

Total No. of Questions—12]

[Total No. of Printed Pages—4+2

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[4757]-182

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) Evaluate 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 categories of functions. Explain at least *two* functions from each category 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.