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B.Tech I Year I Semester (R19) Regular Examinations January 2020

PROBLEM SOLVING & PROGRAMMING

(Common to all branches)

Max. Marks: 70

Time: 3 hours

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
 - (a) What is a compiler? Give an example.
 - (b) Write an algorithm for finding the area of a given square.
 - (c) List the important steps in solving a problem.
 - (d) Give an example showing how redundant computations make an algorithm inefficient.
 - (e) What is type conversion? Give an example.
 - (f) Illustrate the use of break in loop statements with an example.
 - (g) What is a command line argument? How do you pass a command line arguments to a C-program?
 - (h) Let int $a[5] = \{ 1, 3, 5, 7, 9 \}$. What is the value output of:

printf("%d", *(a+2)). Justify your answer.

- (i) What is the use of typedef in C? Give an example.
- (j) What are bit-fields? Give an example.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) Explain in detail about the working of a computer.
 - (b) Write an algorithm to compute the roots of given quadratic equation.

OR

3 Explain in detail about the strategy for designing algorithms with suitable examples wherever necessary.

UNIT – II

- 4 (a) Explain the top-down approach for problem solving.
 - (b) How do you measure the efficiency of an algorithm? Explain with an example.

OR

- 5 (a) Design an algorithm that reads a set of numbers from the user and makes a count of the number of negative and the number of non-negative members in the set.
 - (b) Write an algorithm for computing the sum of all even numbers in the range 1 to n (including both 1 an n). Trace you algorithm for n = 10.

UNIT – III

6 Explain in detail about the arithmetic, relational and logical operators in C with suitable examples.

OR

- 7 (a) What is function? What are the advantages of using functions in a C-program? Write C-function for exchanging the values of two given variables.
 - (b) Write a C-program for computing the sum of first n terms of the following series using for loop. $S = 1 - 3 + 7 - 9 + 11 - 13 + \dots$ 'n' terms.

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UNIT – IV

8 Design and write algorithm for finding the square root of a given integer. Trace your algorithm for input value 16.

OR

- 9 (a) What is a pointer and pointer to a pointer? Illustrate the declaration and use of pointers and pointer to a pointer in C with suitable example program.
 - (b) Write an algorithm for reversing the array elements. Trace your algorithm for the following array of size 10.

 $a[10] = \{ 12, 3, 4, 48, 87, 54, 67, 43, 78, 19 \}$

10 Design and write an algorithm to sort a given set of randomly ordered integers into non-descending order using insertion method. Trace your algorithm for the following list of integers. 78 43 9 2 12 45 98 22

OR

11 (a) Explain the difference between structures and unions with the help of a C-program.

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(b) Illustrate the passing of structures to functions through an example.