100705

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GS-386

II Semester B.Sc./B.A. Examination, May/June - 2019

COMPUTER SCIENCE - II

Data Structures
(F+R) (CBCS) (2014-15 & Onwards)

Time : 3 Hours | Max. Marks : 70

Instructions : *Answer all the Sections.*

SECTION - A

Answer **any ten** questions. Each question carries **two** marks. **10x2=20**

1. Name any two linear and non-linear data structures.
2. What is space complexity ?
3. List the operations that can be performed on an array.
4. What is Dynamic memory allocation ? Mention the different function for the same.
5. What is queue ?
6. What are overflow and underflow of stack ?
7. What is recursion ?
8. What is sorting ? Mention the advantages of insertion sort.
9. What are the applications of stacks ?
10. What are Binary Trees ?
11. Write the following expression is postfix notation : P * (q + r) / s
12. Name any two areas where graph data structures are used.

SECTION - B

Answer **any 5** questions. Each question carries **10** Marks. **5x10=50**

13. (a) What are data structures ? Discuss in detail the various operations on data structure. **6**
    (b) Explain Asymptotic notations. **4**

P.T.O.

14. (a) Write a menu driven program to reverse and concatenation of strings. 5
    (b) Write a program to search an element using Binary search. 5

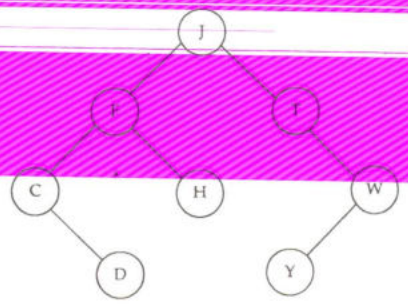
15. Write a program to sort N elements using Bubble sort. Show with an example, how the steps are implemented in the program, for the following list of numbers. 64 20 5 18 70 10. 10

16. (a) What is a linked list ? What are the types of linked lists ? Explain using a diagram. 5
    (b) Write an algorithm to insert an element at a given position in a linked list. 5

17. (a) What are stacks ? Explain using an example the various operations on a stack. 5
    (b) Write an algorithm to delete an element from a Linear queue data structure. 5

18. (a) Write a program to solve Towers of Hannoi problem using recursion. 5
    (b) What is a binary tree ? Discuss its properties. 5

19. (a) Traverse the below tree in pre-order, inorder and postorder. 3



    (b) Write a program to implement circular queue. 7

20. (a) Write an algorithm to illustrate a depth first search algorithm. 6
    (b) Define any 2 : 4
        (i) Degree of a vertex
        (ii) Priority Queue
        (iii) Sparce Matrix

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