Total No. of Questions—**12**] [Total No. of Printed Pages—**4**

Seat No.	

[4857]-202

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 Section I and *three* questions from Section II.

(*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*) Write a short note on Top down design. [6]

(*b*) Develop a flow chart for the instructions for withdrawing money from an ATM machine. Be sure to include all steps such as card validation. [8]

(*c*) State and explain any *four* difficulties with problem solving. [4]

Or

2. (*a*) 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]

P.T.O.

(*b*) Evaluate for P = true, Q = true, R = false, S = false : [4]

(*i*) A = (P AND Q) OR R

(*ii*) A = Q OR S AND P

(*iii*) A = NOT P OR NOT Q AND S

(*iv*) A = P AND NOT R OR NOT S.

(*c*) What is function ? Explain any *two* types of functions. [6]

3. (*a*) What do you mean by cohesion and coupling ? How are these important to programmers ? [6]

(*b*) Take three integers and find the minimum integer among three. Create a decision table to solve this problem. [4]

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

Or

4. (*a*) Using first positive and then negative logic, write the algorithm and draw flowcharts 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*) Name the major types of modules and explain their function. [4]

5. (*a*) Design an algorithm that for the integers in the range 1 to 100 finds the number that has the most divisors. [8]

(*b*) Design an algorithm for exchanging values of two variables. Explain *one* application in detail in which we use this algorithm. [8]

Or

6. (*a*) Design pseudo algorithm that converts binary numbers to octal. [8]

(*b*) Given an integer *n* devise pseudo algorithm that will find its smallest exact divisor other than one. [8]

SECTION II

7. (*a*) Write a pseudo algorithm for removal of duplicates from an ordered array. [8]

(*b*) Design an algorithm to find the second largest value in an array of *n* elements. [8]

Or

8. (*a*) Design an algorithm to search an integer number from an array of 'N' elements. Use binary search. [8]

(*b*) Write pseudo algorithm to rearrange the elements in an array so that they appear in reverse order. [8]

9. (*a*) Explain algorithm for text line length adjustment. [8]

(*b*) Explain algorithm for left right justification of given text. [8]

Or

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

(*b*) Design and implement an algorithm that reverses the justification process by removing multiple blanks. Paragraph indentations should be preserved. [8]

11. (*a*) Write a C++ program, to find the average of five numbers. [6]

(*b*) Explain essential characteristics of an object oriented programming language. [4]

(*c*) Write a program in C++ for a Video CD library that need to track customers, Video CD's and its rentals and late fees : [8]

(*i*) Design classes you would create the application.

(*ii*) Write what methods would be needed for the classes.

(*iii*) Print the customer and its rentals.

Or

12. (*a*) Explain the following concepts : [8]

(*i*) Parameterized constructors

(*ii*) Copy constructor

(*iii*) Destructor

(*iv*) Encapsulation and Data Abstraction.

(*b*) Explain with a suitable example how code reusability is achieved in C++. [6]

(*c*) Explain the following terms : [4]

(*i*) Access specifier

(*ii*) Static member functions.