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Question Paper Code : 53552

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Second Semester
Computer Science and Engineering
CS 6202 – PROGRAMMING AND DATA STRUCTURES – I
(Common to Information Technology)
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What is an entry-controlled loop ? Give example.
2. Give example for a function prototype in C language.
3. What is a pointer ? Give example.
4. Write the syntax for opening a data file in C language.
5. What is a linear data structure ? Give example.
6. List the advantages and disadvantages of linked list.
7. What is a circular queue ? Give diagrammatic illustration.
8. Outline the applications of stack.
9. How linear search works ?
10. What is a hash function ? Give example.

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PART - B

(5×16=80 Marks)

11. a) i) Write a C program to perform computation of $\sin(x)$ as given below :

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} \dots \dots N \text{ terms.} \quad (8)$$

- ii) Write a C program to sort an array of 'n' numbers in ascending order. (8)

(OR)

- b) Write a C function using pointers to add two matrices and return the resultant matrix to the calling function. (16)

12. a) i) Explain structures and unions in C language with an example. (8)

- ii) Write a C program to read the contents of a data file and display them on the screen. (8)

(OR)

- b) A file with name DATA contains a series of integer numbers. Write a C program to read these numbers and then write all prime numbers to a file called PRIME and all non-prime numbers to a file called NPRIME. (16)

13. a) i) Give an example for representing a polynomial using linked list. (4)

- ii) Explain with an algorithm and an example for adding polynomials using a linked list representation. (12)

(OR)

- b) Explain with an algorithm and an example, the operations that can be performed on a doubly-linked list. (16)

14. a) Present the algorithm for evaluation of a postfix expression using stack. Verify the correctness of the algorithm you have presented with an example. (16)

(OR)

- b) Explain with an algorithm and an example the operations that can be performed on a double ended queue. (16)

15. a) Present the quick sort algorithm for sorting a list of n numbers in ascending order. Verify the correctness of the algorithm you have presented with the following data set :

313, 99, 151, 12, 16, 17, 3, 19, 231, 221, 321, 441, 55, 77, 66, 11, 111 and 222.

Illustrate each step in the sorting process. (16)

(OR)

- b) i) Present the binary search algorithm and verify the correctness of the algorithm you have presented with an example. (8)

- ii) Write detailed notes on (i) Separate Chaining (ii) Rehashing. (8)