of text so that no lines more than n characters are printed and no word should extends across two lines. [8]
11. (a) Write differences between C and C++ language. [4]
- (b) Write a C++ program to add two polynomials. [4]
- (c) Explain the following concepts : [8]
- (i) Parameterized constructor
- (ii) Constructor overloading
- (iii) Destructor
- (iv) Copy constructor.

Or

12. (a) Explain with example a hybrid inheritance. [4]

(b) Write difference between : [4]

(i) Public and Private access Specifier

(ii) Public and Protected access Specifier.

(c) Create two classes DM and DB which store the value of distances. DM stores distance in meters and centimetres and DB in feet and inches. Write a C++ program that can read values for the class objects and add one object of DM with another object of DB.

The display should be in the format of feet and inches or meters and centimetres.

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[Hint : Use friend function]

[8]