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B.E / B.Tech (Full Time) DEGREE ARREAR EXAMINATIONS, APR / MAY 2013
(Common to Computer Science and Engineering & Information Technology Branches)
Second Semester

CS9151 Programming & Data Structures - I

(Regulation 2008)

Time : 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Brief on the rules to follow on naming variables.

2. Write the output of the following code:

```
#include <stdio.h>
int func()
{
    static int a = 10;
    return a++;
}
main()
{
    printf("\nFirst call : %d", func());
    printf("\nSecond call : %d", func());
    return 0;
}
```

3. What are the advantages of preprocessors?

4. Write a code snippet that reads the elements of a n x m matrix using a pointer variable.

5. Is linked list is better than an arrayed list? Give atleast two reasons for your answer.

6. Give the postfix notation of the expression: $a ^ ((b * c + d) / (e - f * g))$.

7. What are binary search trees? Give an example.

8. Define rehashing.

9. What are min-heap and max-heap?

10. Sort the following numbers using Insertion sort.

9 5 2 3 26 1 4 53 46 8 17

Part – B (5 x 16 = 80 marks)

11. i) Write a function to reverse a string and use this function to check whether the user given string is a palindrome. (10)

ii) What are the components of a recursive function? Give a recursive function to find a factorial of a number. (6)

12. a) Write a program to store the voter's information such as voter-id, name, father name, date-of-birth, age, gender, address and ward-no for 'n' voters. Also write functions - to compute the number of male and female voters of a ward 'w'; - to display the information of each voter using *pointer*. (16)

OR

- b) Write a program to create a file; read and display the contents of the file; inserting a string at position 'n' from the end of the file and finally displaying the whole content of the file. (16)

13. a) i) Define C functions to evaluate a postfix expression using stack operations. (8)
ii) Given two sorted linear linked lists L1 and L2, how do you create a list L3, which consists of the uncommon elements of L1 and L2? Write a suitable ADT for the construction of doubly linked list L3. (8)

OR

- b) i) Write ADTs for insert and delete operations in a Circular Queue using singly linked list. (8)
ii) Write a C program to convert an infix expression into a prefix expression (8)

14. a) i) Write suitable ADT's to perform insertion and deletion operations in Binary Search Tree. (8)
ii) Simulate the result of inserting: 61, 32, 36, 14, 6, 75, 82, 3, 19, 87, 94 one at a time, into an initially empty binary search tree. (4)
iii) Simulate the deletion of the elements 36, 87, 61, 75 one by one from the above binary search tree. (4)

OR

- b) Explain the collision resolving schemes in hashing with proper illustrations. (16)

15. a) i) Explain Heap sorting of data with suitable example. (10)
ii) Arrange the following numbers in ascending order using Merge Sort.
49 58 25 63 4 14 78 96 8 10 2 43 (6)

OR

- b) i) Explain Quick Sort in detail by arranging the following set of numbers. Write suitable routines to illustrate Quick sort operations.
56 67 20 98 134 142 69 34 12 46 52 (10)
ii) Explain Replacement Selection algorithm with a suitable example. (6)