BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT
YELAHANKA – BANGALORE - 64
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

18CS32- Data Structures

MODULE-1 Question Bank

1. Define Data structures, Give its classifications (Jan 2018) (6 M)
2. Define structures with examples (Jan 2018) (4 M)
3. Define pointers, Give advantages and disadvantages of pointers (Jan 2018) (6 M)
4. Write a program to i) reverse a string ii) concatenate two strings (Jan 2018) (8M)
5. Explain dynamic memory allocation in detail (Jan 2018) (8 M)
6. Define Data structure, List and explain data structures operation (Jan 2019) (5 M)
7. Write the bubble sort algorithm (Jan 2019) (5 M)
8. List and explain in detail three types of structures used to store the strings (Jan 2019) (10 M)
9. Explain dynamic memory allocation (Jan 2019) (5 M)
10. Explain about representation of two-dimensional array in memory (Jan 2019) (5 M)
11. What do you mean by string matching? Let P and T be the strings with length R and S respectively and are stored as arrays with one character per element. Write a pattern matching algorithm that finds index P in T. Also discuss about the algorithm(Jan 2019) (10M)
12. What is an algorithm? Explain the criteria that an algorithm must satisfy(Jan 2017) (8 M)
13. Write the function to sort integers using selection sort algorithm (Jan 2017) (4 M)
14. Consider two polynomials (Jan 2017) (4M)

    $A(X)= 4X^{15}+3X^4+5$ and $B(X)=x^4+10x^2+1$

    Show diagrammatically how these polynomials can be stored in a 1-D array. Also give its C representation
15. Write the knuth morries pratt pattern matching algorithm and apply the same to search the pattern abcdabcy in the text abcxabcdabxabcdabcdabcy (Jan 2017) (8 M)
16. Write the fast transpose algorithm to transpose the given sparse matrix. Express the given sparse matrix as triplets and find its transpose(Jan 2017) (8 M)

$$A = \begin{bmatrix} 10 & 0 & 0 & 25 & 0 \\ 0 & 23 & 0 & 0 & 45 \\ 0 & 0 & 0 & 0 & 32 \\ 42 & 0 & 0 & 31 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 30 & 0 & 0 \end{bmatrix}$$

17. Write a c program with an appropriate structure definition and variable declaration to read and display information about 5 employees using nested structures. Consider the following fields like Ename, Empid, DOJ (Date,Month,Year)and Salary (Basic, DA, HRA). (July 2017) (8 M)

18. Give ADT of sparse matrix and show with a suitable examples sparse matrix representation storing as triplets. Give a sample transpose function to transpose sparse matrix (July 2017) (8 M)
19. What is a polynomial? what is the degree of the polynomial? Write a function to add two polynomials (July 2017) (8 M)
20. List and explain the functions supported by C for dynamic memory allocation (July 2017) (4 M)
21. Write a c program to concatenate Fname and Lname of a person without using any library function (July 2017) (4 M)
22. Differentiate between structures and unions (July 2018) (4 M)
23. Explain with example i) Insertion and ii) deletion in an array (July 2018) (8 M)
24. Suppose each student in a class of 25 students is given 4 tests, assume the students are numbered from 1 to 25, and the test score assigned in the 25X4 matrix called SCORE. Suppose Base (SCORE)=200, w=4 and the programming language uses row=major order to store this 2D array, then find the address of 3^{rd} test of 12^{th} student that is SCORE (12,3). (July 2018)(4 M)
25. List and explain any 4 functions supported in C for dynamic memory allocation with examples (July 2018) (8 M)
26. Consider two polynomials . With a diagram show that these polynomials are stored in a 1D array (July 2018) (2 M)
27. With an example illustrate that product of 2 matrices may not be sparse. Also write a C function for matrix multiplication of 2 sparse matrices (July 2018) (6 M)