

Total No. of Questions—12]

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[4957]-202

S.E. (Comp. Engg.) (First Semester) EXAMINATION, 2016

PROGRAMMING AND PROBLEM SOLVING

(2008 PATTERN)

Time : Three Hours

Maximum Marks : 50

- N.B. :—**
- (i) Answer any *three* questions from each Section.
 - (ii) Answer three questions from Section I and *three* 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 side indicate full marks.
 - (vi) Assume suitable data, if necessary.

SECTION I

1. (a) Write a short note on top-down design. [6]
- (b) Develop a flowchart 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]

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- (b) Evaluate for $P = \text{true}$, $Q = \text{true}$, $R = \text{false}$, $S = \text{false}$: [4]
- (i) $A = (P \text{ AND } Q) \text{ OR } R$
 - (ii) $A = Q \text{ OR } S \text{ AND } P$
 - (iii) $A = \text{NOT } P \text{ OR } \text{NOT } Q \text{ AND } S$
 - (iv) $A = P \text{ AND } \text{NOT } R \text{ OR } \text{NOT } S$
- (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 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) 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) Give 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 to 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.