S.E. (Computer Engineering) (First Semester)

EXAMINATION, 2015

PROGRAMMING AND PROBLEM SOLVING

(2008 PATTERN)

Time : Three Hours   Maximum Marks : 100

N.B. :— (i) Answer any *three* questions from each Section.

(ii) Answer **3** questions from Section I and **3** questions from Section II.

(iii) Answers to the two Sections should be written in separate answer-books.

(iv) Neat diagrams must be drawn wherever necessary.

(v) Figures to the right indicate full marks.

(vi) Assume suitable data, if necessary.

SECTION I

1. (a) Define the data types of the following data items. Justify your answer :   [6]

(i) Sum of Money

(ii) Telephone number

(iii) Zip code.

P.T.O.

(*b*)   Evlauate for A=5, B=3 and C=2   [6]

   (*i*)   F=A*C\(A+C)

   (*ii*) F=3*B/A^2

   (*iii*) F=(C*(B+3*A)+5*A)/C.

(*c*)   Compare an algorithmic solutions and heuristic solutions. Support your answer with the suitable example.   [4]

Or

2.   (*a*)   The railway ticket reservation system (Single Counter) is to be computerized. Prepare solution to this using the following tools :   [8]

   (*i*)   IPO chart

   (*ii*) Problem analysis chart

   (*iii*) Interactivity chart

   (*iv*) Algorithms.

(*b*)   Define a function. Mention various categoires of functions. Explain at least *two* functions from each cateogry with suitable example.   [8]

3.   (*a*)   What are the major types of modules ? Explain the term coupling and cohesion related to module.   [6]

(*b*)   What are different parameters passing methods ? Explain each method with the suitable example.   [6]

(c) Using negative logic, write the algorithms and draw the flowcharts for the following set of conditions : [6]

R = 50 for S < = 1000

R = 100 for S = 1001 – 4000

R = 250 for S = 4001 – 8000

R = 75 for S > 8000

Or

4. *(a)* Make a decision table and draw a flowchart for the following set of conditions : [8]

Gross Income   Tax Rate

Gross < = 5000   5%

5000 – 10000   8%

10000 – 15000   10%

Gross > 15000   15%

(b) Explain concept of local variables and global variables with suitable example. [4]

(c) Explain decision tables in detail with example. [6]

5. *(a)* Design and explain an algorithm for GCD of two integers with suitable example. [8]

(b) Design and explain an algorithm for square root of a given number with suitable example. [8]

Or

6. (*a*) Design an algorithm that converts binary numbers to hexadecimal. [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 a pseudo algorithm for partition a randomly ordered array of *n* elements into two subsets such that elements less than equal to X are in one subset and elements are greater than X are in other subset. [8]

(*b*) Write short notes on : [8]

(*i*) Pointer technique

(*ii*) Table look up technique.

Or

8. (*a*) Write an algorithm for searching a number in an array using binary search technique. [8]

(*b*) Write a pseudo algorithm to find the sum of rows, sum of columns, and sum of major diagonal of a square matrix N*N. Explain with suitable example [8]

9. *(a)* Write a pseudo algorithm for text length adjustment. Explain it. [4]

(b) Write and explain an algorithm for left and right justification for text. [6]

(c) Explain algorithm for line editing. [6]

Or

10. *(a)* Write pseudo algorithm for linear pattern search. [8]

(b) Explain the following algorithm : [8]

    (i) Count number of spaces on each line for given text.

    (ii) Search keyword from given text.

11. *(a)* What do you mean by polymorphism ? Explain with suitable example. [6]

(b) Explain visibility modes in C++. [4]

(c) Explain multiple inheritance. Elaborate your answer with suitable example. [4]

(d) What is the advantage of encapsulation in object oriented program ? Explain with a suitable example. [4]

Or

12. *(a)* Compare procedural language and object oriented language for solving problems. What are their advantages and disadvantages ? [8]

(b) Explain concept of inheritance. What are the different types of inheritance supported in C++ ? [4]

(c) 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.